

# List of tree diagrams implementing the $d = 13$ neutrino mass operator $LLHH(HH^*)^4$

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In the paper “*High-dimensional neutrino masses*” (arXiv:180A.AAAAA [hep-ph]) we considered all possible tree-level realizations of the neutrino mass operators  $LLHH(HH^*)^{(d-5)/2}$  with  $d = 9, 11, 13$ . For  $d = 13$ , there are 4199 diagrams organized in 576 different topologies, which are listed here.

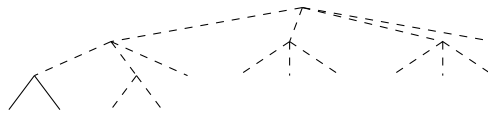
## Topology 1



## Topology 2



## Topology 3



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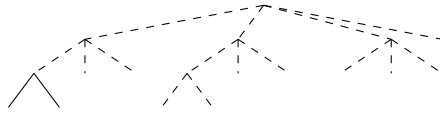
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‡Electronic address: [o.castillo.felisola@gmail.com](mailto:o.castillo.felisola@gmail.com)

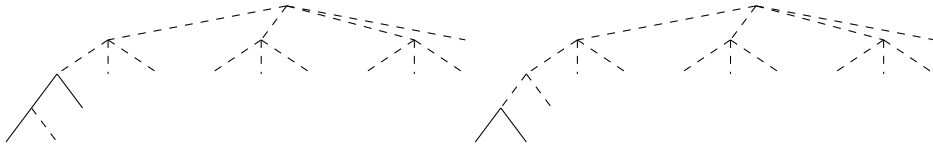
§Electronic address: [fonseca@ipnp.mff.cuni.cz](mailto:fonseca@ipnp.mff.cuni.cz)

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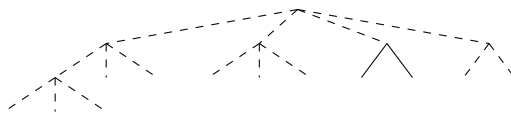
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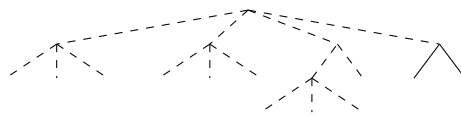
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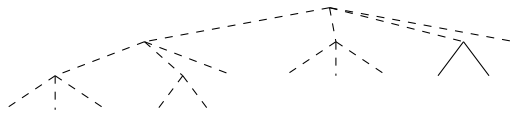
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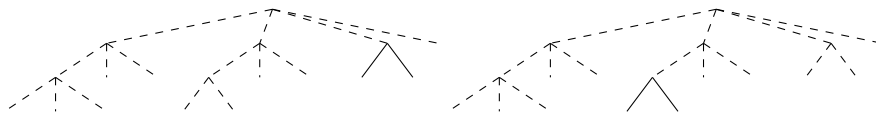
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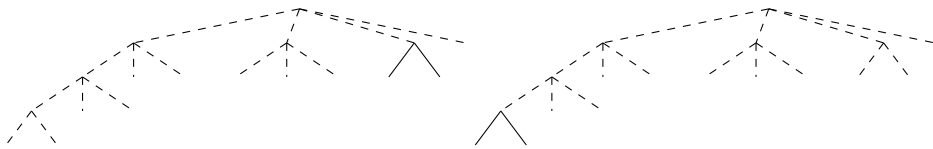
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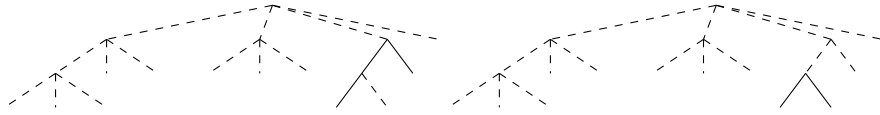
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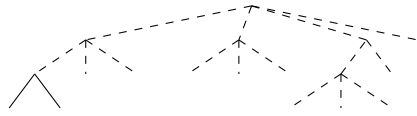
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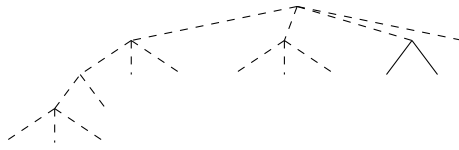
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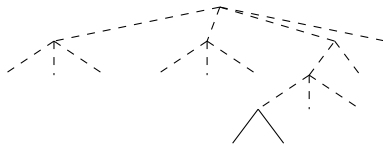
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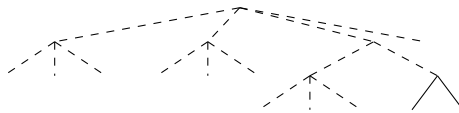
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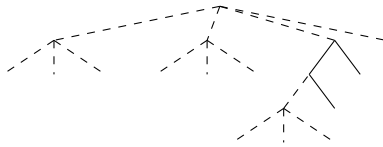
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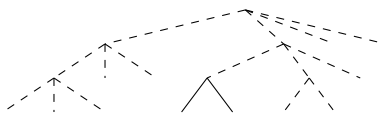
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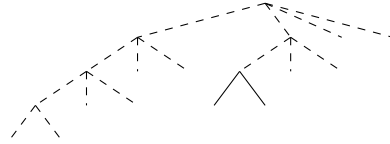
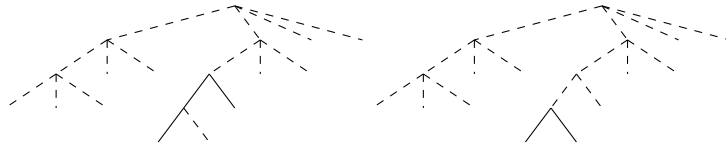
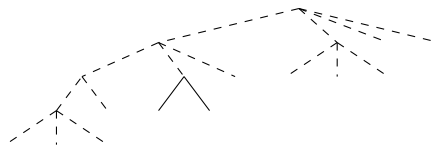
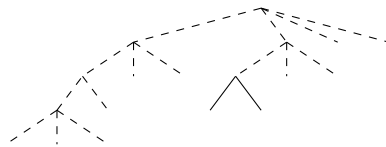
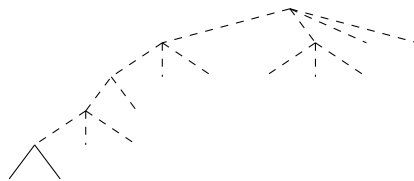
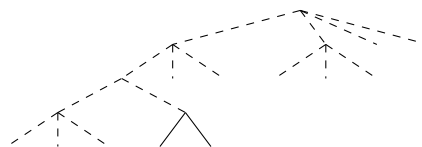


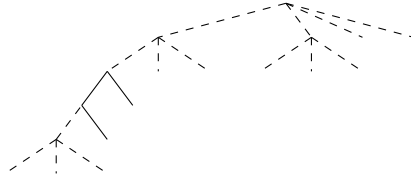
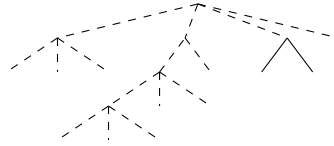
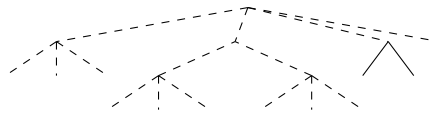
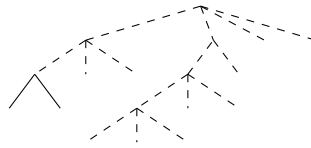
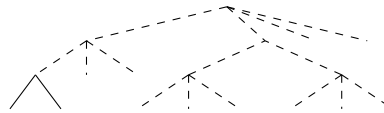
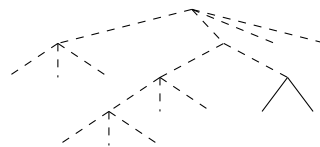
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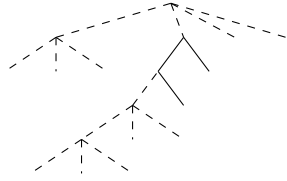
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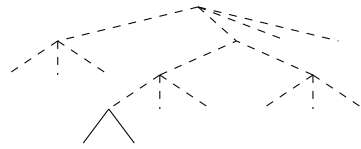
**Topology 18****Topology 19****Topology 20****Topology 21****Topology 22****Topology 23**

**Topology 24****Topology 25****Topology 26****Topology 27****Topology 28****Topology 29**

**Topology 30**



**Topology 31**



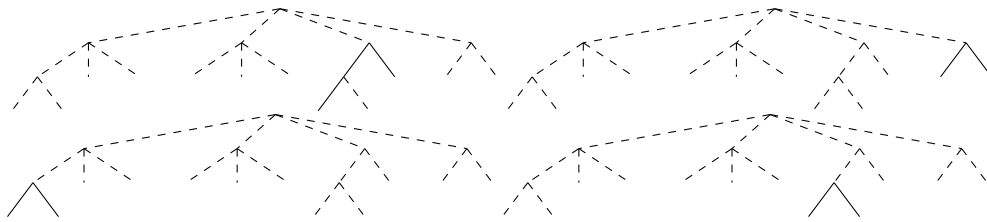
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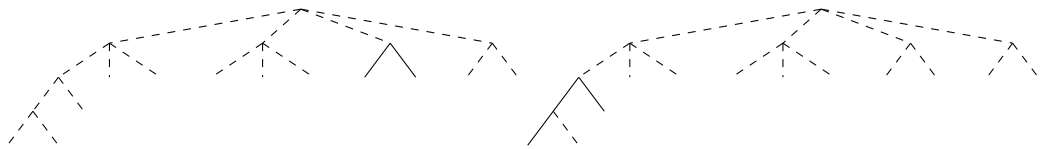
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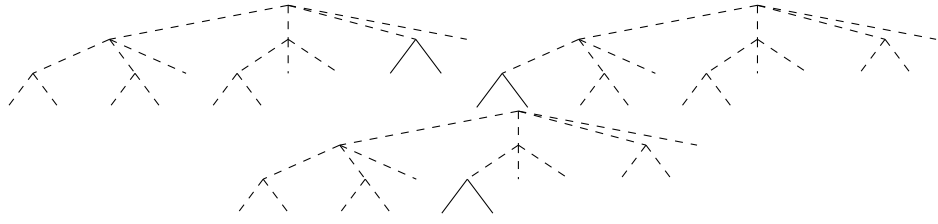


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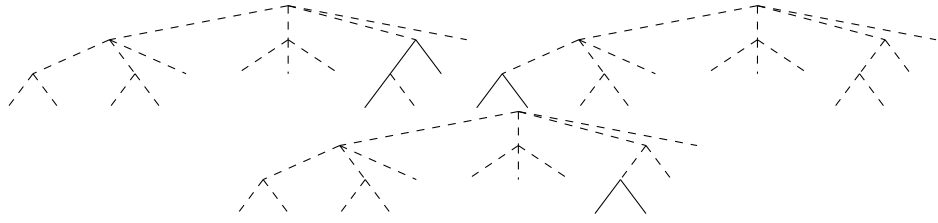




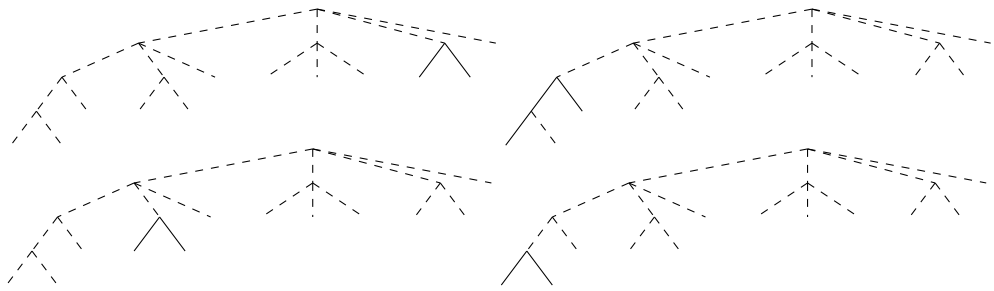
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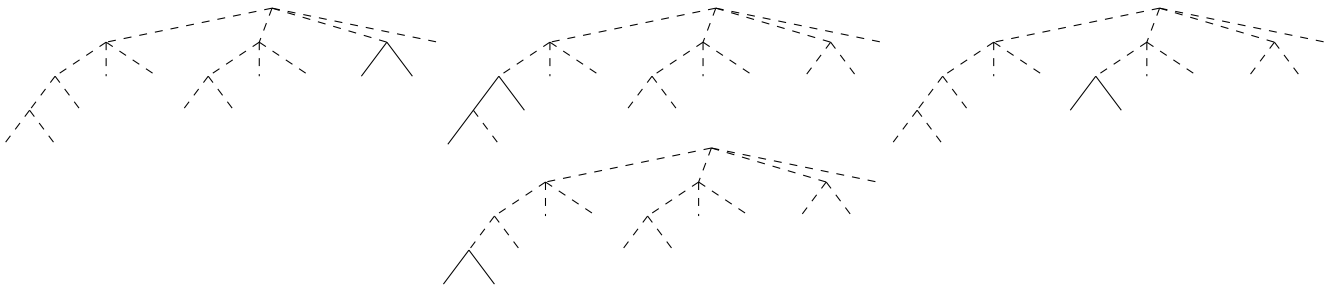
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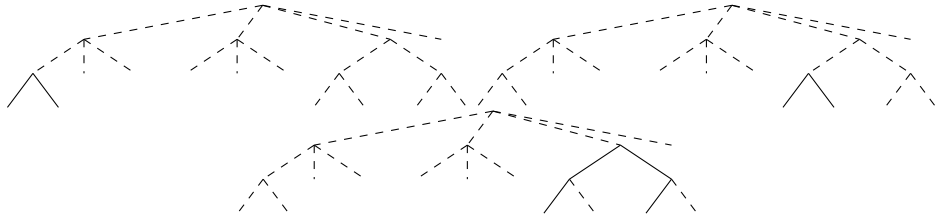


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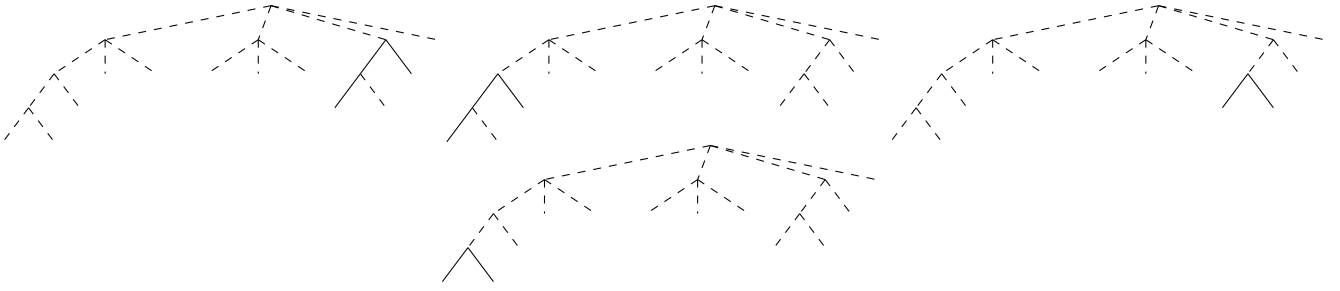




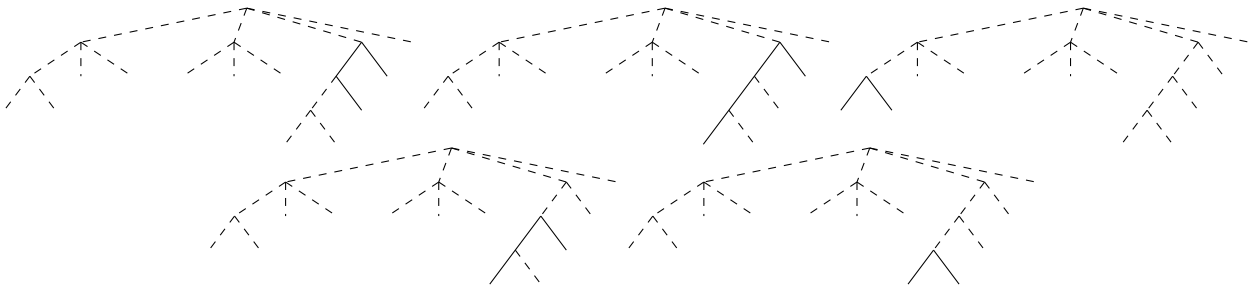
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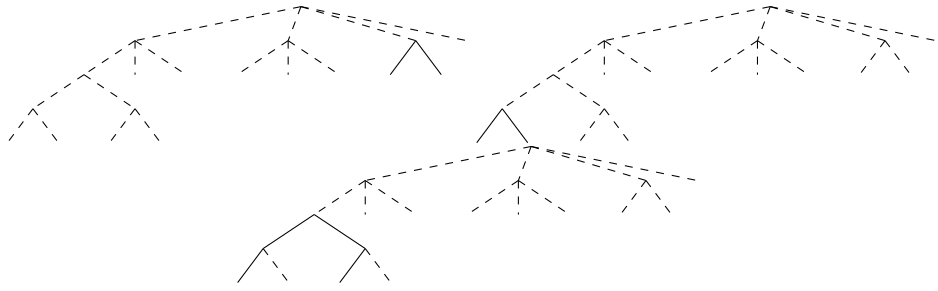
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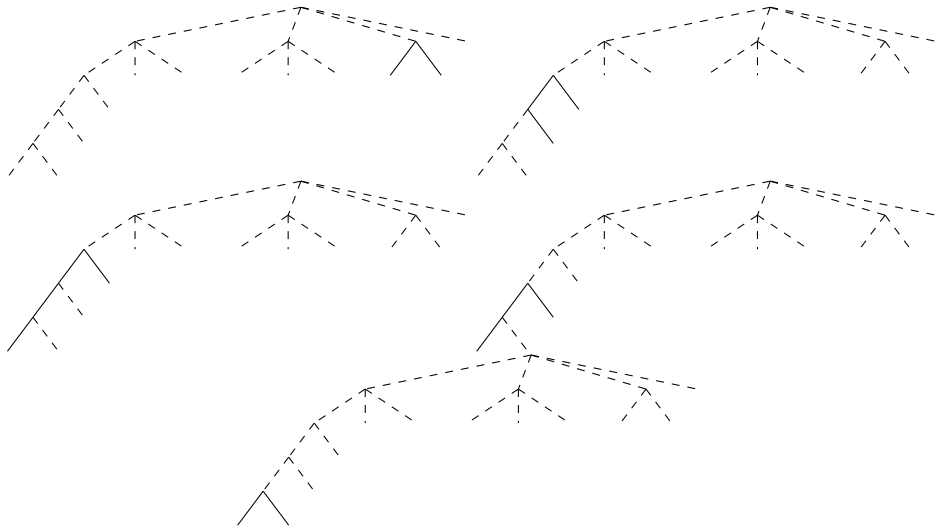
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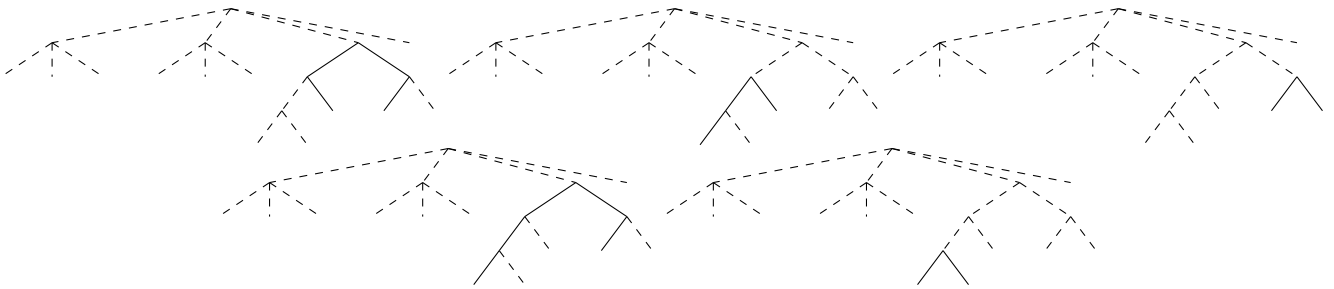
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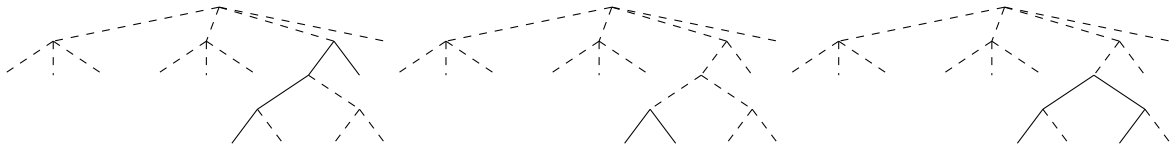
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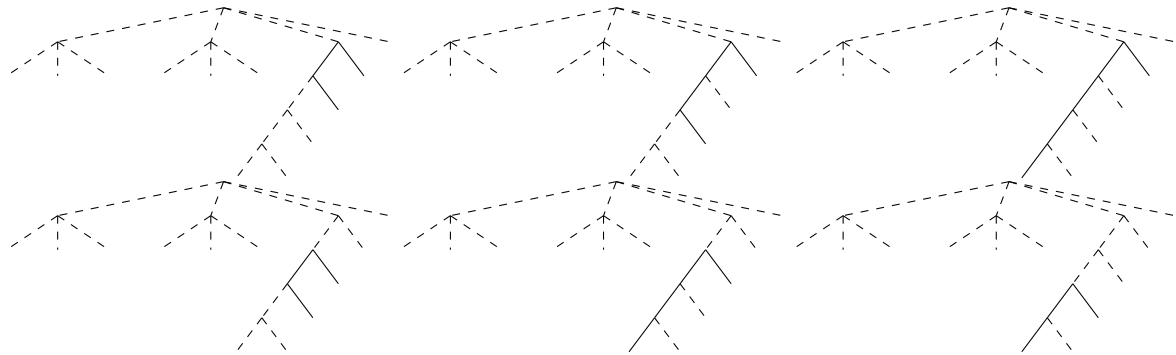
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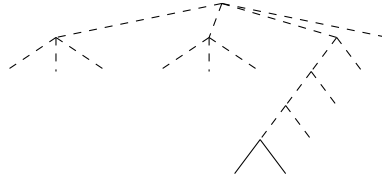


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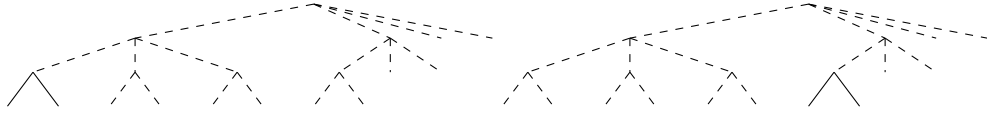


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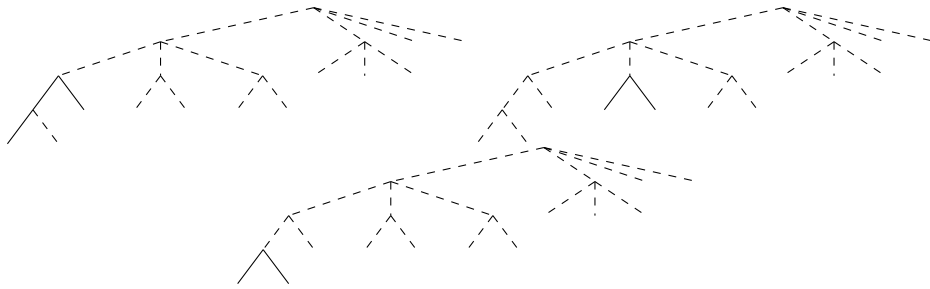




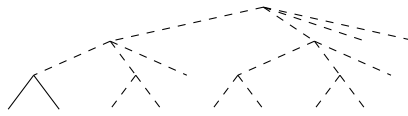
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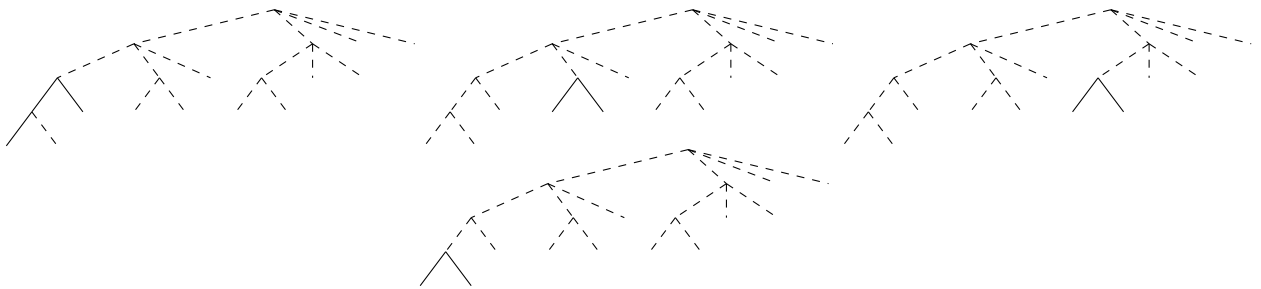
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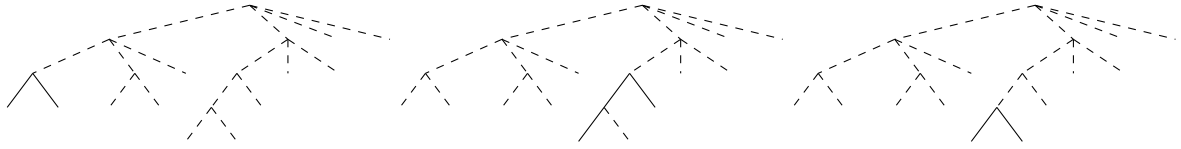
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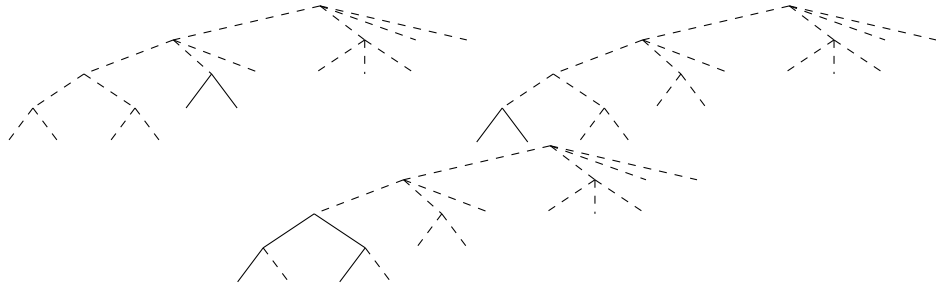
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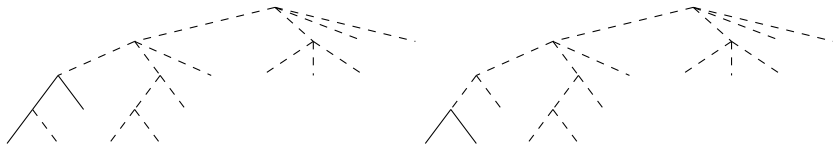
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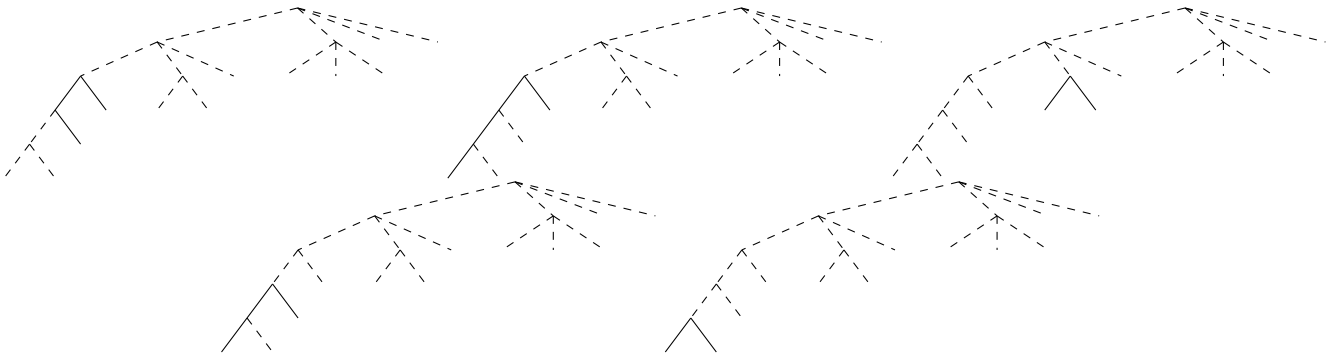
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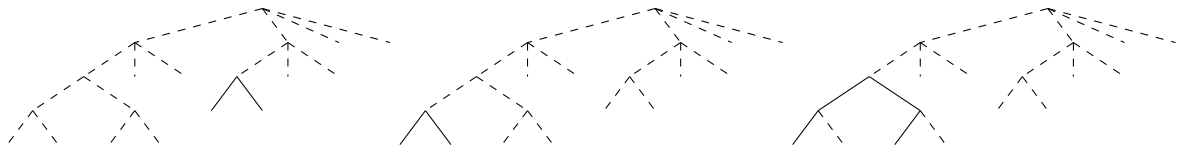
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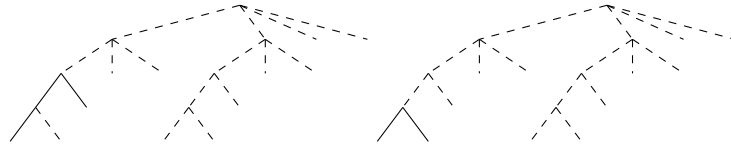
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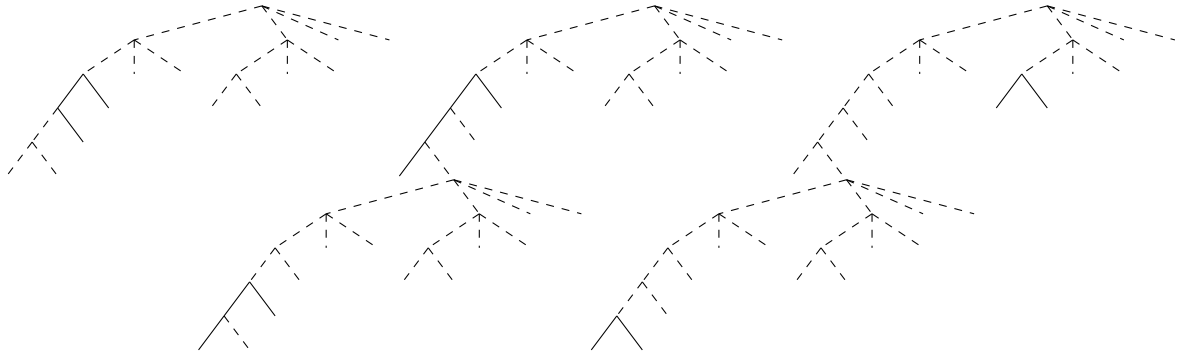
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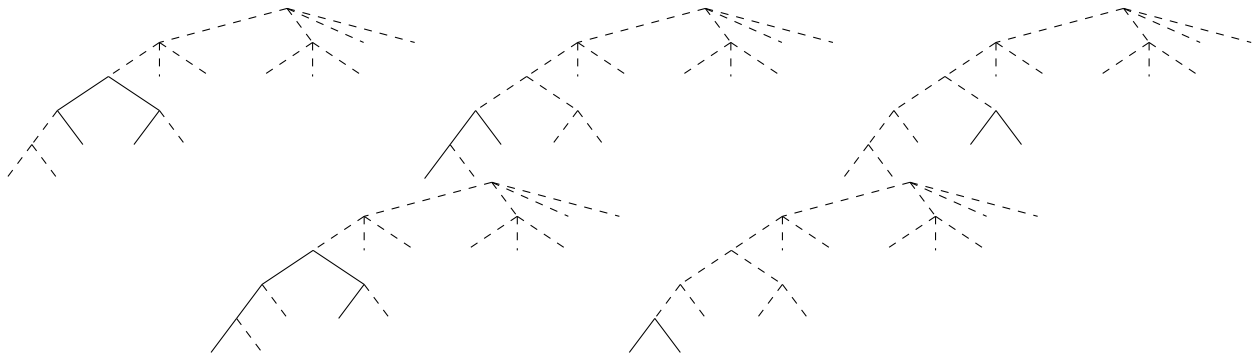
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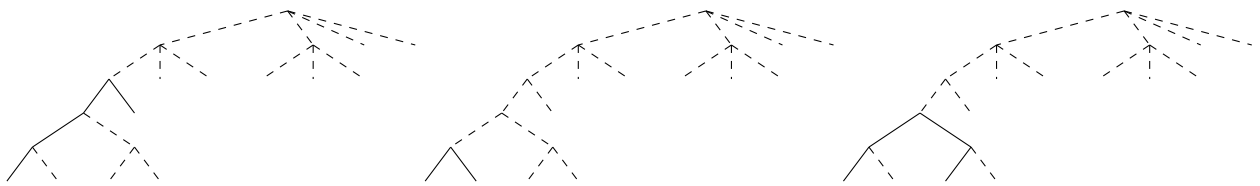
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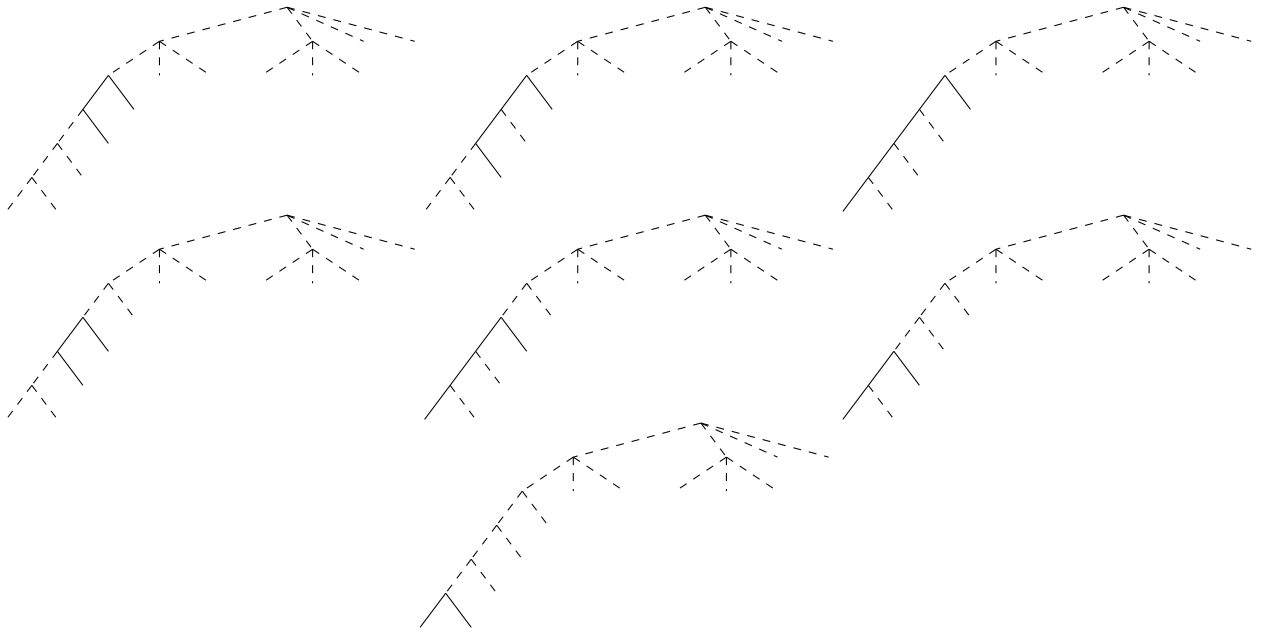
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**Topology 65**



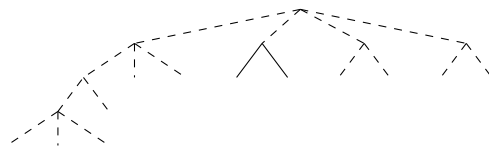
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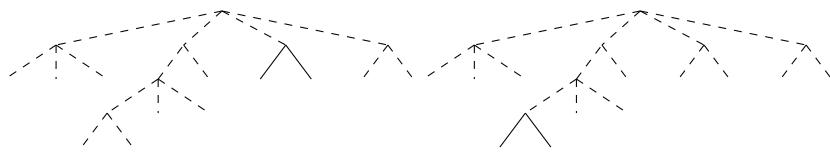
**Topology 67**



**Topology 68**



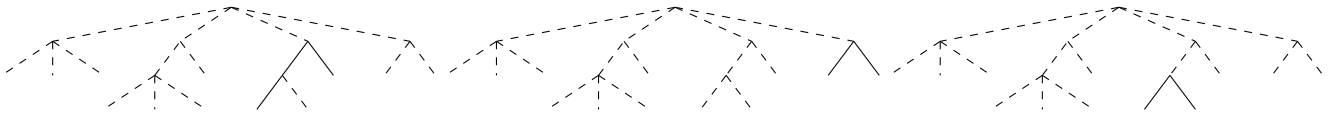
**Topology 69**



**Topology 70**



**Topology 71**



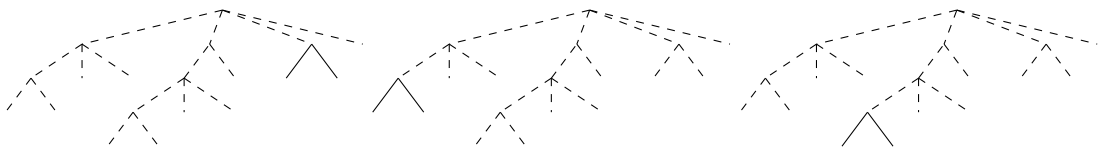
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**Topology 73**



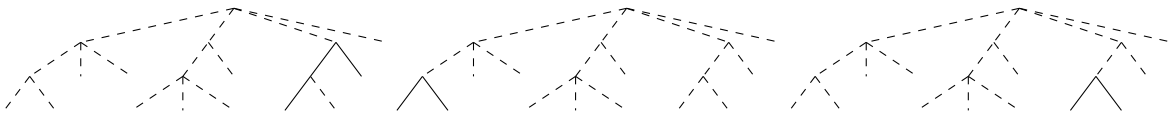
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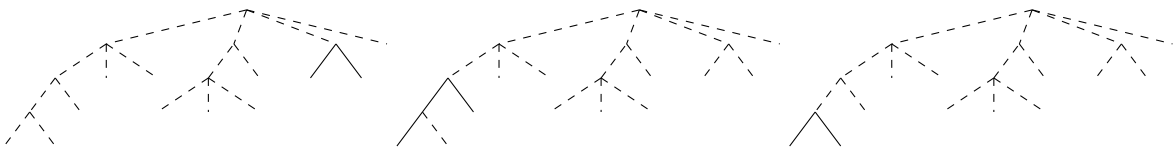
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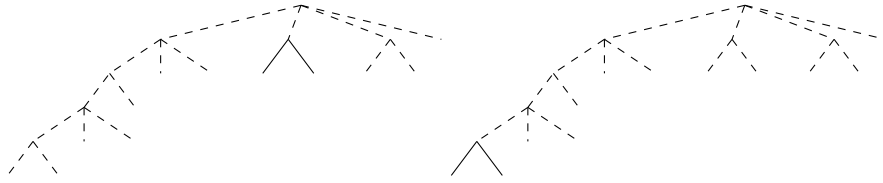
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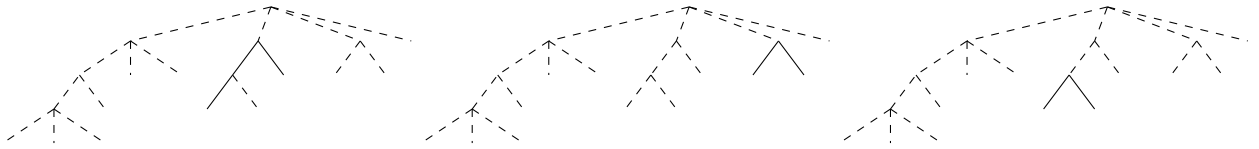
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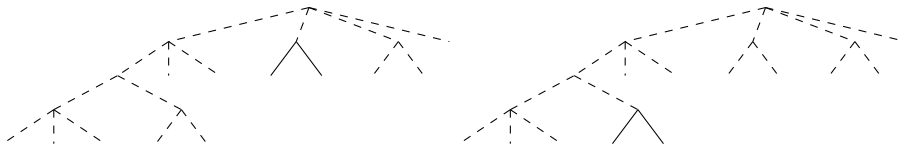
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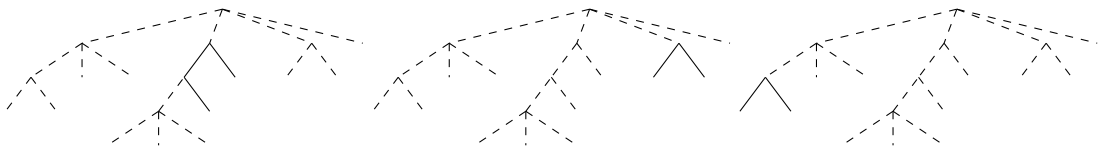
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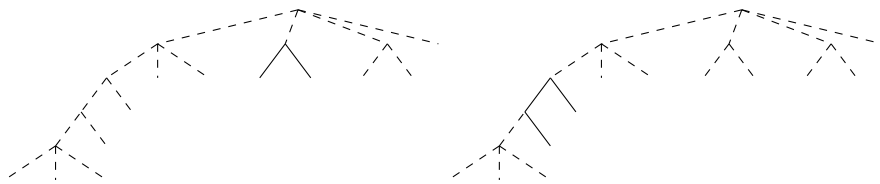
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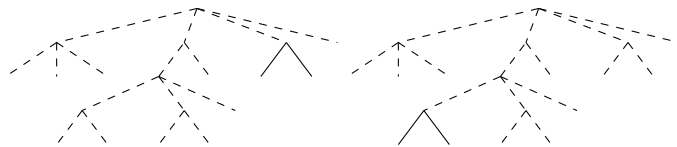
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**Topology 82**

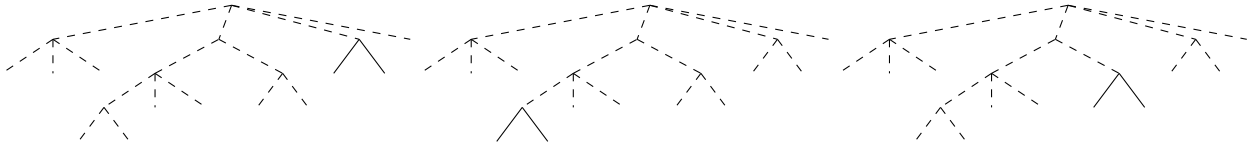


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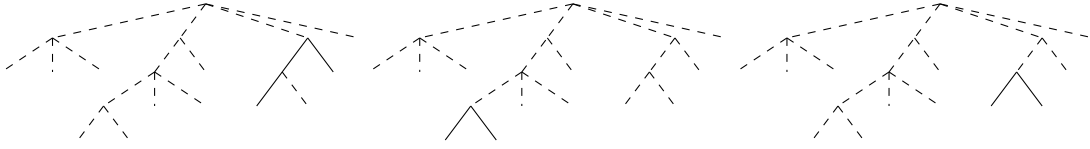




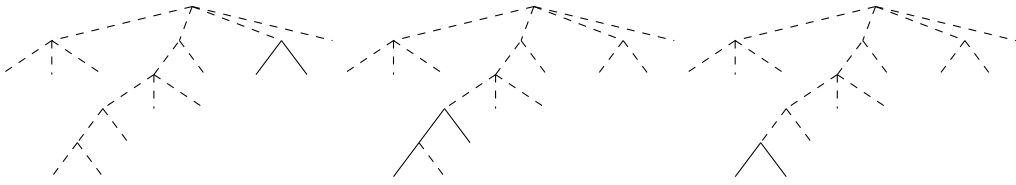
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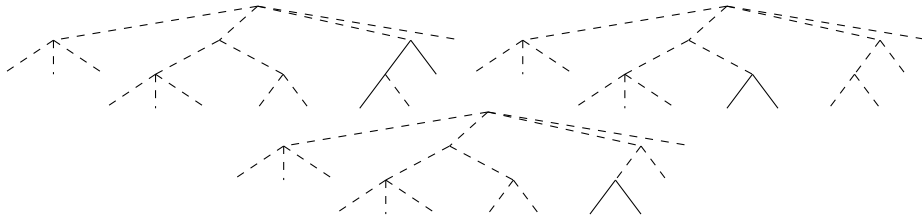
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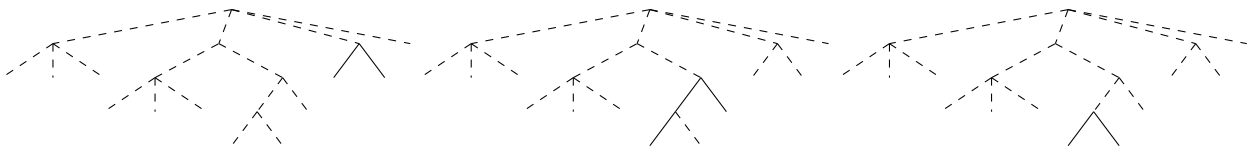
**Topology 86**



**Topology 87**



**Topology 88**

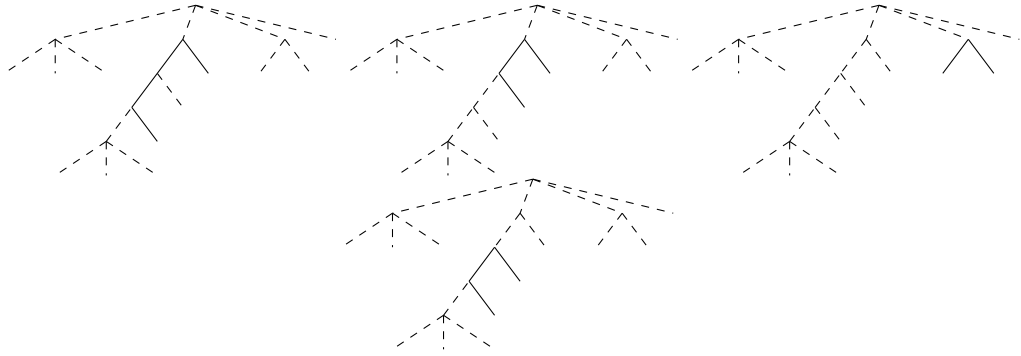


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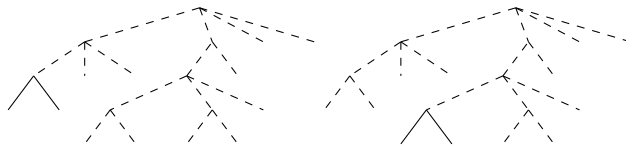




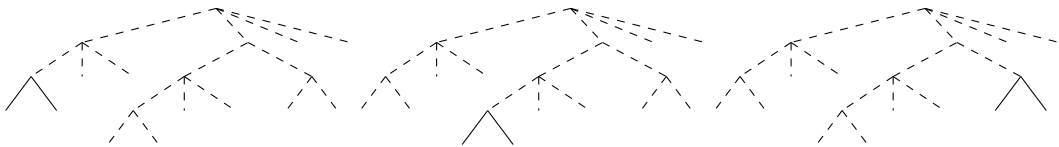
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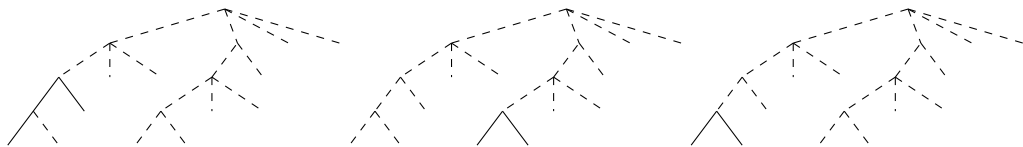
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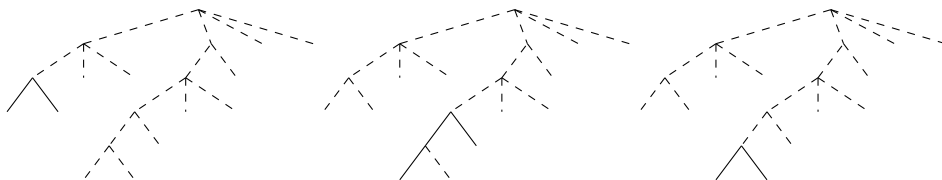
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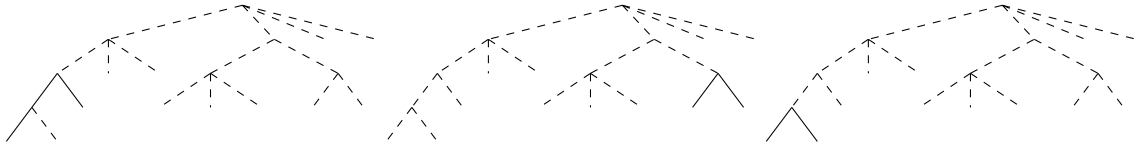
**Topology 98**



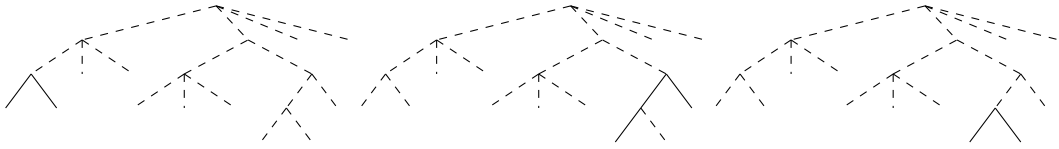
**Topology 99**



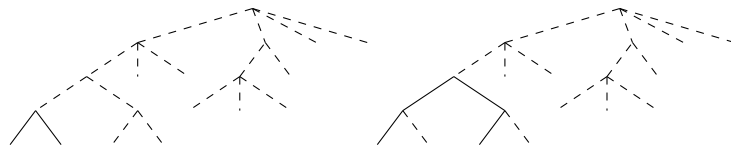
**Topology 100**



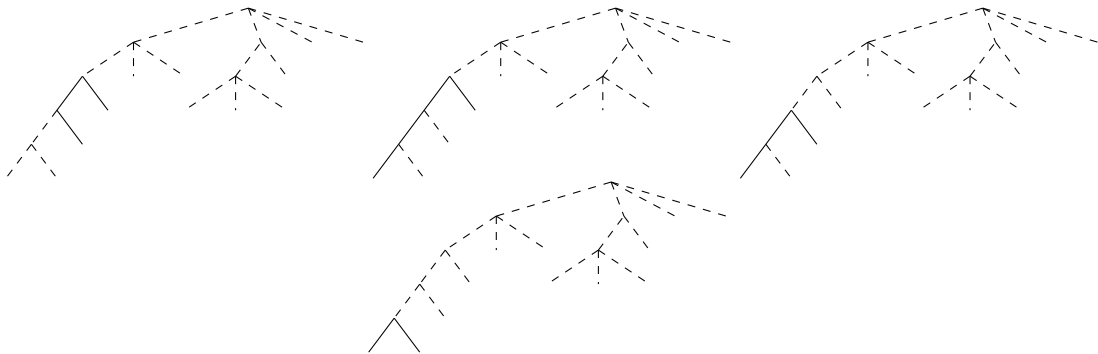
**Topology 101**



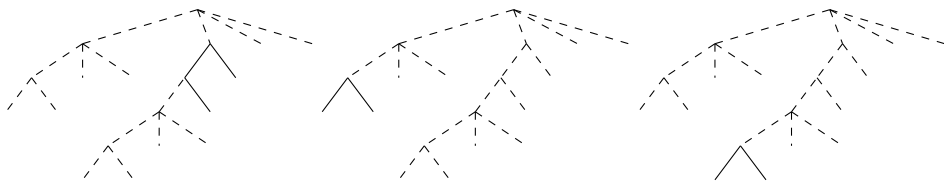
**Topology 102**



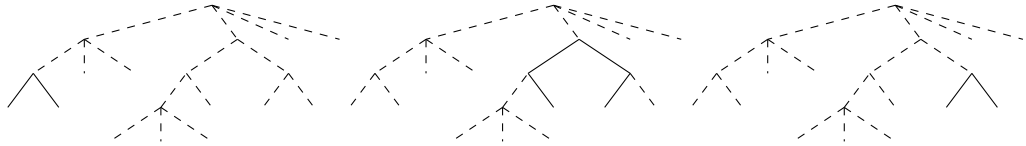
**Topology 103**



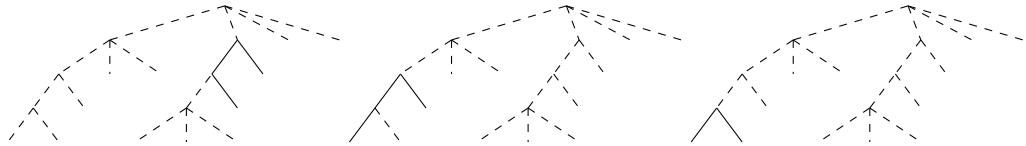
**Topology 104**



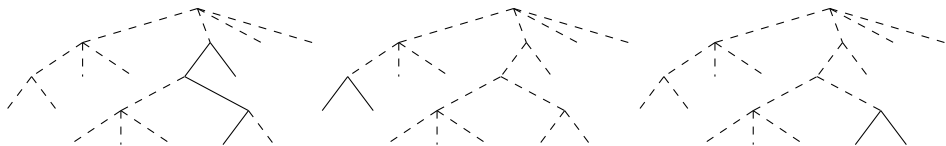
**Topology 105**



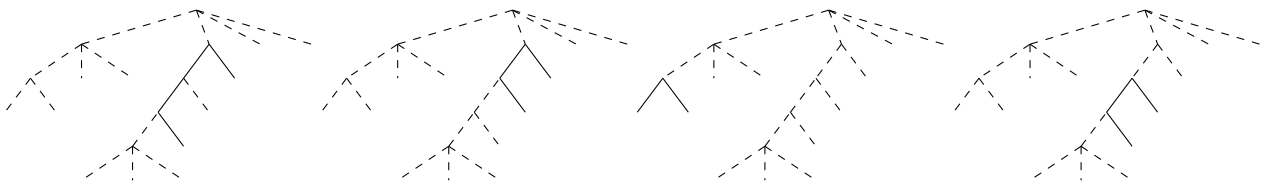
**Topology 106**



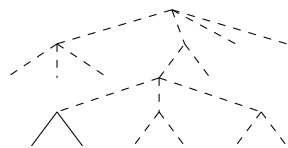
**Topology 107**



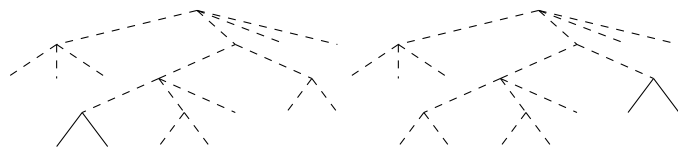
**Topology 108**

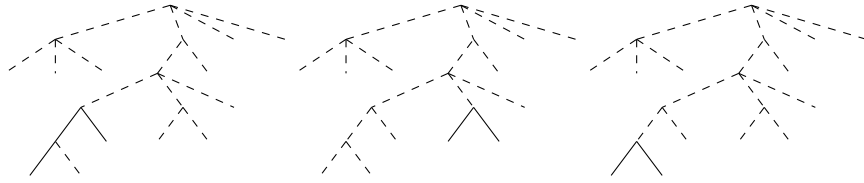
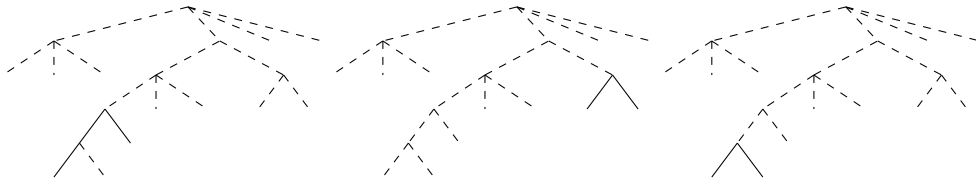
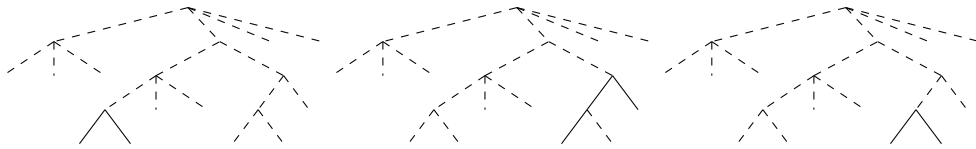
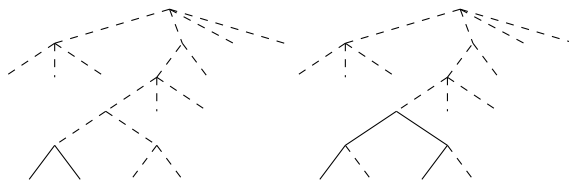
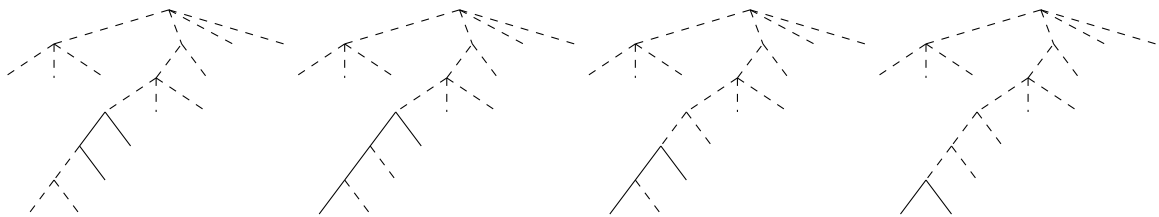
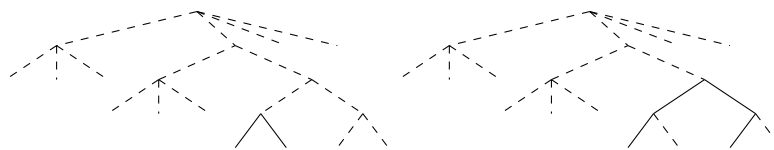


**Topology 109**

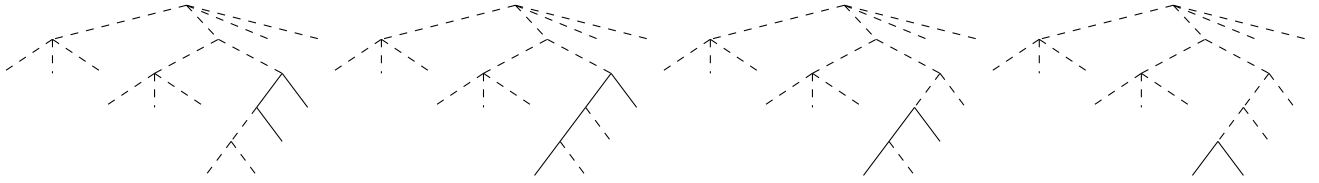


**Topology 110**

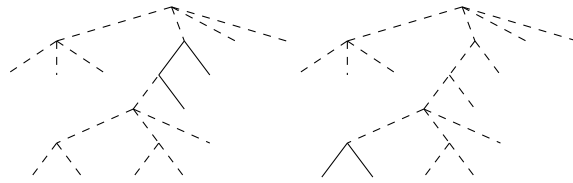


**Topology 111****Topology 112****Topology 113****Topology 114****Topology 115****Topology 116**

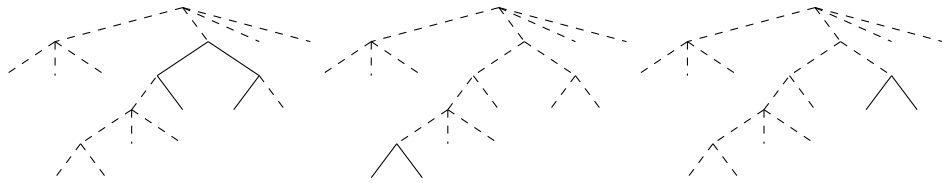
**Topology 117**



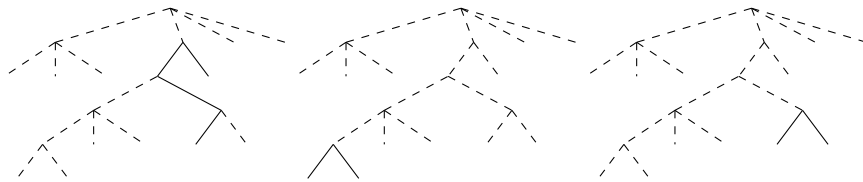
**Topology 118**



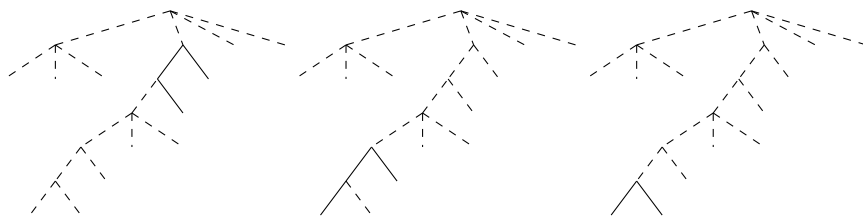
**Topology 119**



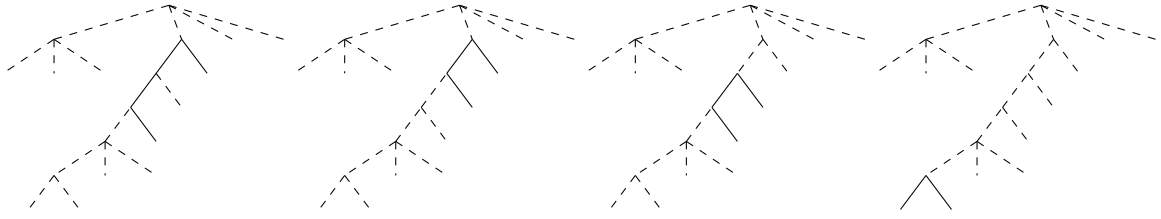
**Topology 120**



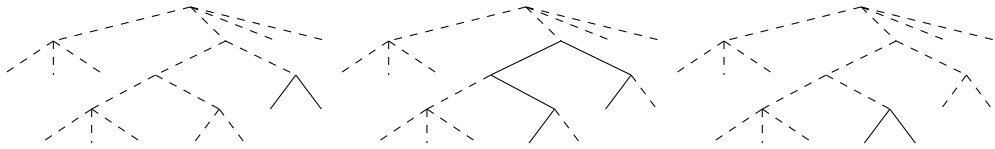
**Topology 121**



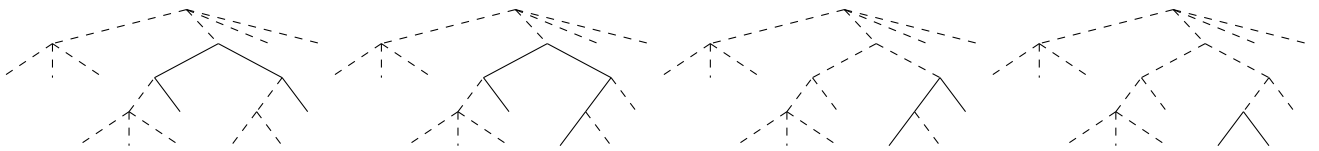
**Topology 122**



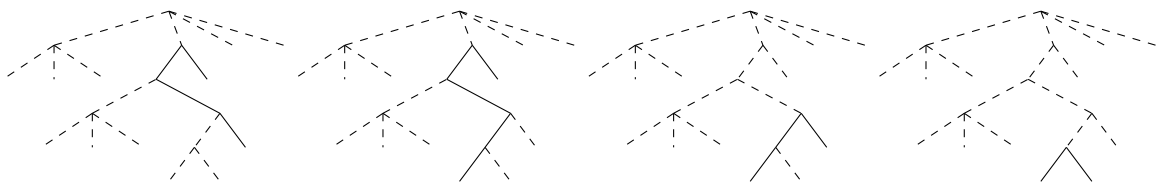
**Topology 123**



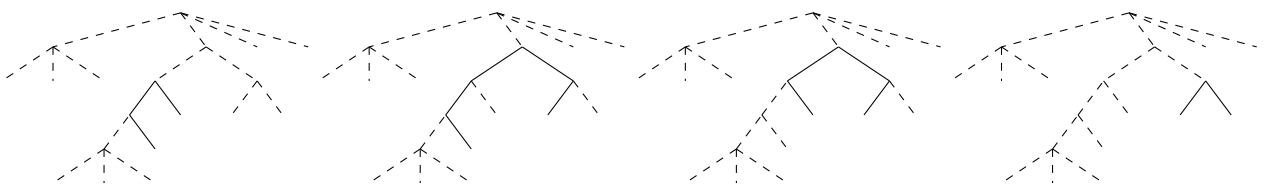
**Topology 124**



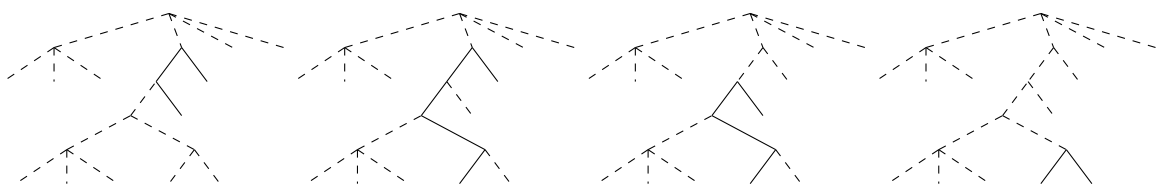
**Topology 125**



**Topology 126**

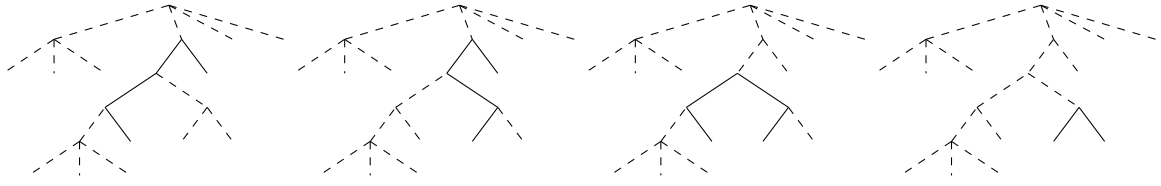


**Topology 127**

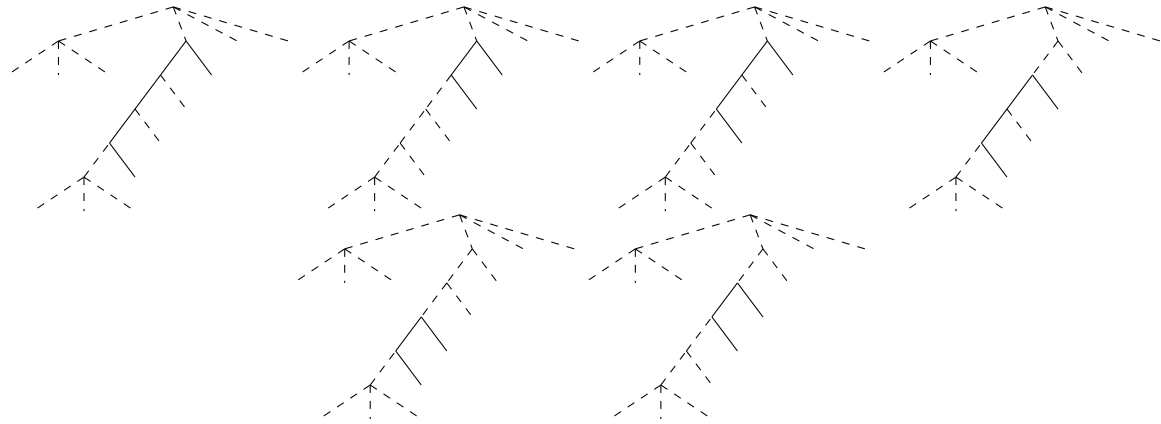




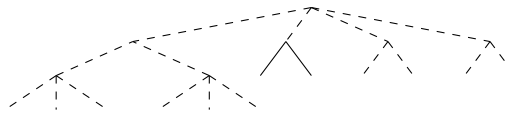
**Topology 128**



**Topology 129**



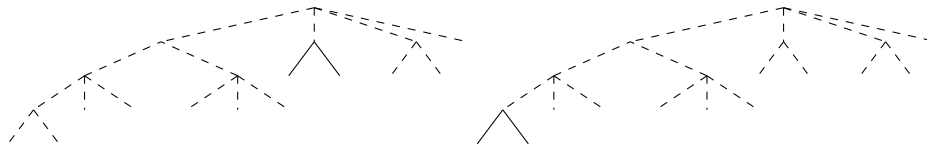
**Topology 130**



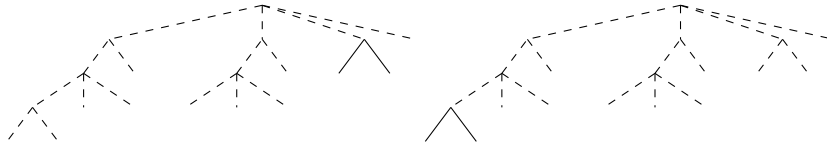
**Topology 131**



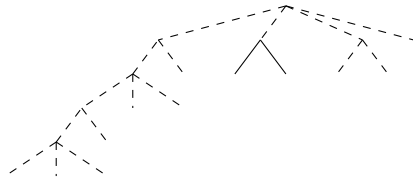
**Topology 132**



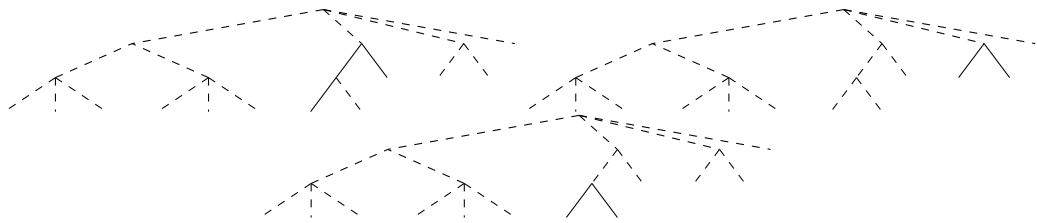
**Topology 133**



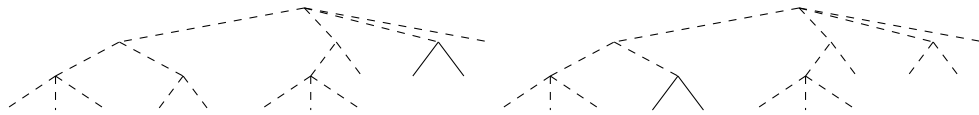
**Topology 134**



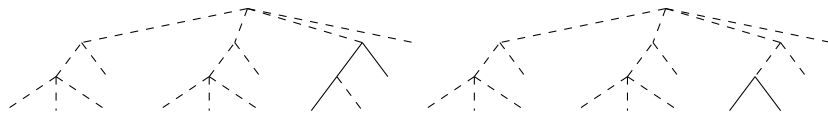
**Topology 135**



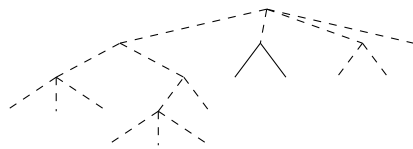
**Topology 136**



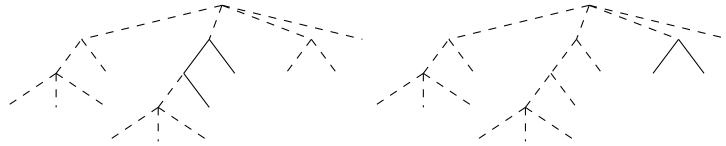
**Topology 137**



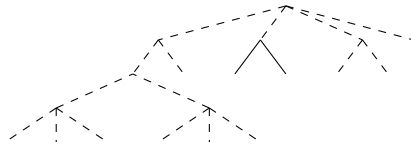
**Topology 138**



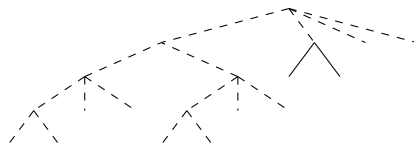
**Topology 139**



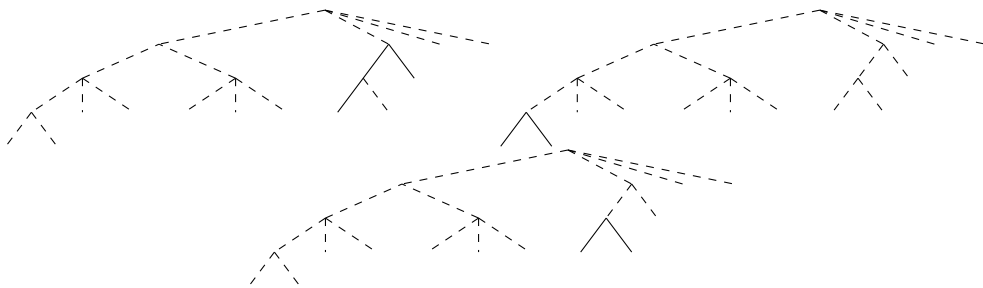
**Topology 140**



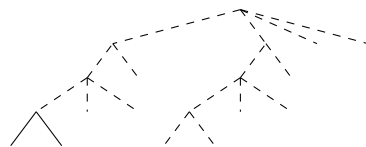
**Topology 141**



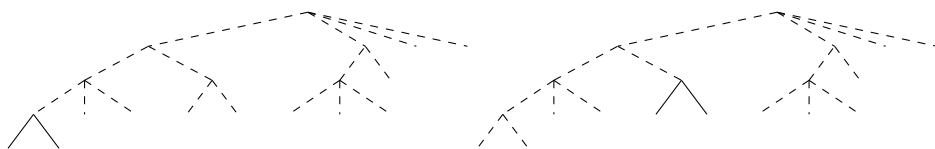
**Topology 142**



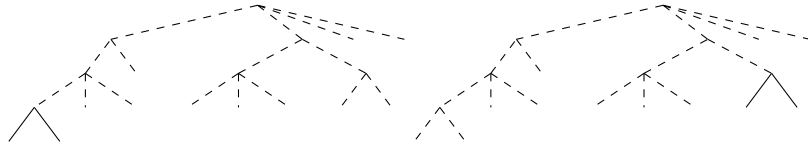
**Topology 143**



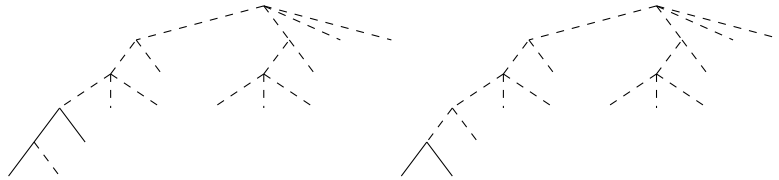
**Topology 144**



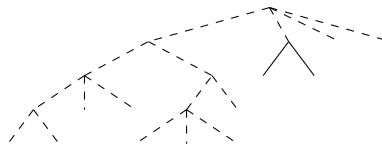
**Topology 145**



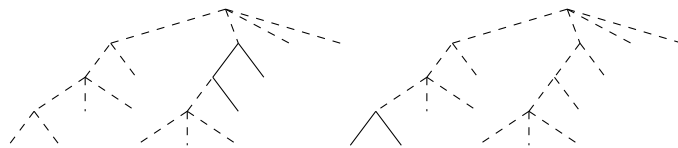
**Topology 146**



**Topology 147**



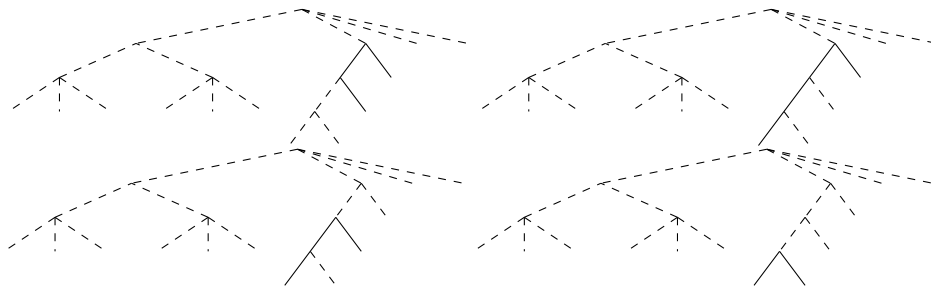
**Topology 148**



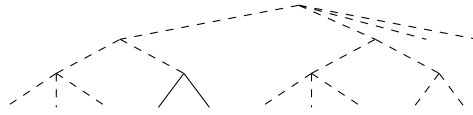
**Topology 149**



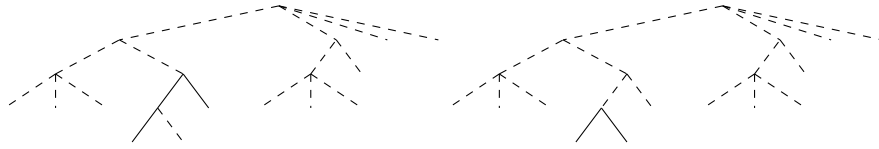
**Topology 150**



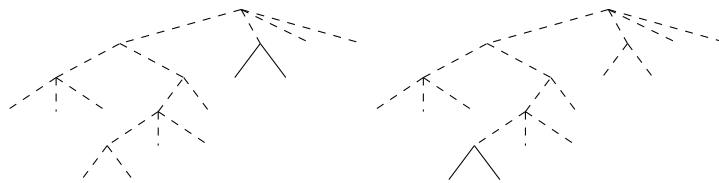
**Topology 151**



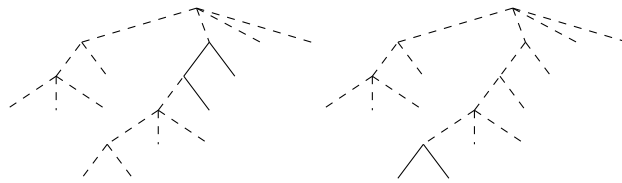
**Topology 152**



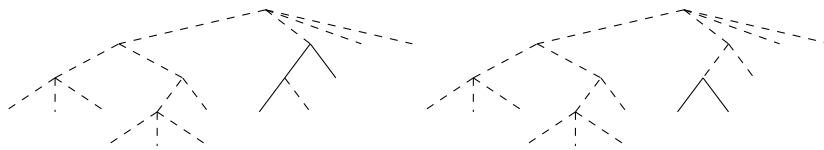
**Topology 153**



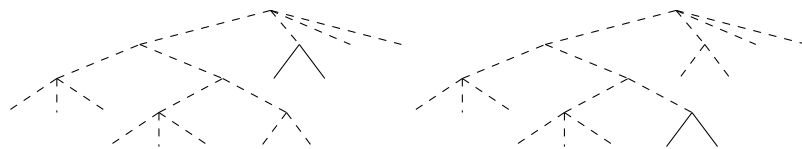
**Topology 154**



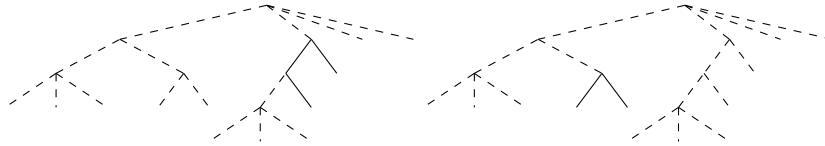
**Topology 155**



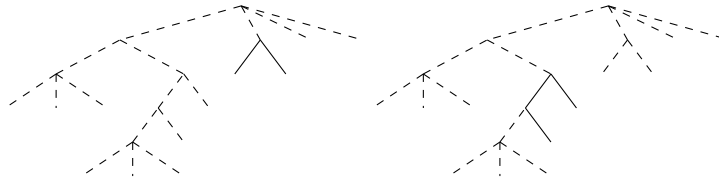
**Topology 156**



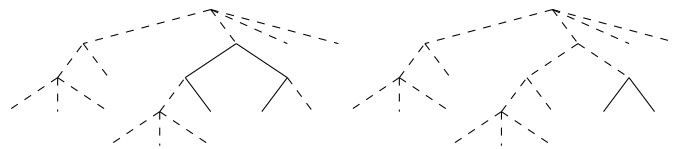
**Topology 157**



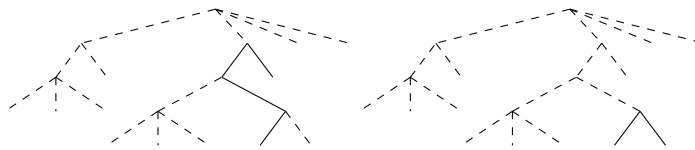
**Topology 158**



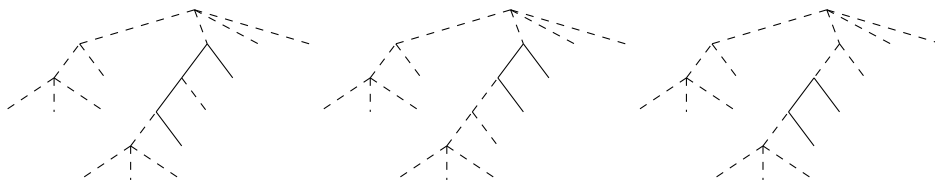
**Topology 159**



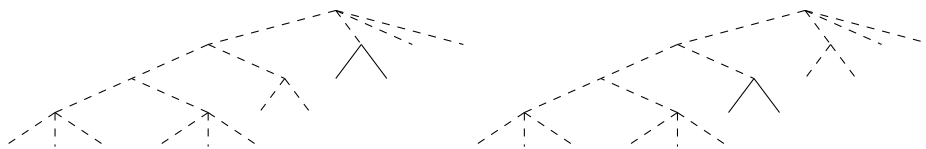
**Topology 160**



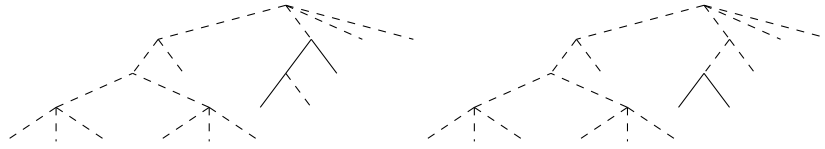
**Topology 161**



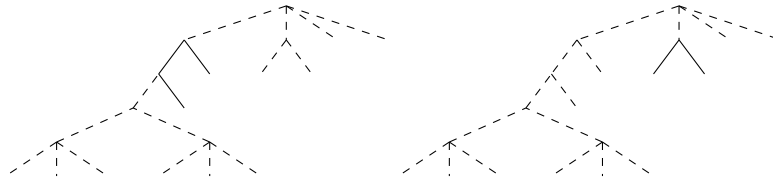
**Topology 162**



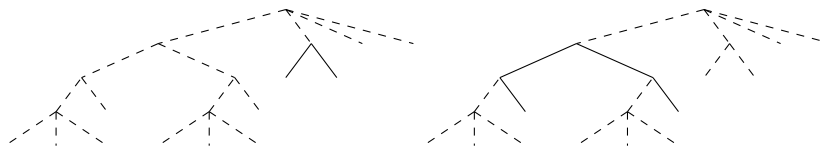
**Topology 163**



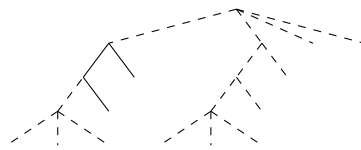
**Topology 164**



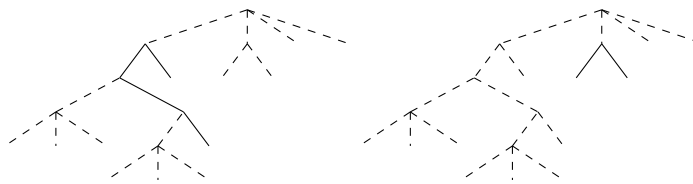
**Topology 165**



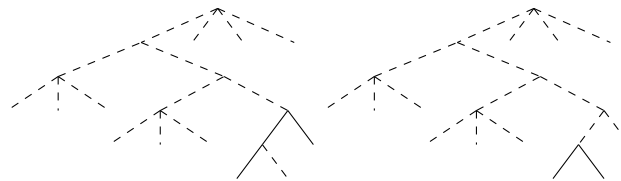
**Topology 166**



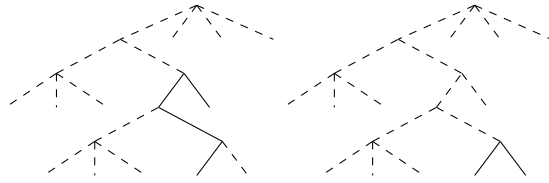
**Topology 167**



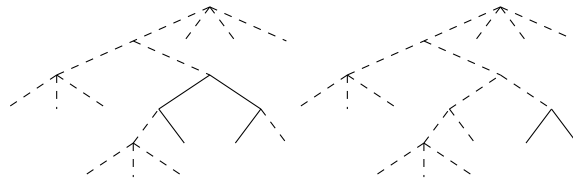
**Topology 168**



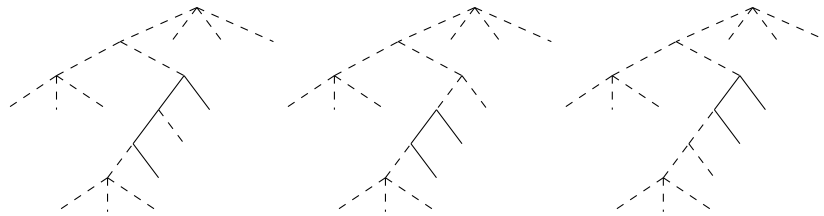
**Topology 169**



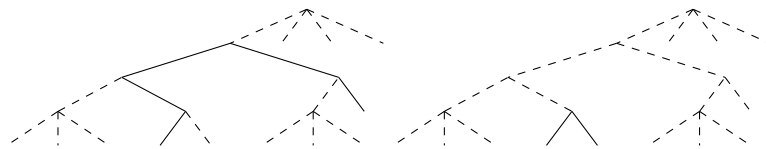
**Topology 170**



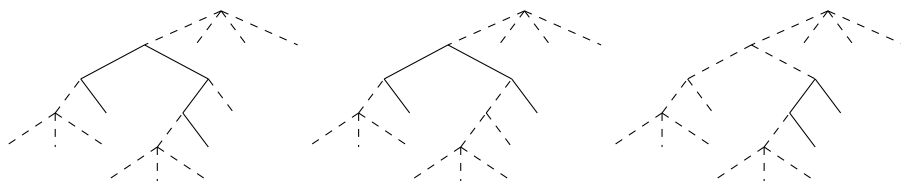
**Topology 171**



**Topology 172**

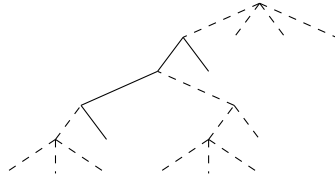


**Topology 173**

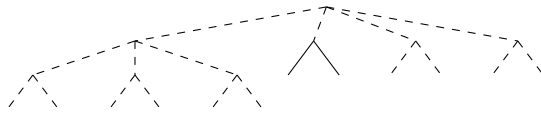




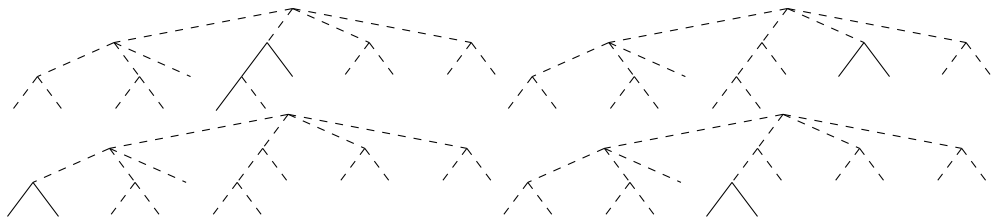
**Topology 174**



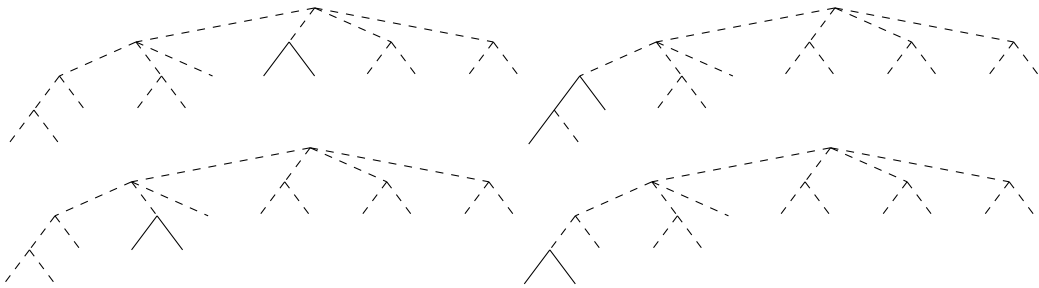
**Topology 175**



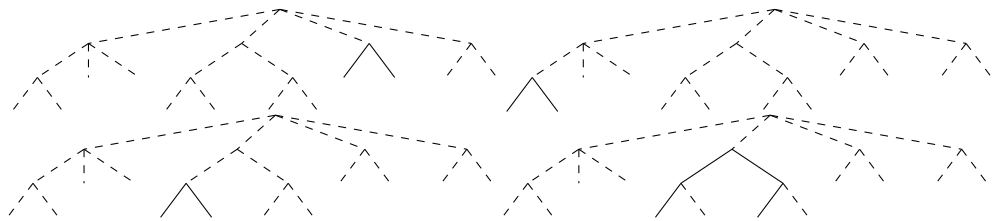
**Topology 176**



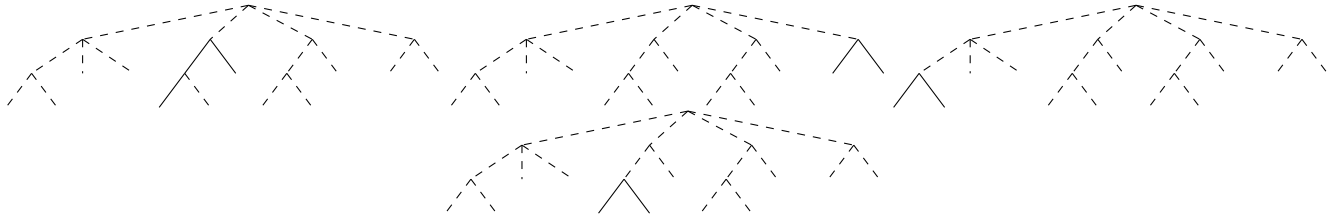
**Topology 177**



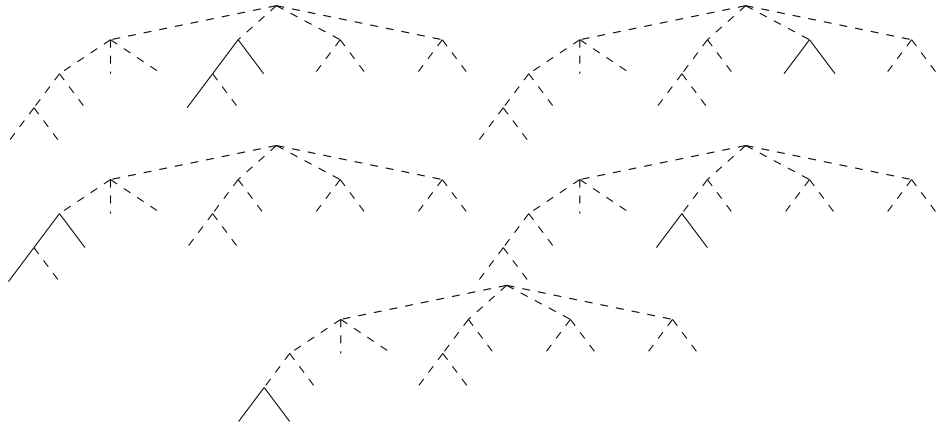
**Topology 178**



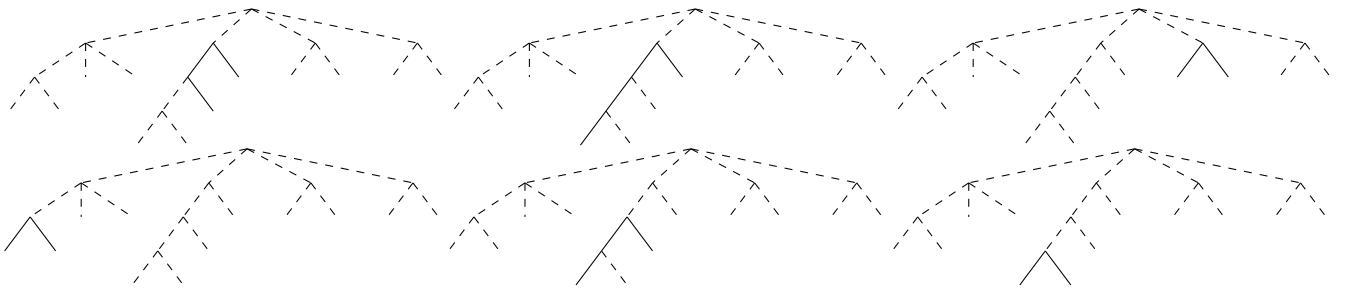
**Topology 179**



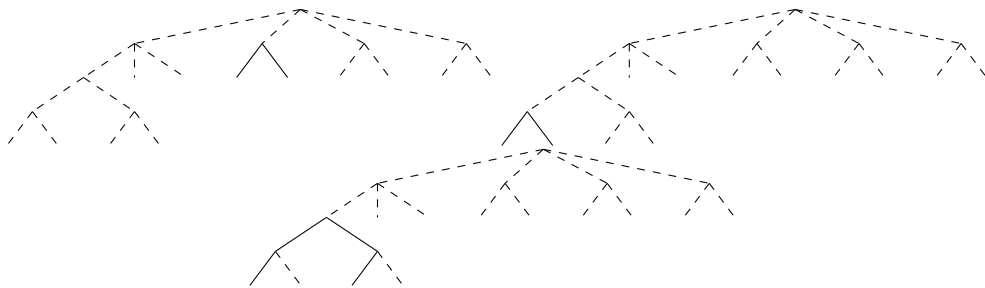
**Topology 180**



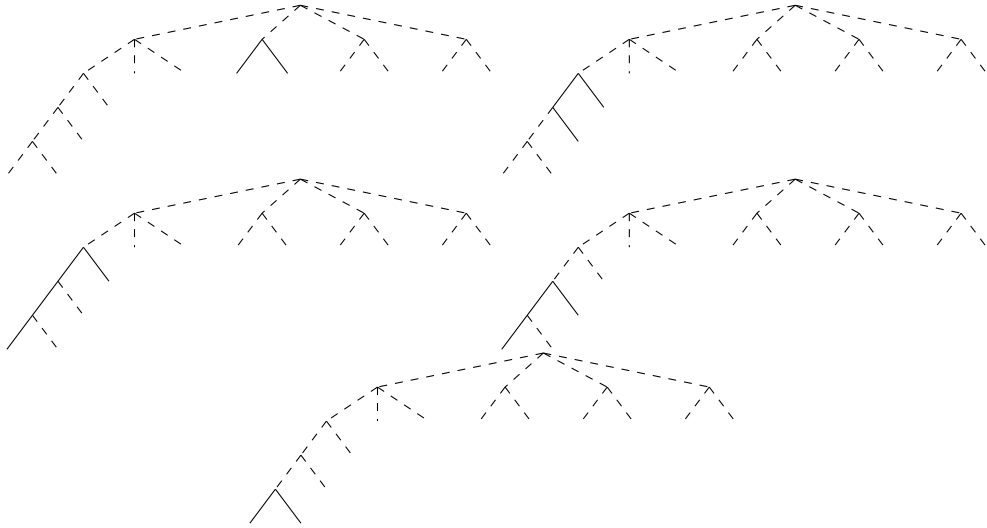
**Topology 181**



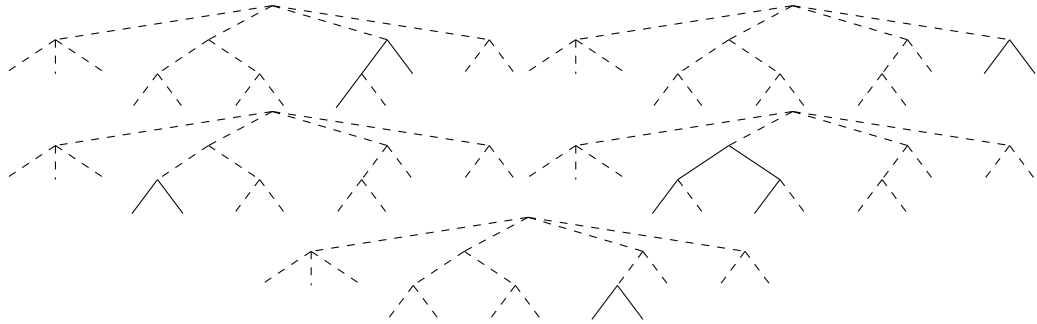
**Topology 182**



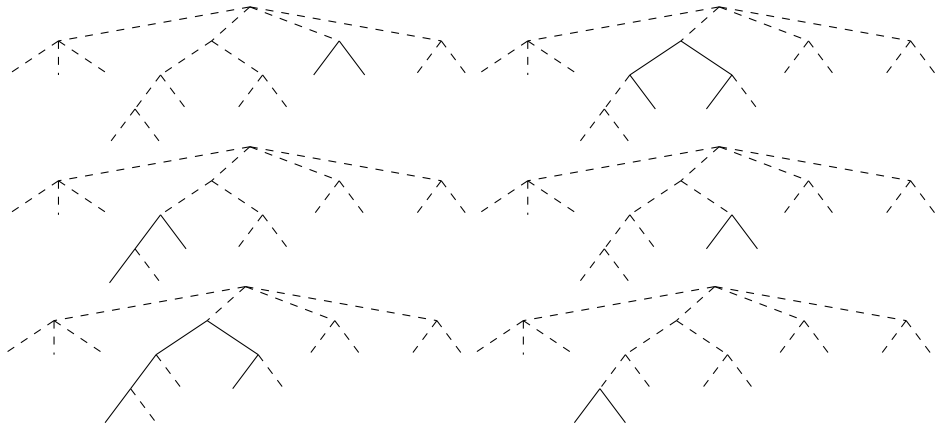
**Topology 183**



**Topology 184**



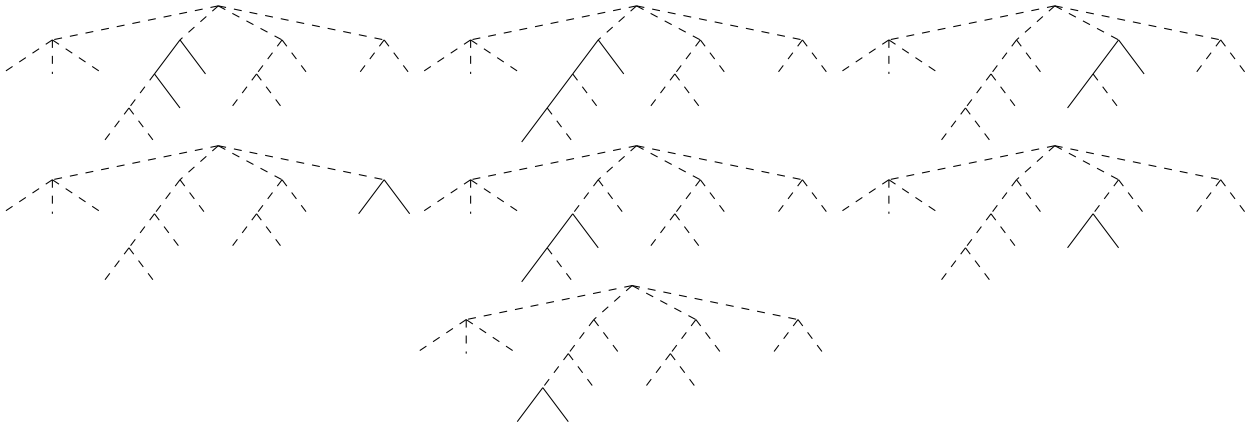
**Topology 185**



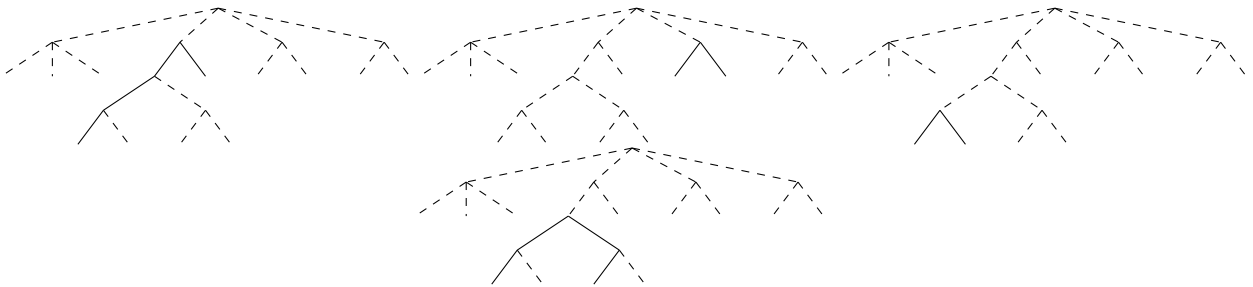
**Topology 186**



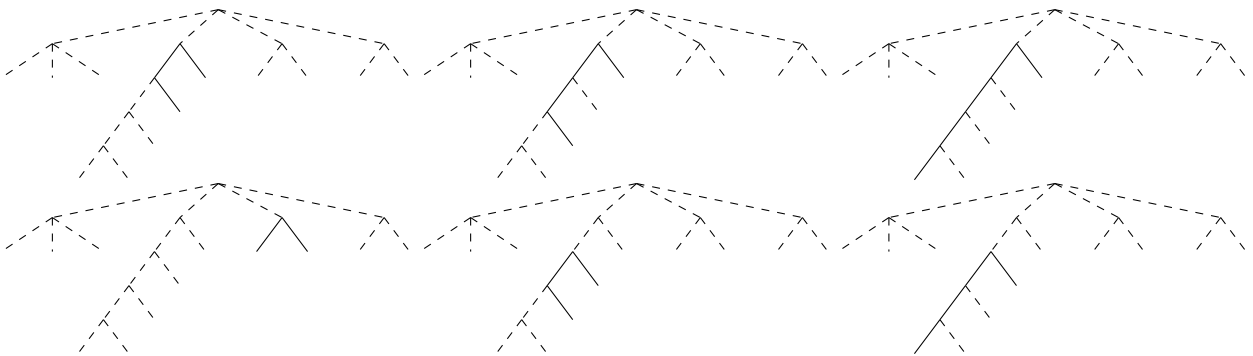
**Topology 187**

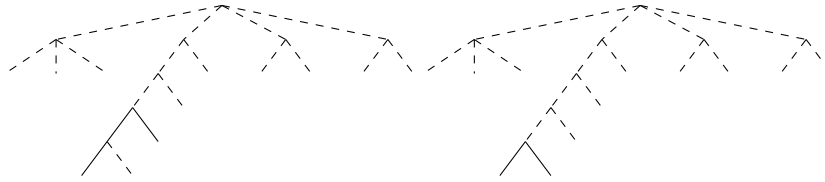


**Topology 188**

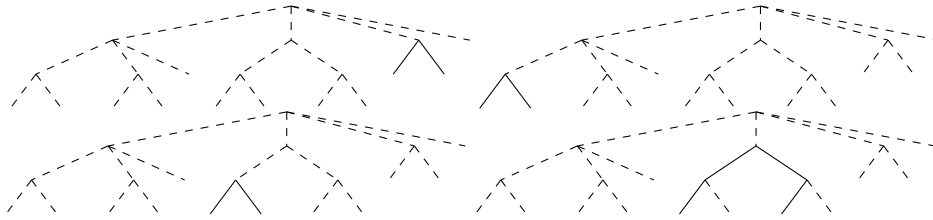


**Topology 189**

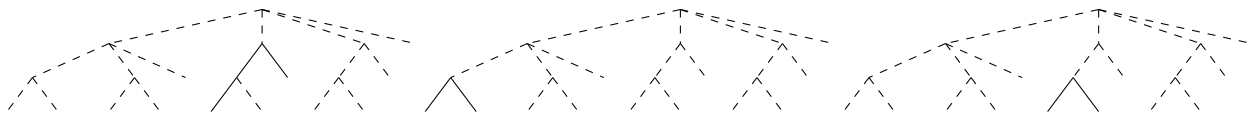




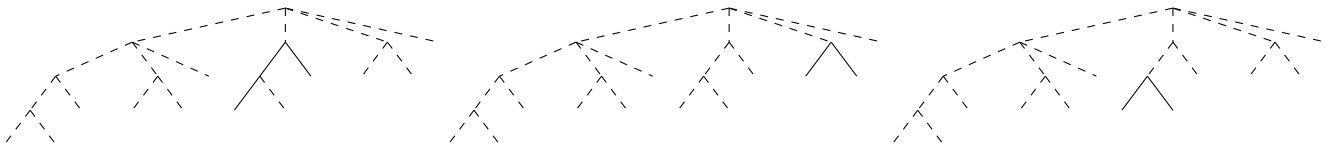
**Topology 190**



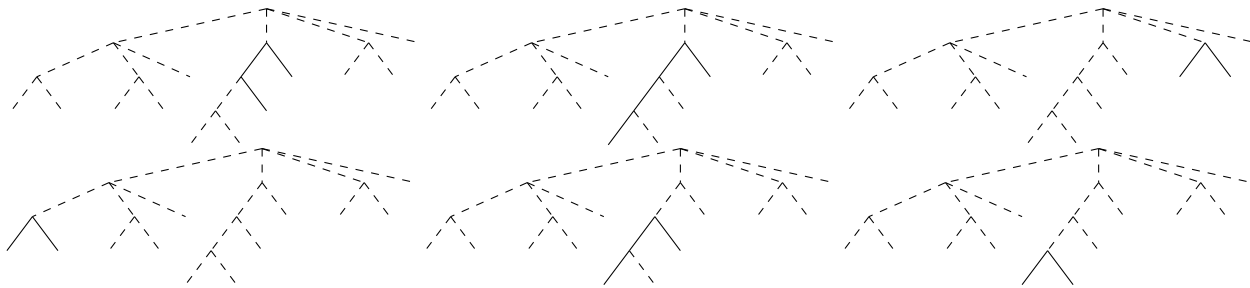
**Topology 191**



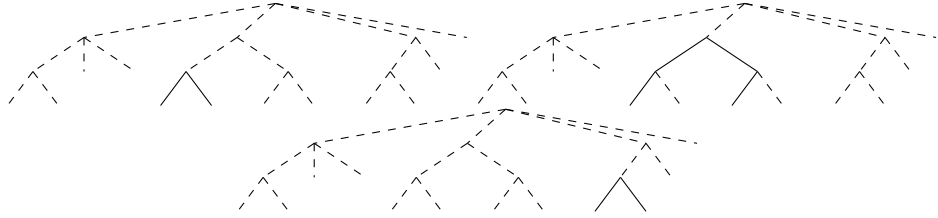
**Topology 192**



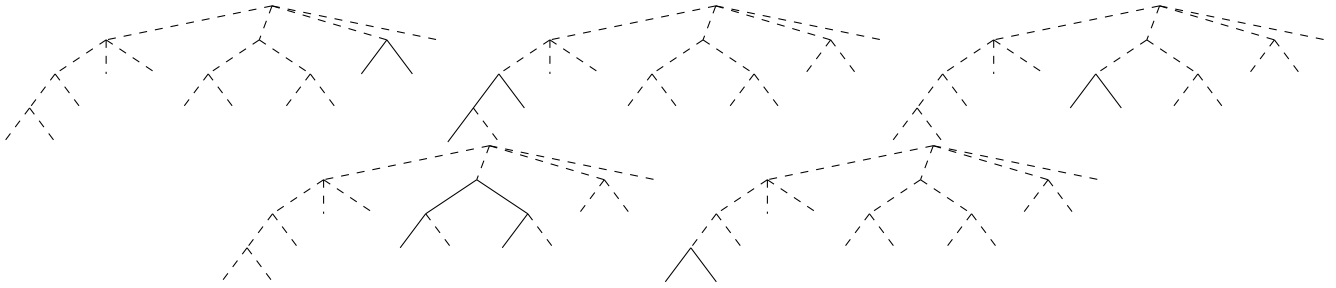
**Topology 193**



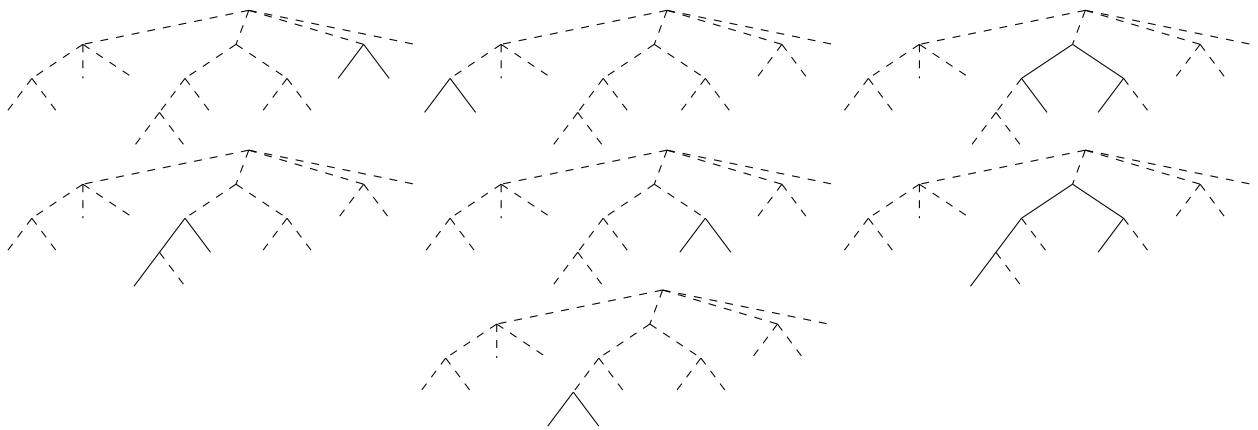
**Topology 194**



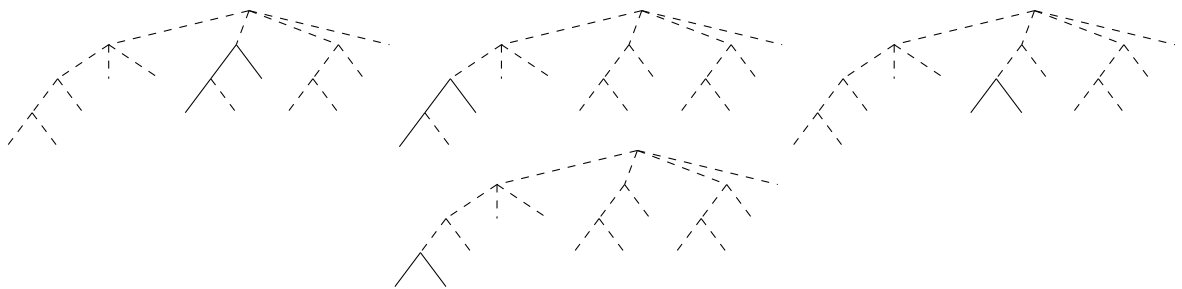
**Topology 195**



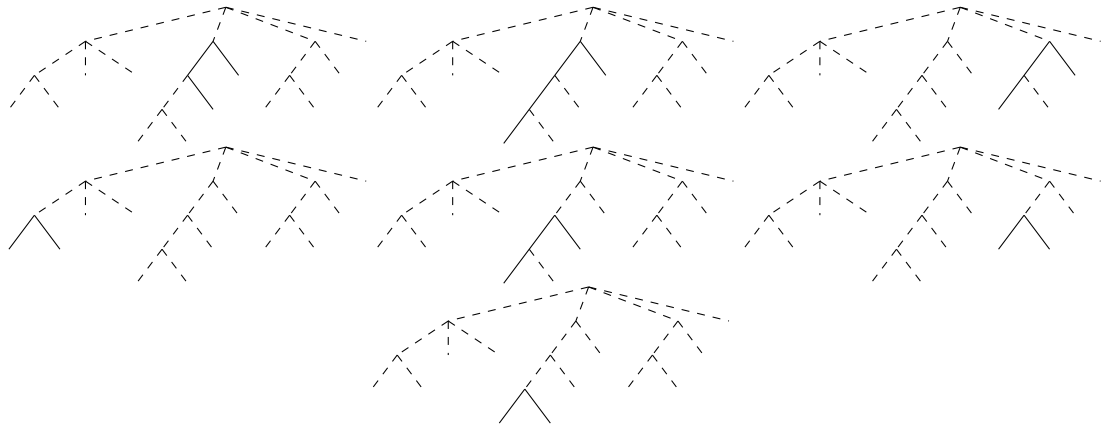
**Topology 196**



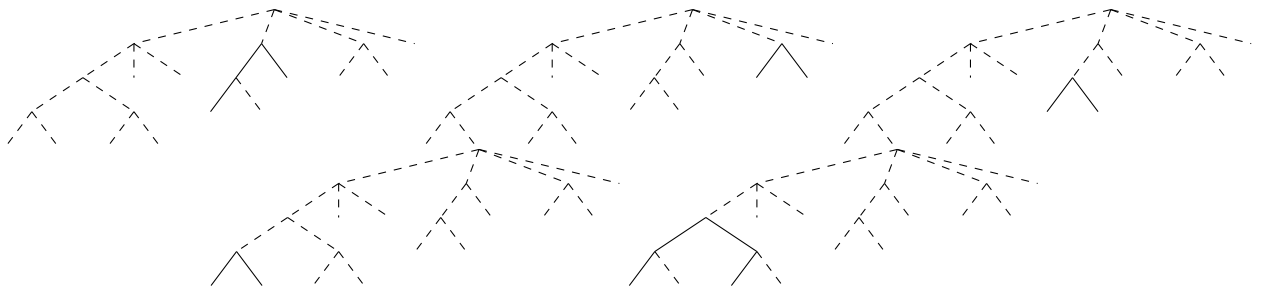
**Topology 197**



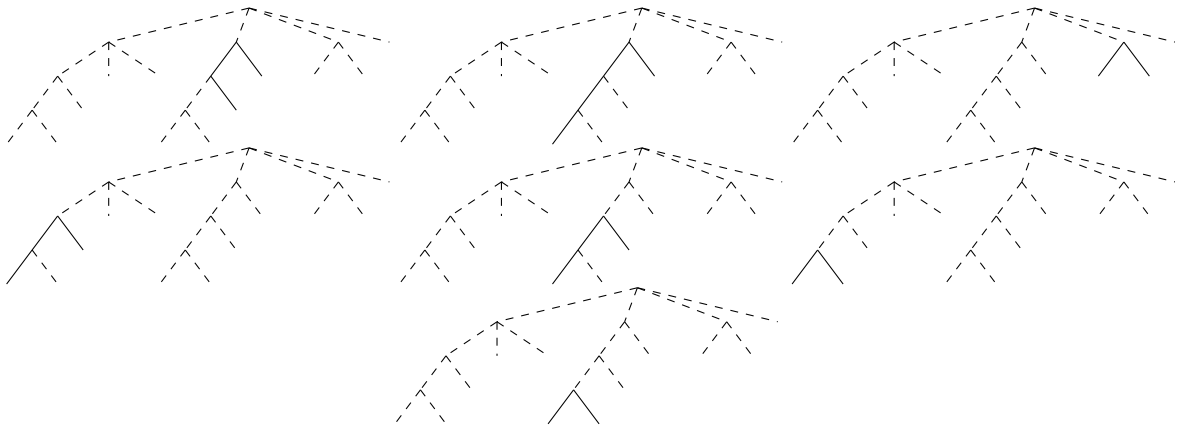
**Topology 198**



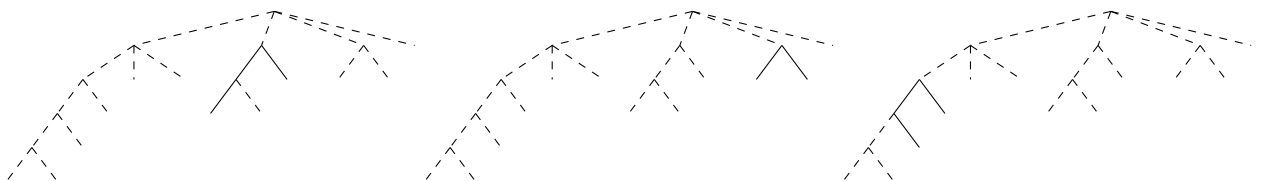
**Topology 199**

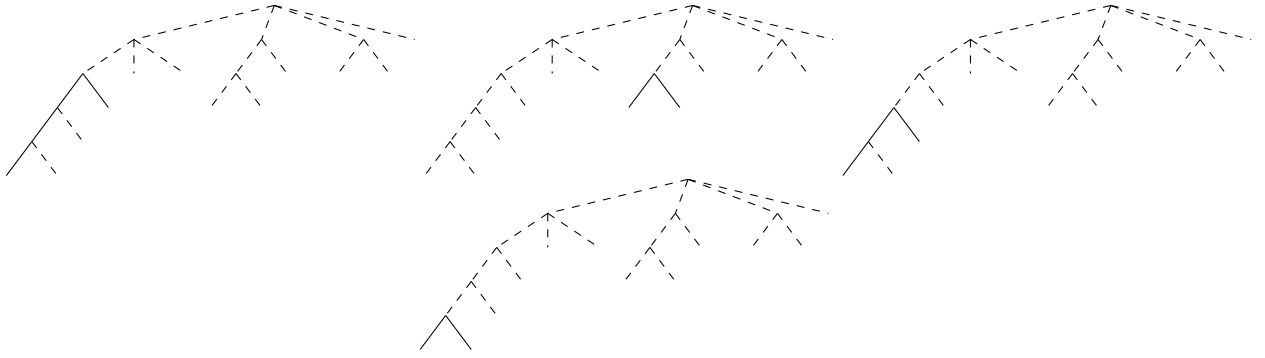


**Topology 200**

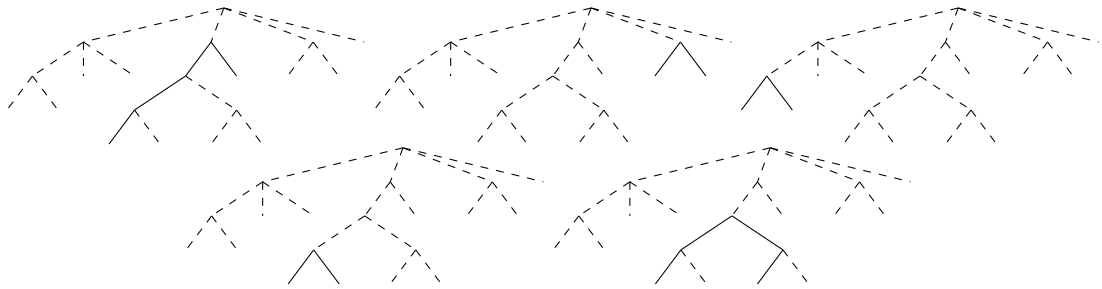


**Topology 201**

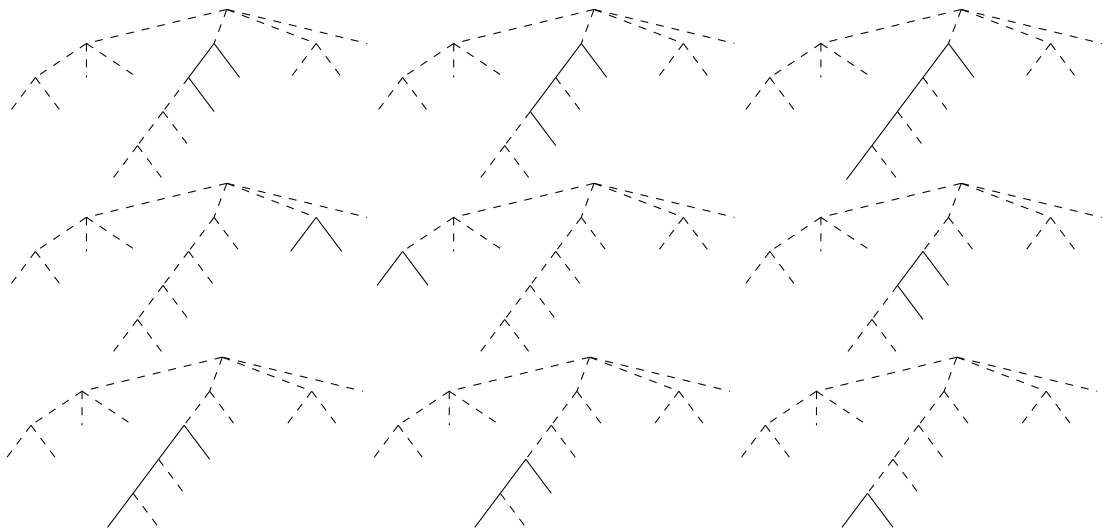




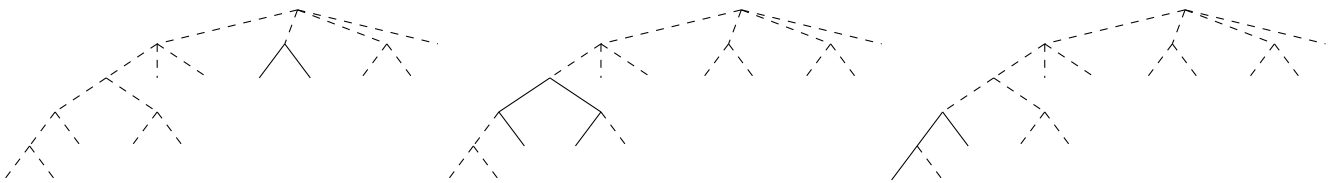
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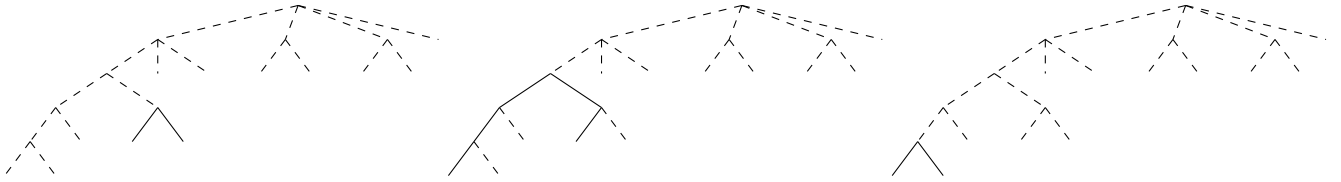
**Topology 203**



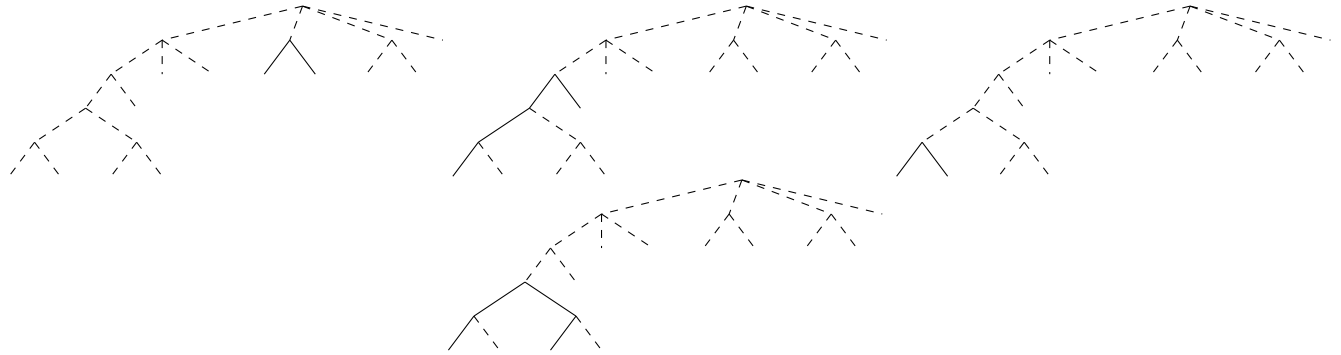
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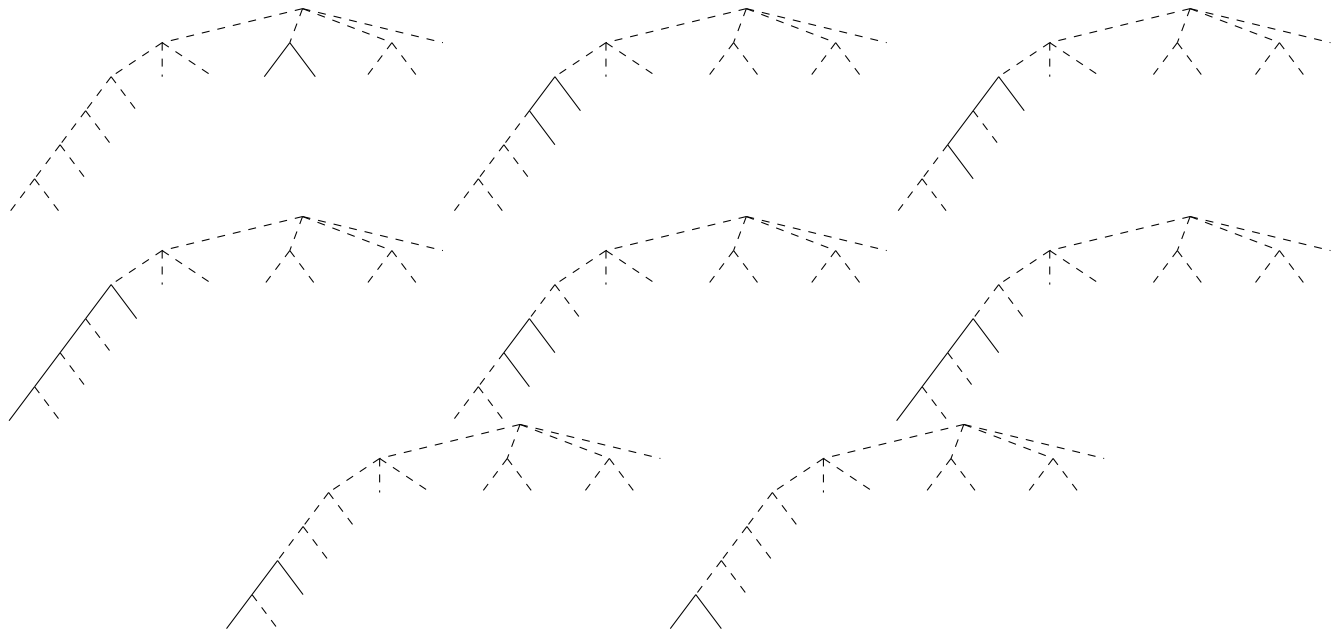




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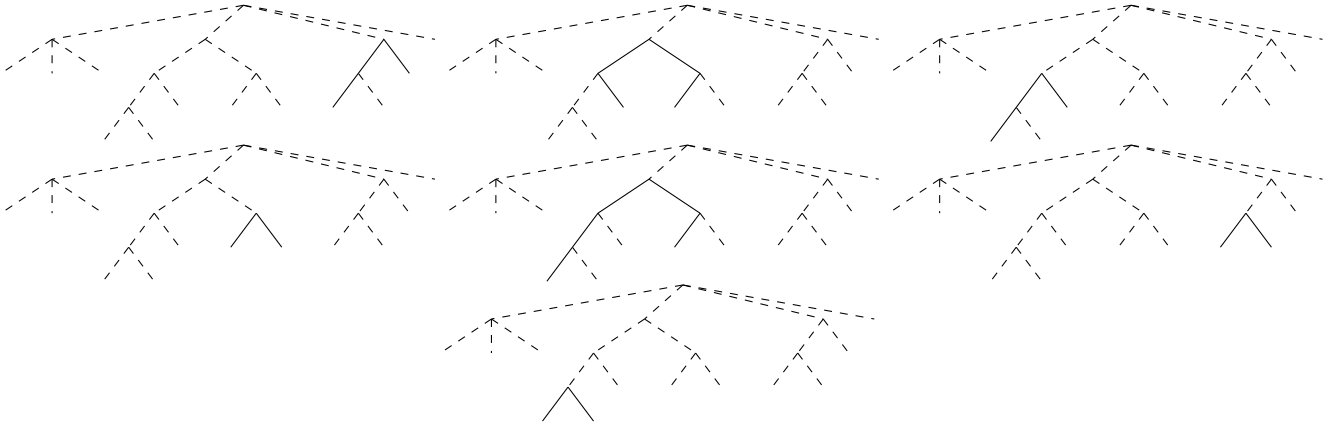
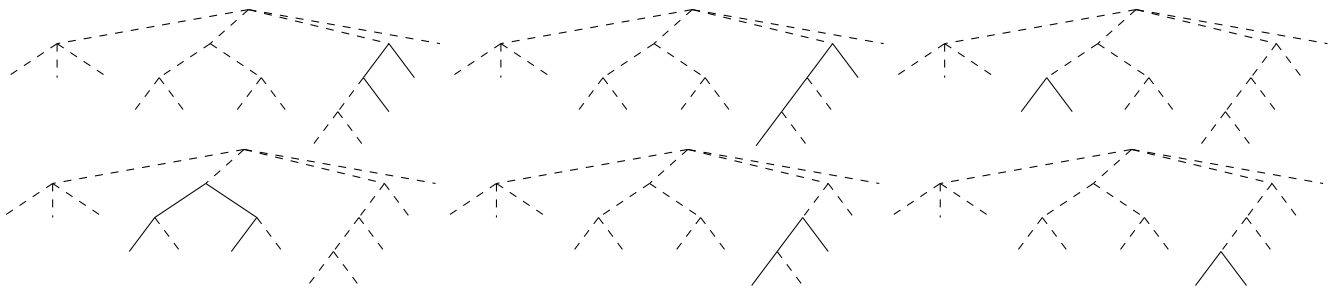
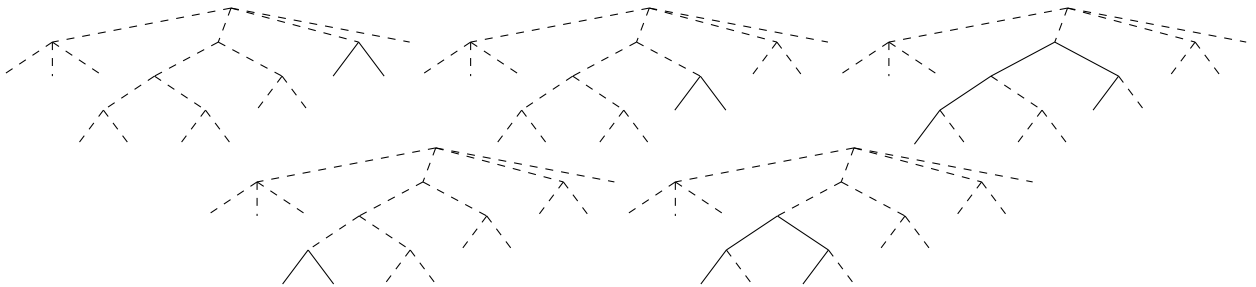
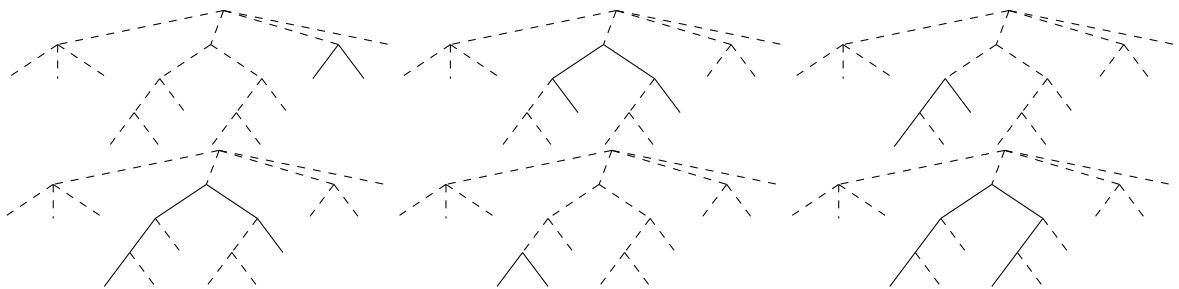


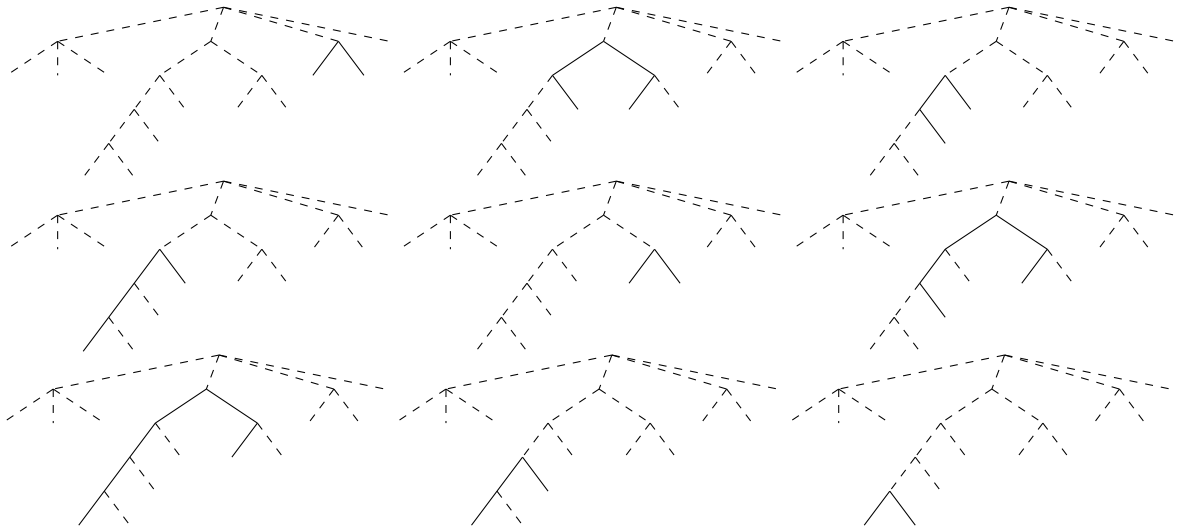
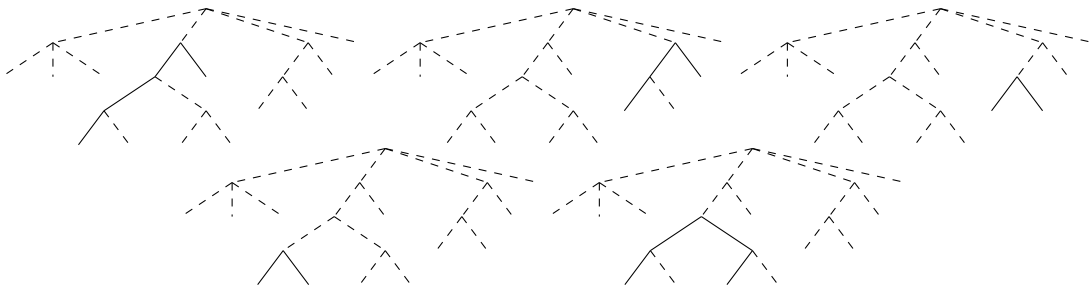
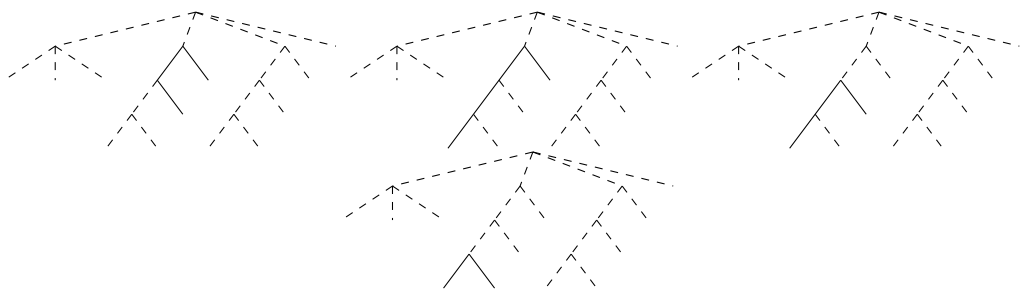
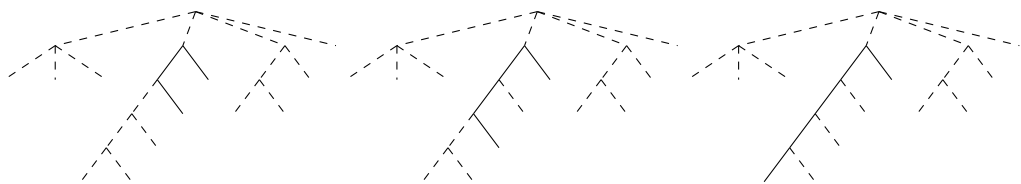
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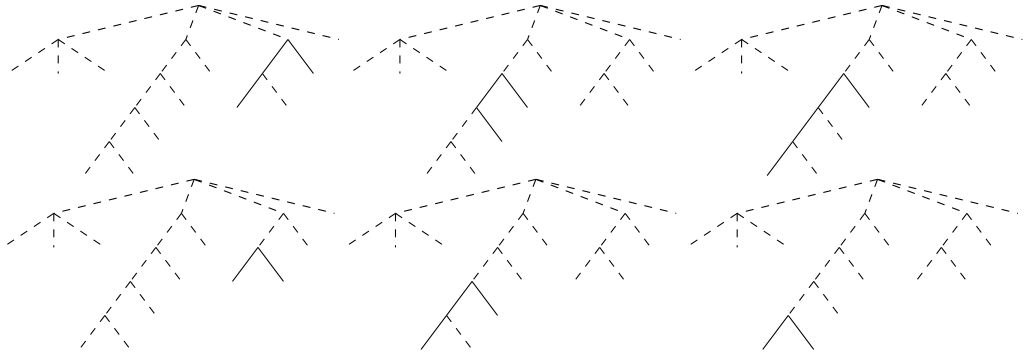
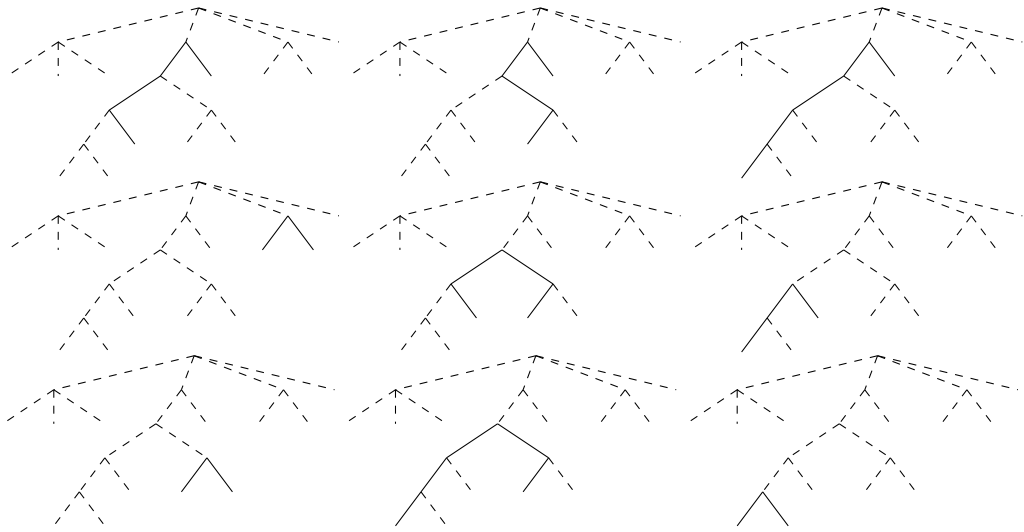
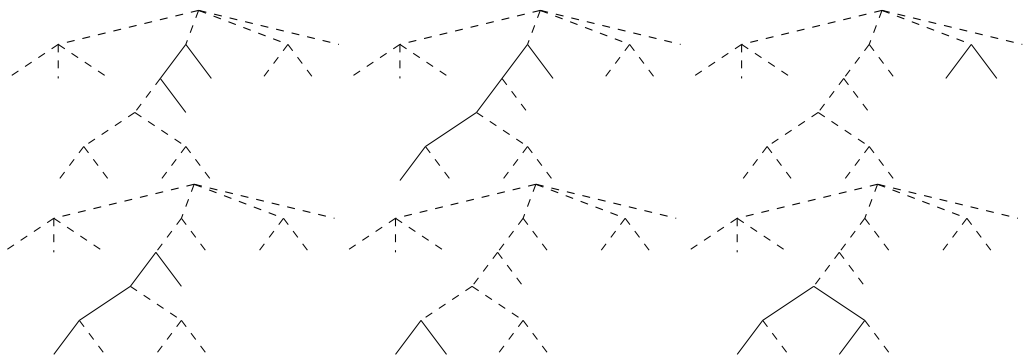


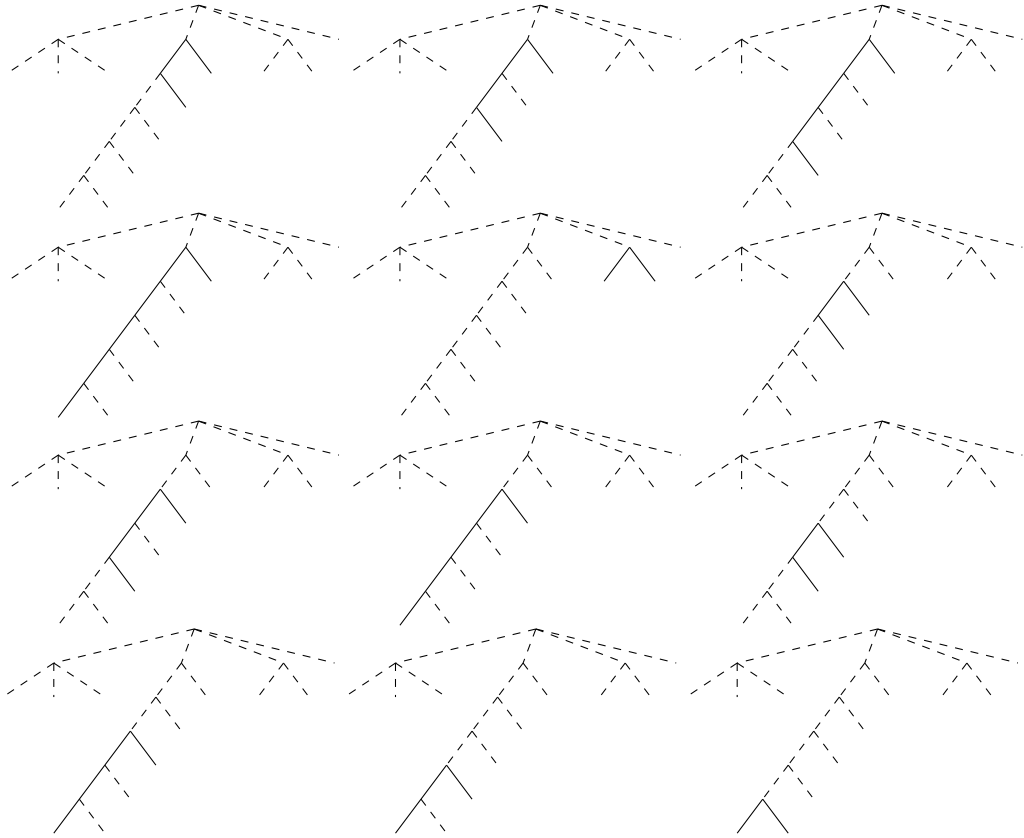
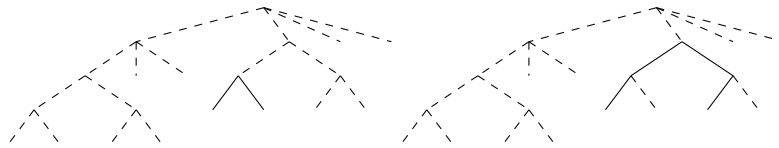
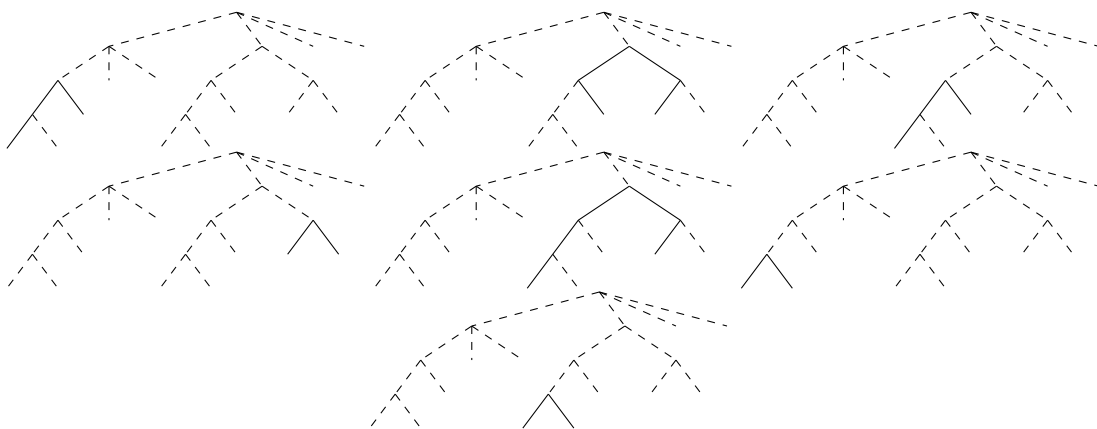
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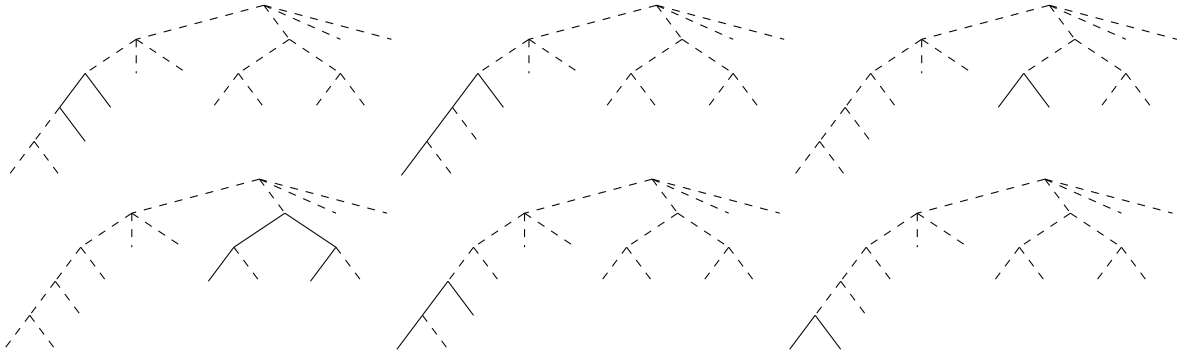
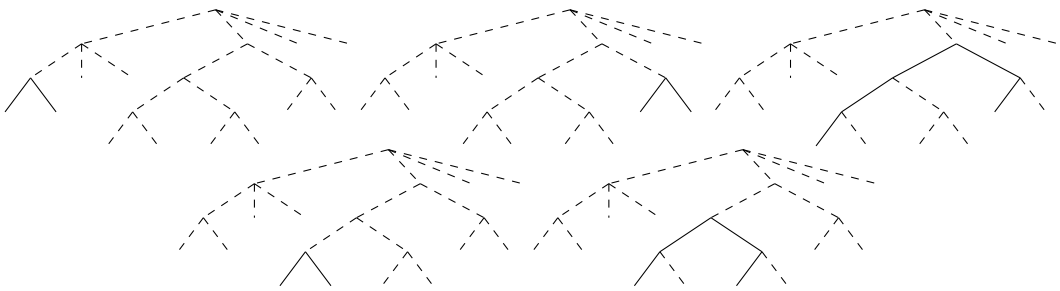
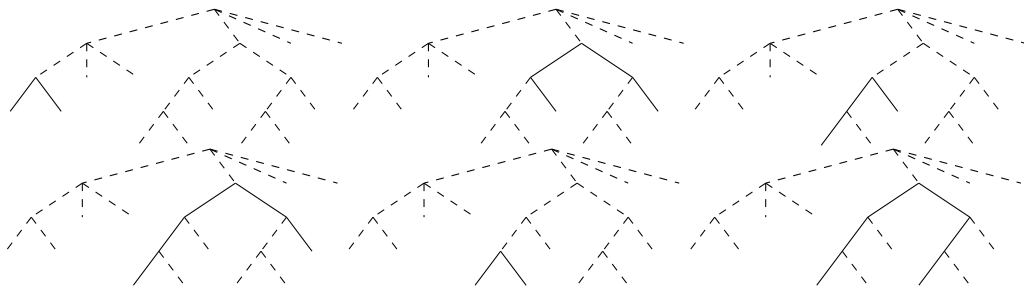
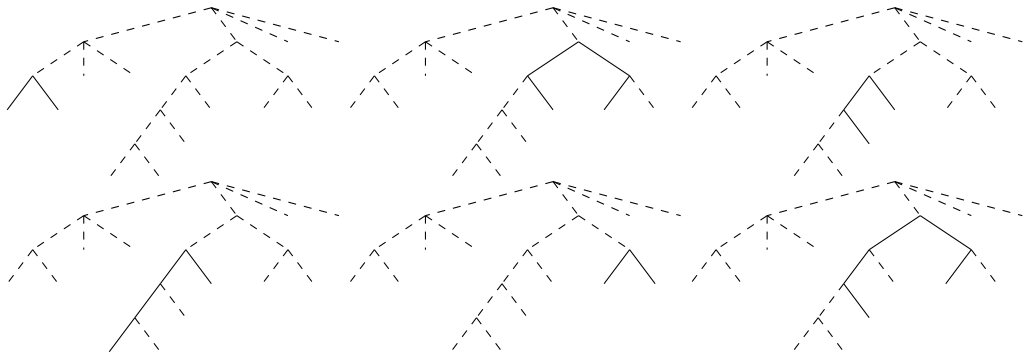


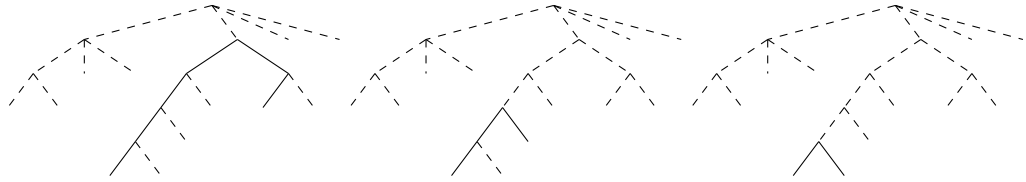
**Topology 208****Topology 209****Topology 210****Topology 211**

**Topology 212****Topology 213****Topology 214****Topology 215**

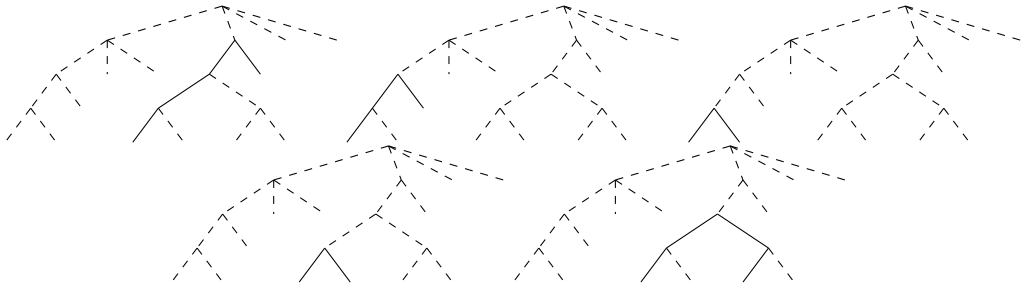
**Topology 216****Topology 217**

**Topology 218****Topology 219****Topology 220**

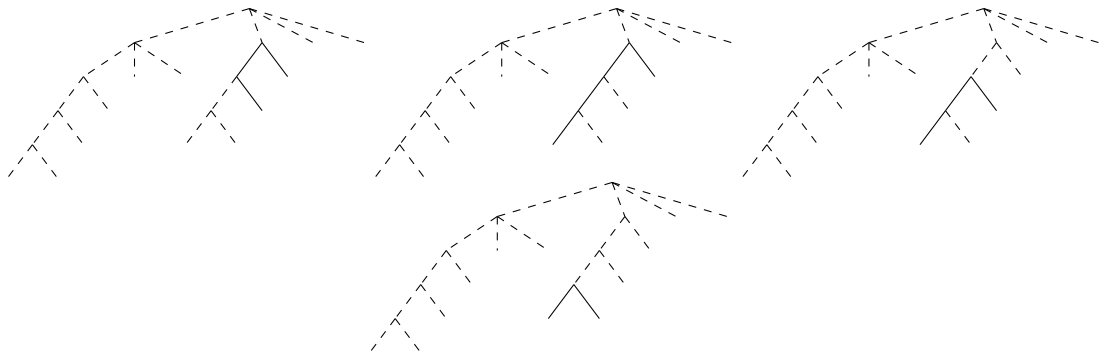
**Topology 221****Topology 222****Topology 223****Topology 224**



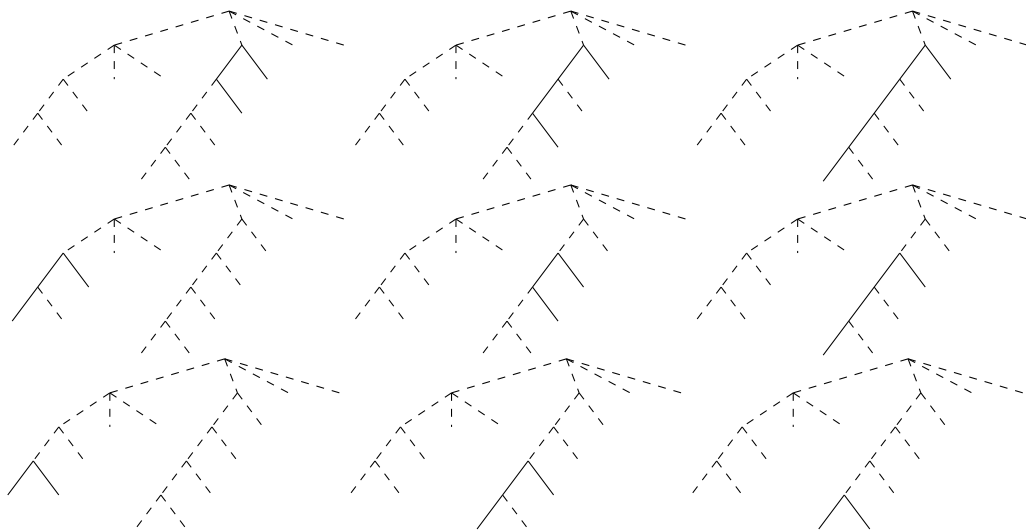
**Topology 225**

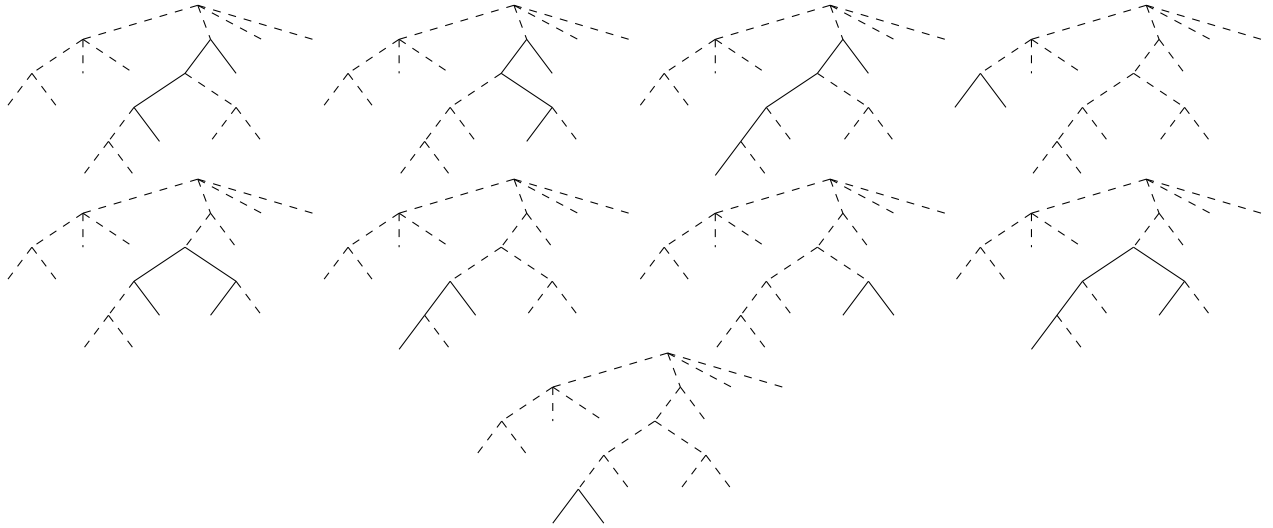
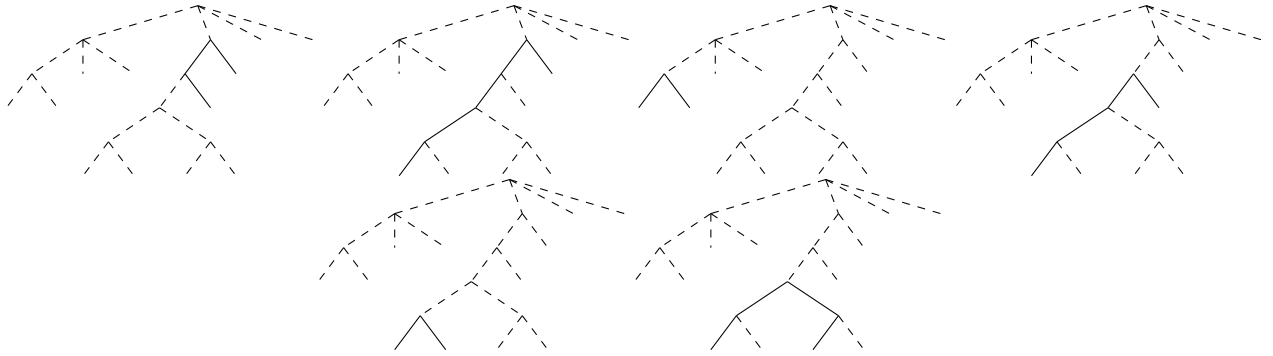
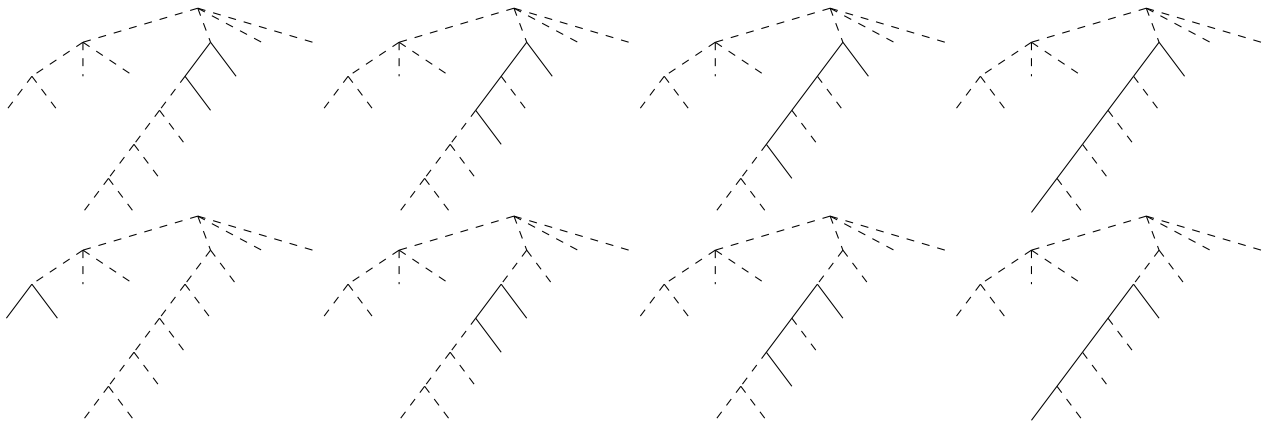


**Topology 226**

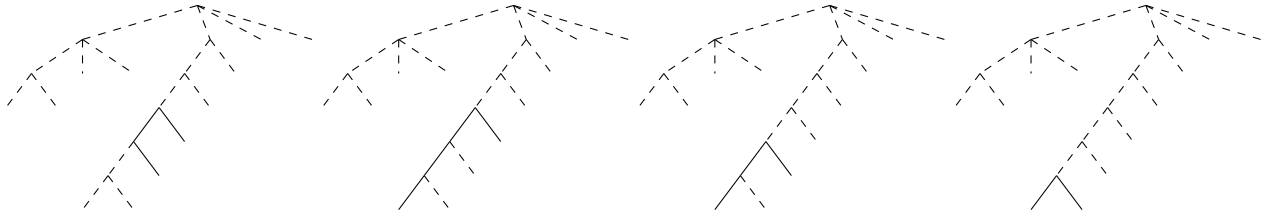


**Topology 227**

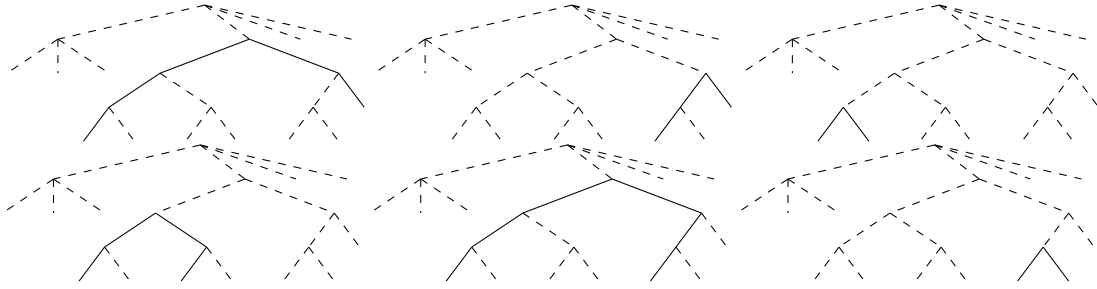


**Topology 228****Topology 229****Topology 230**

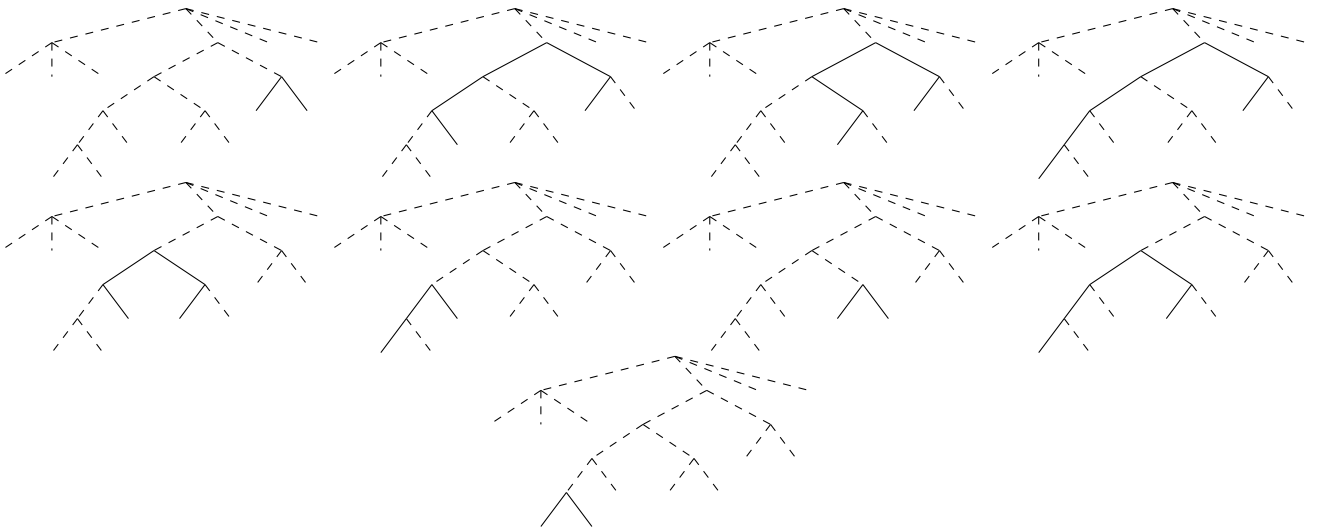




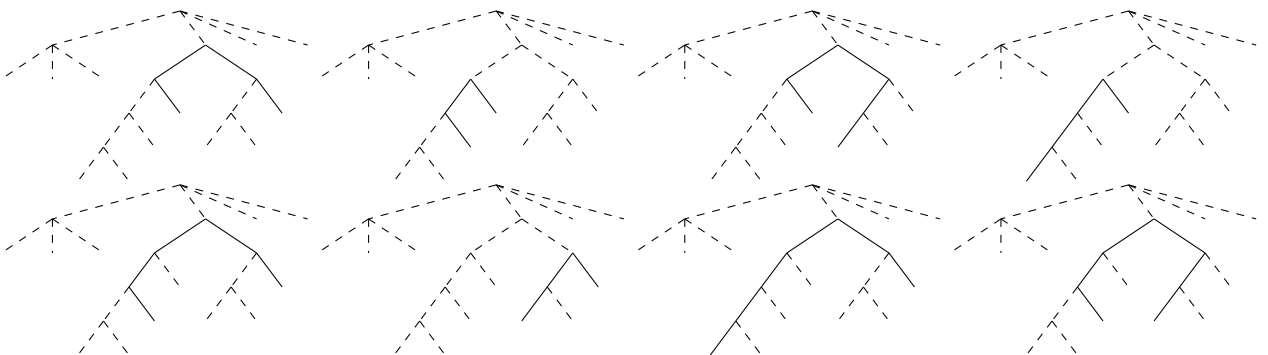
**Topology 231**

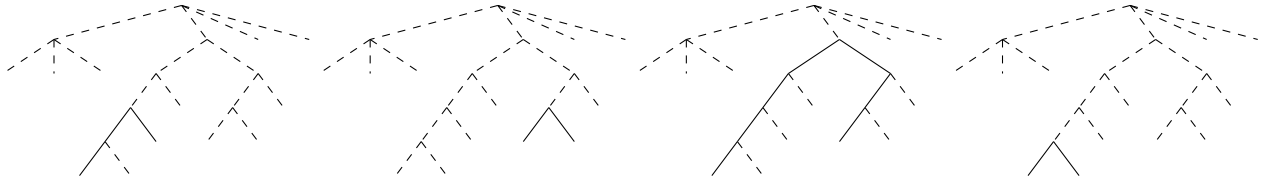


**Topology 232**

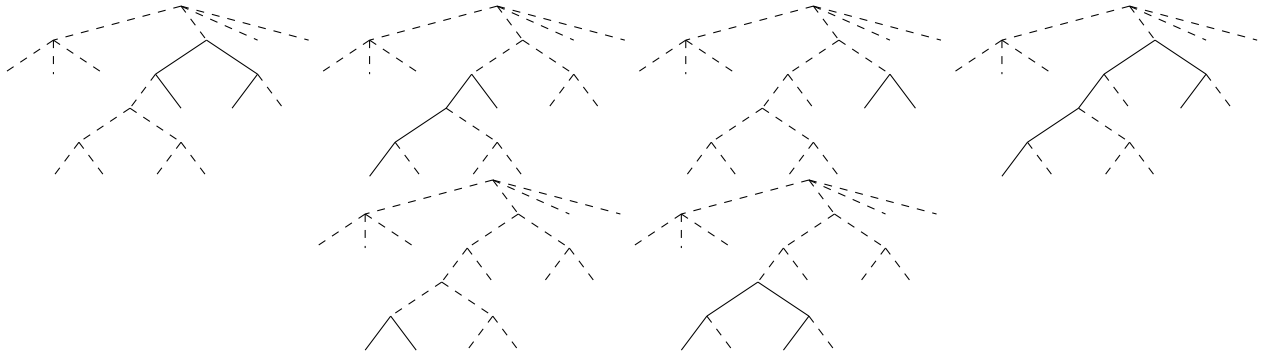


**Topology 233**

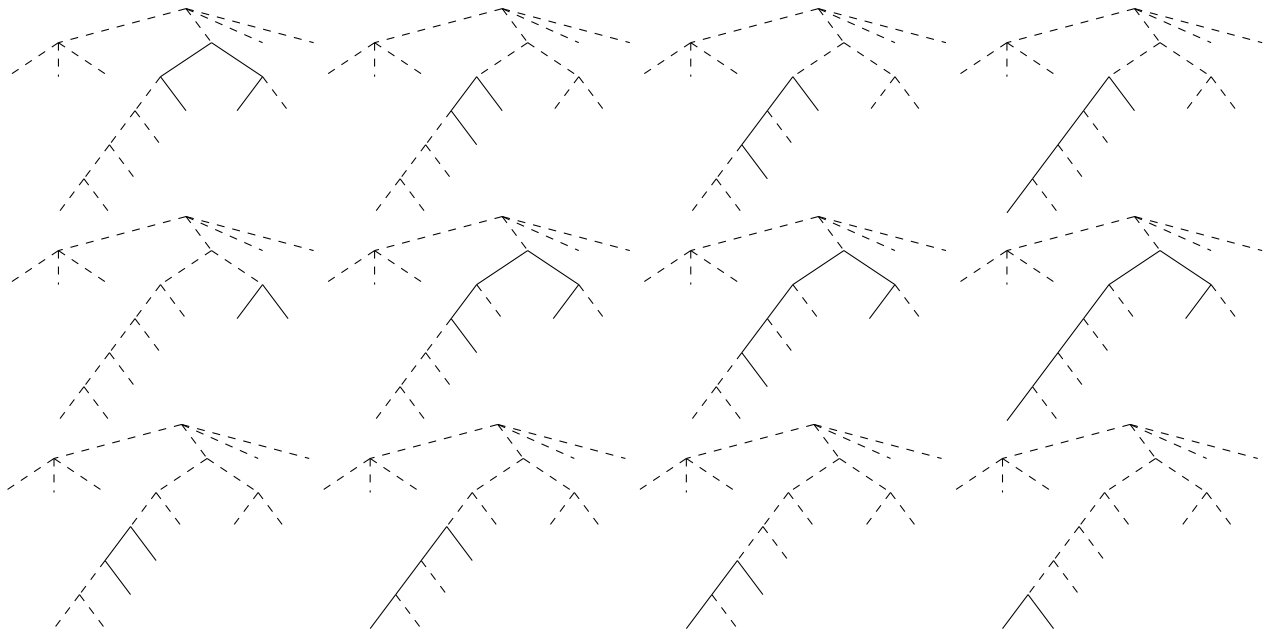




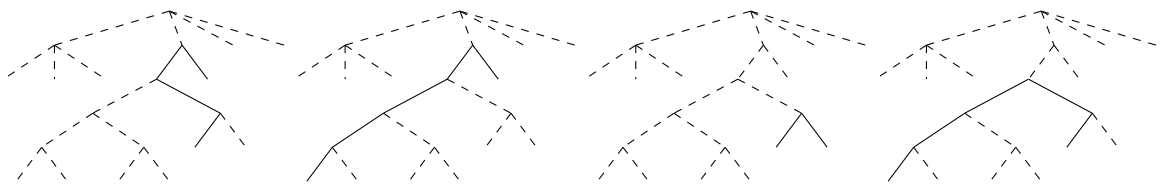
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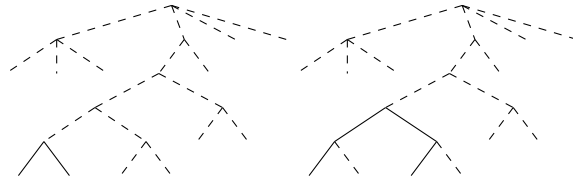


**Topology 235**

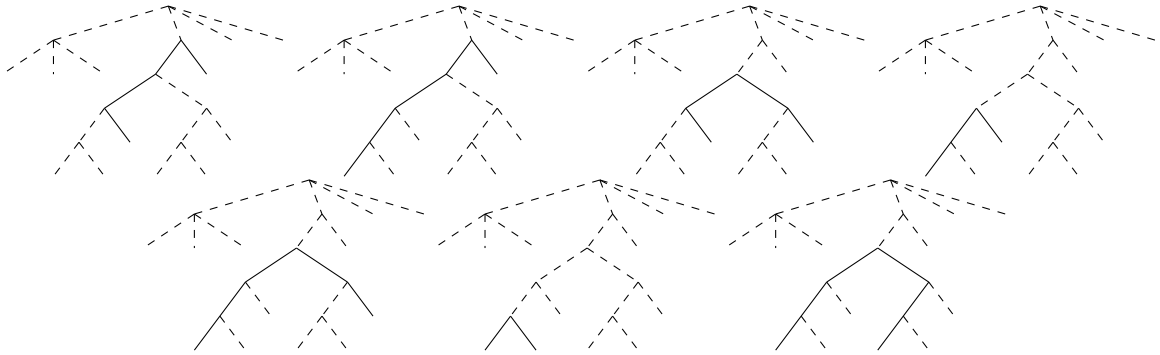


**Topology 236**

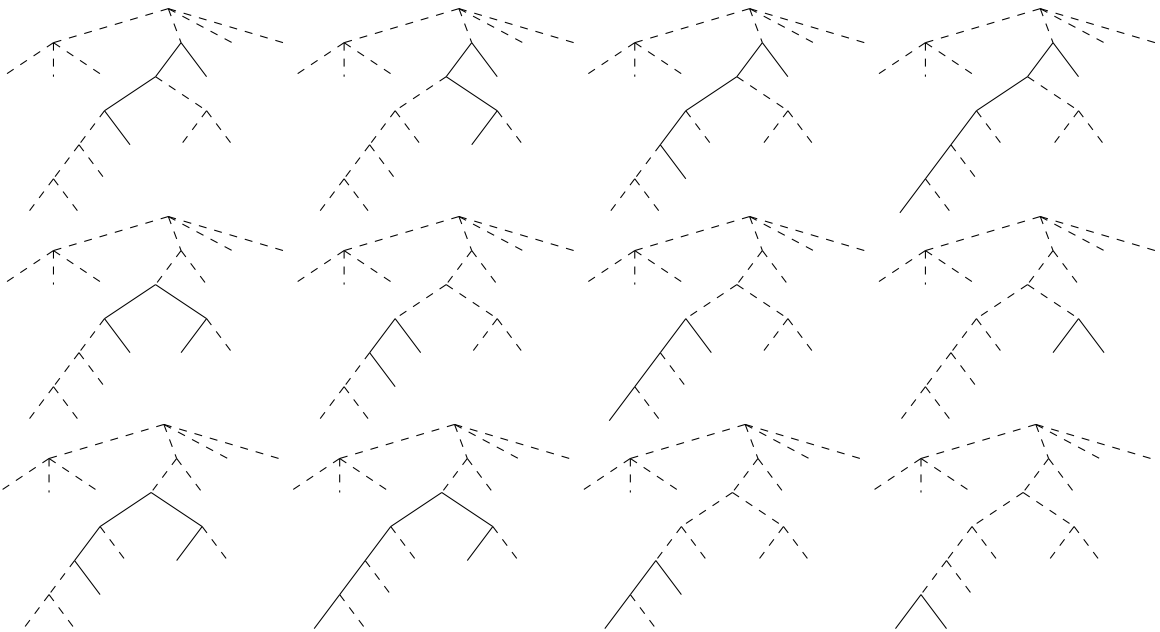




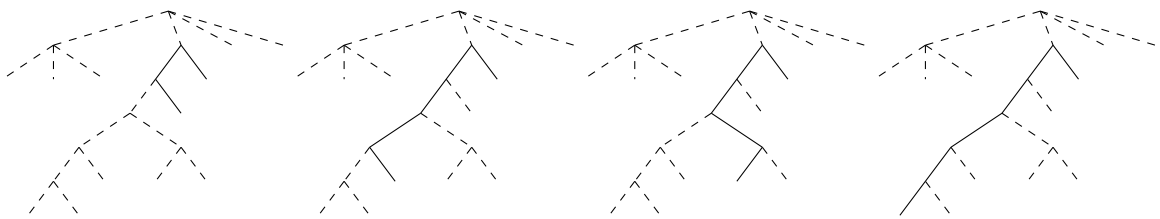
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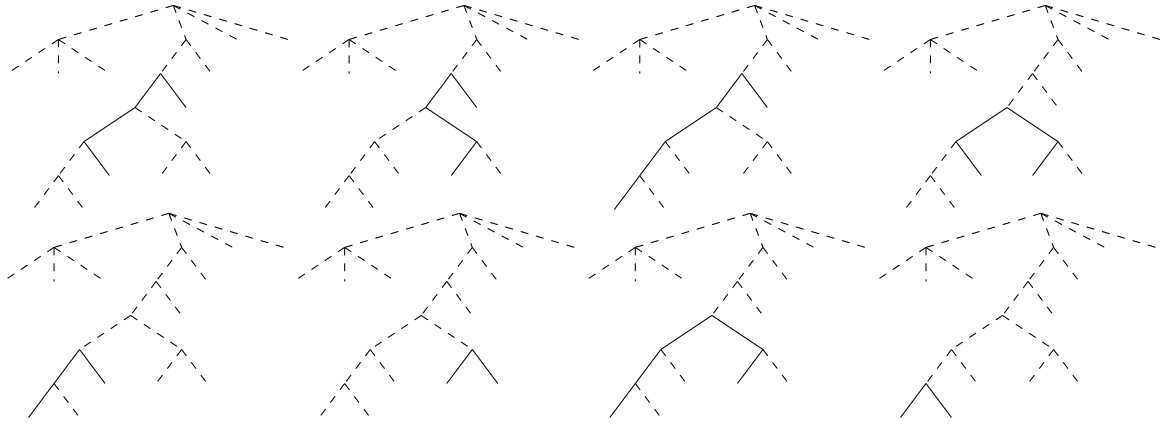
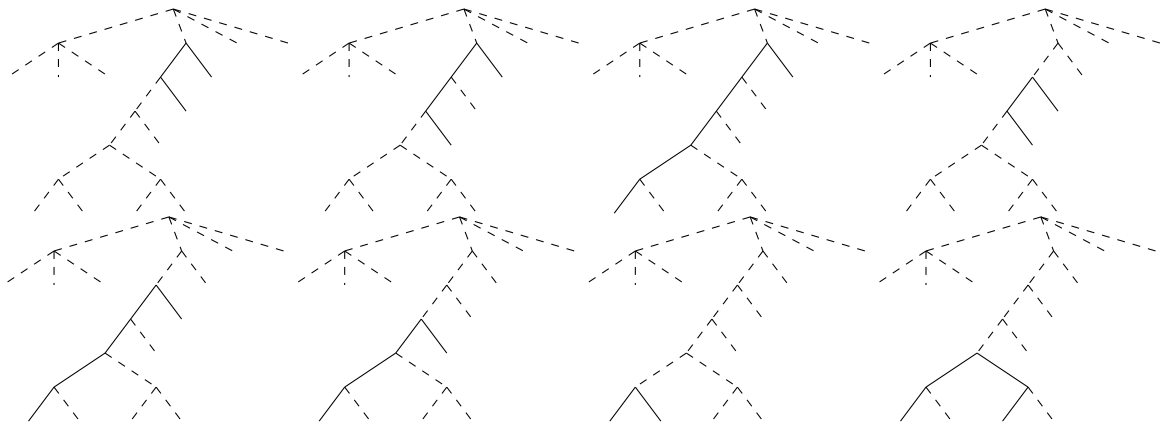
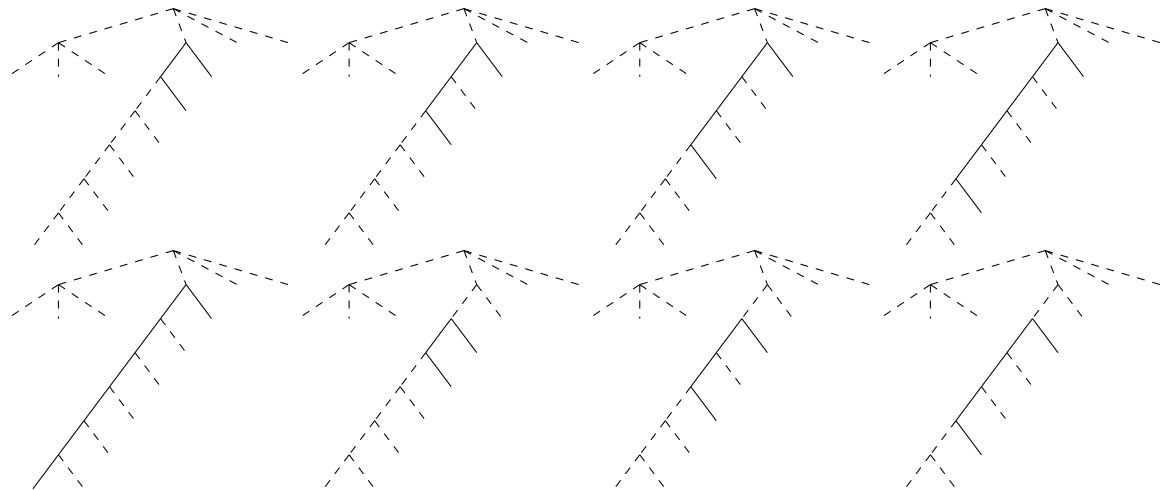


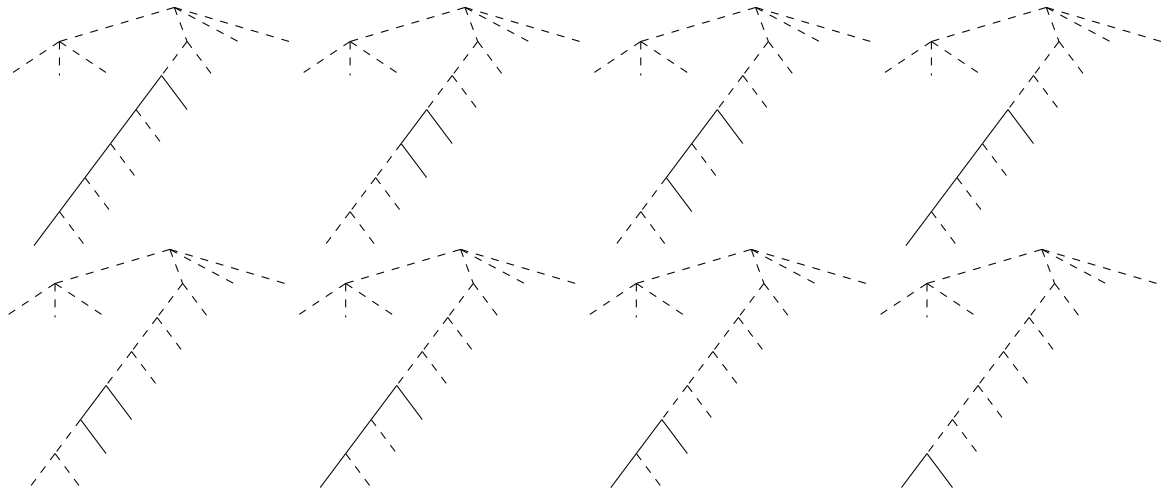
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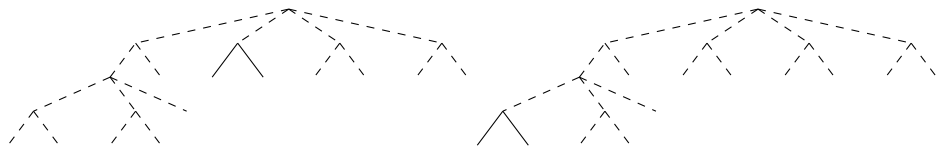
**Topology 239**



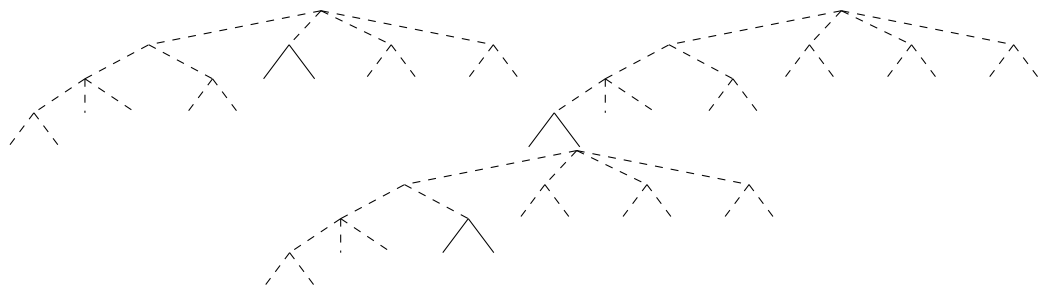
**Topology 240****Topology 241**



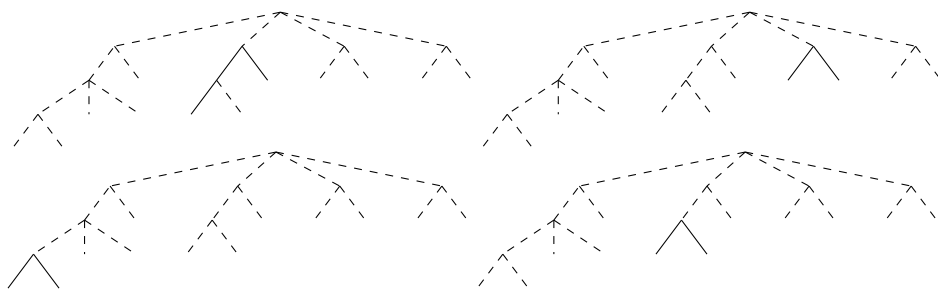
**Topology 242**



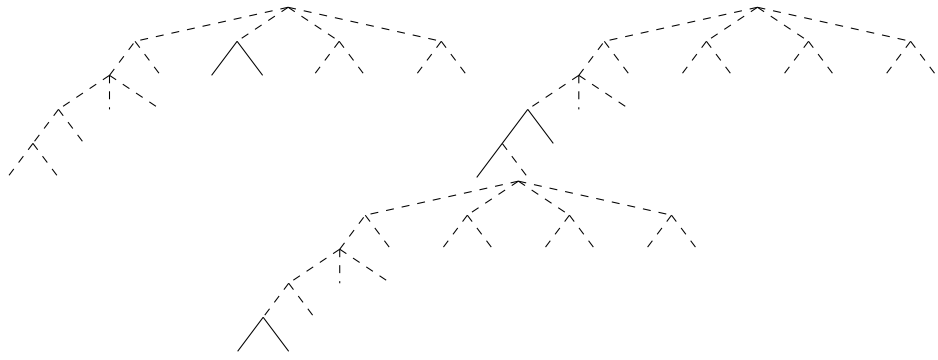
**Topology 243**



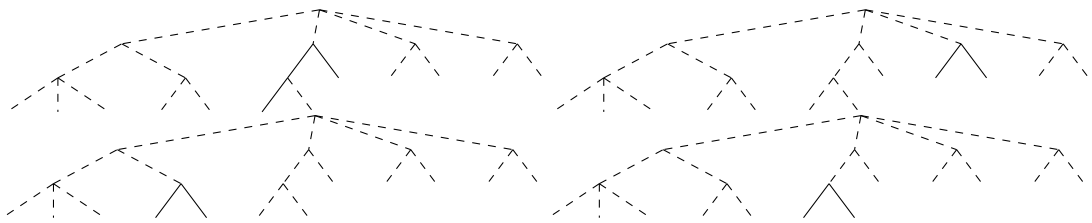
**Topology 244**



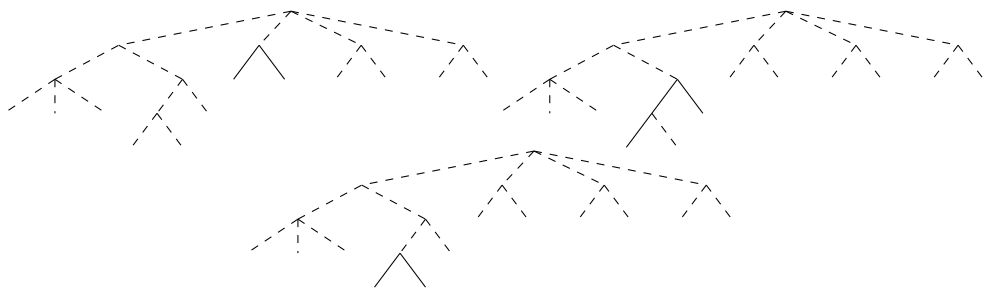
**Topology 245**



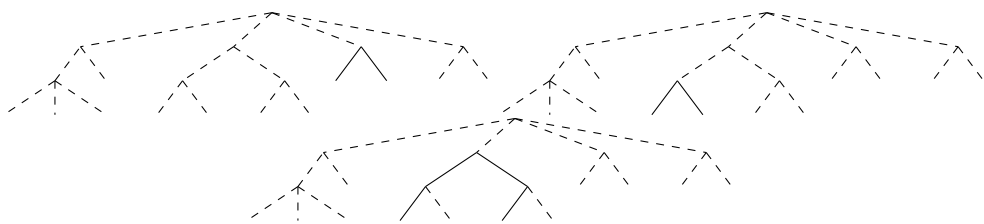
**Topology 246**



**Topology 247**

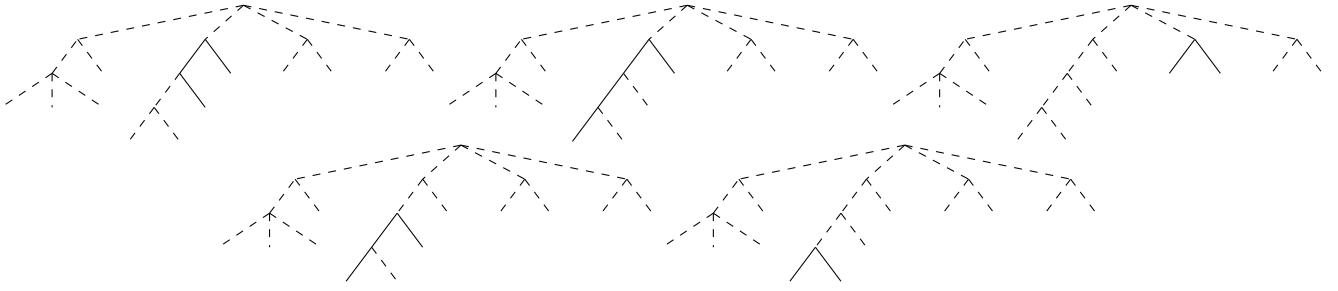
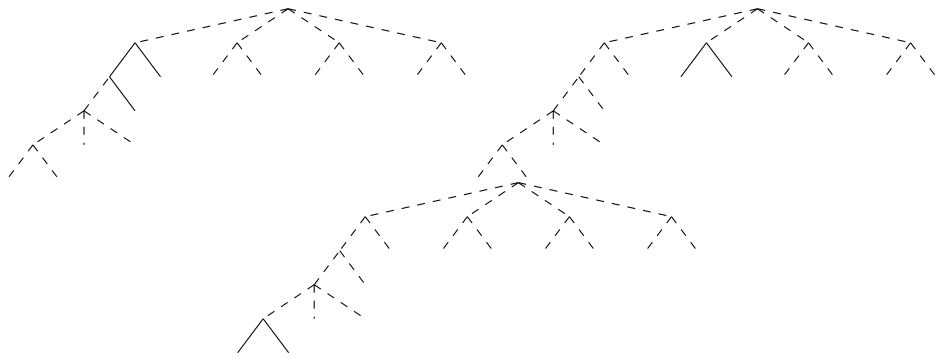
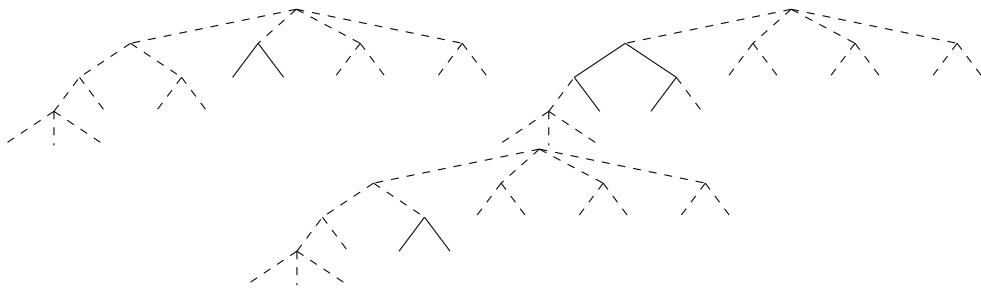
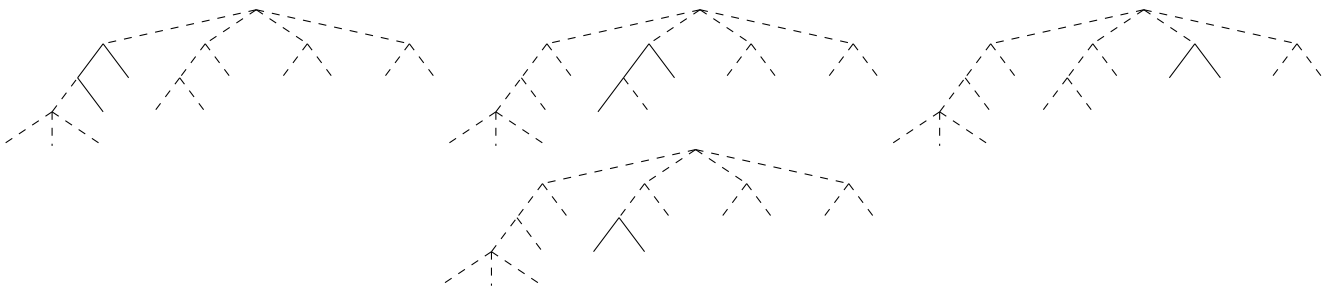


**Topology 248**

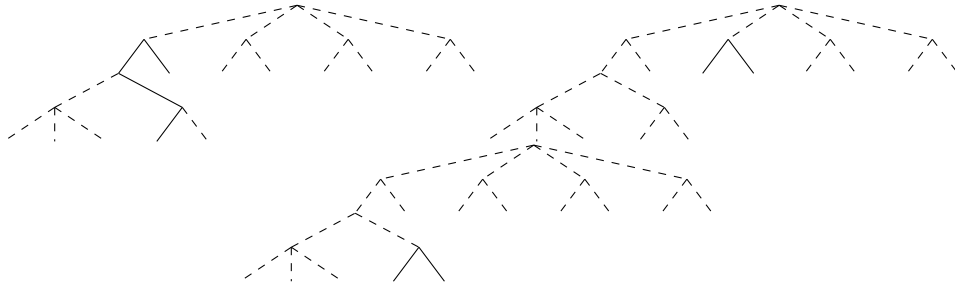


**Topology 249**

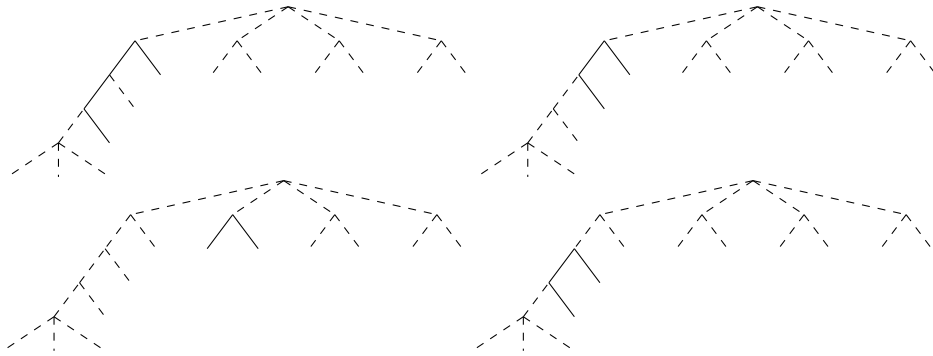


**Topology 250****Topology 251****Topology 252****Topology 253**

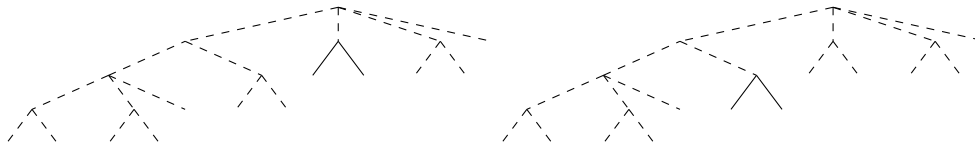
**Topology 254**



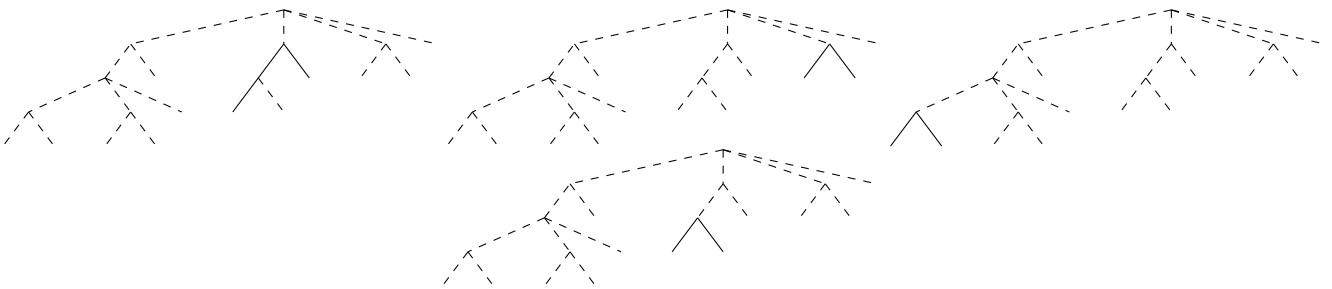
**Topology 255**



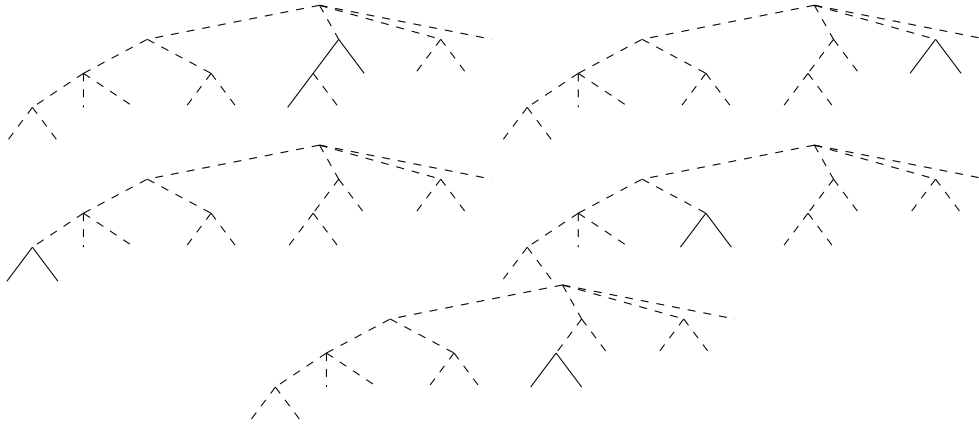
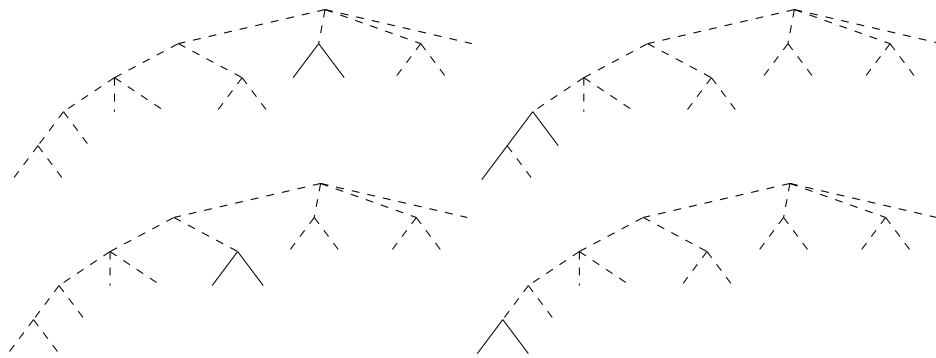
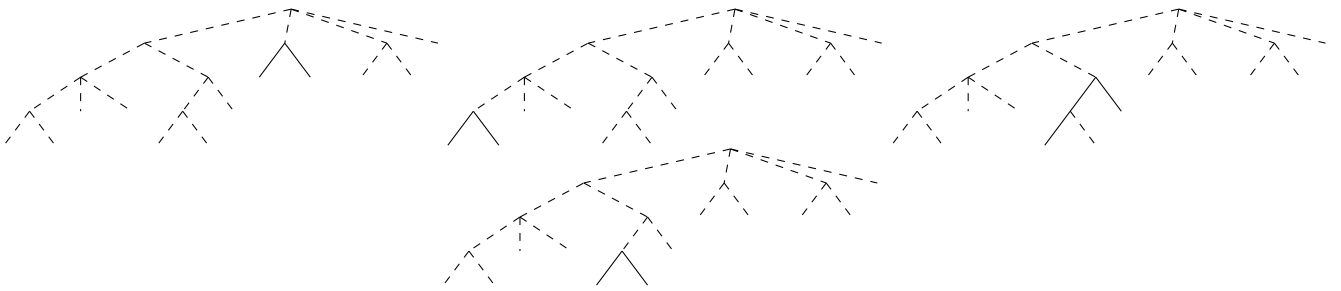
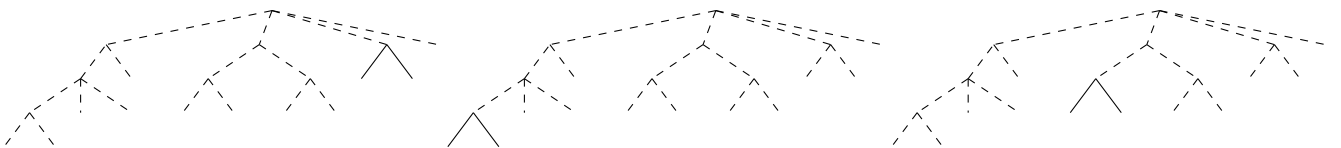
**Topology 256**

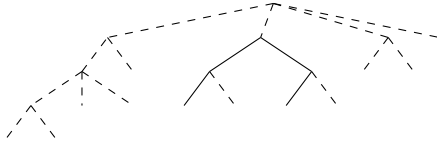


**Topology 257**

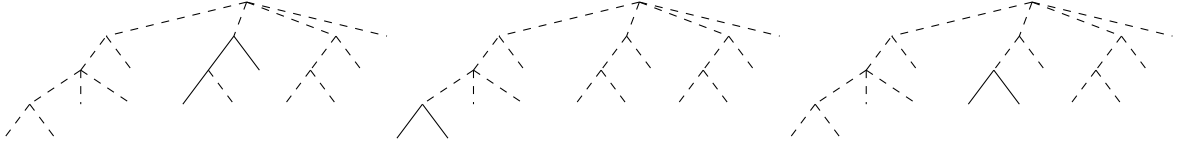




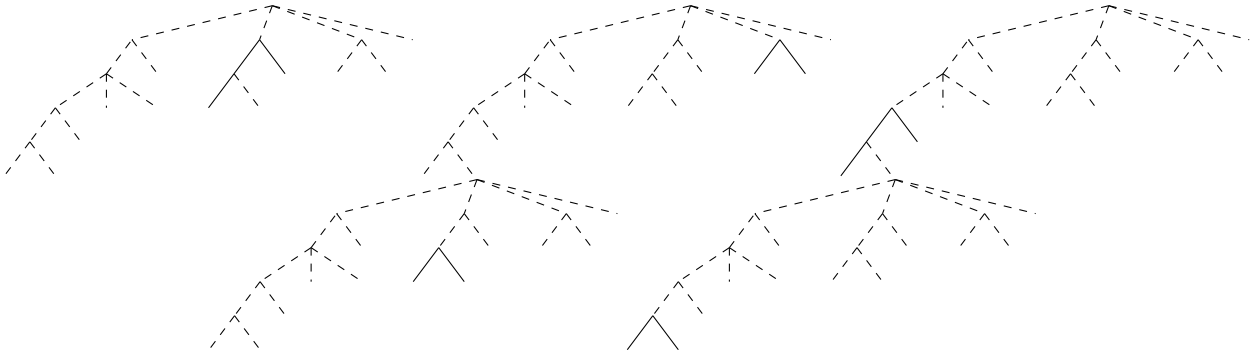
**Topology 258****Topology 259****Topology 260****Topology 261**



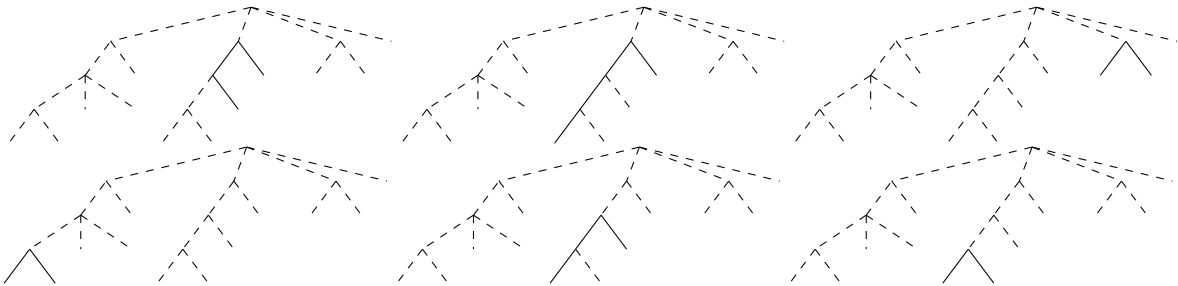
**Topology 262**



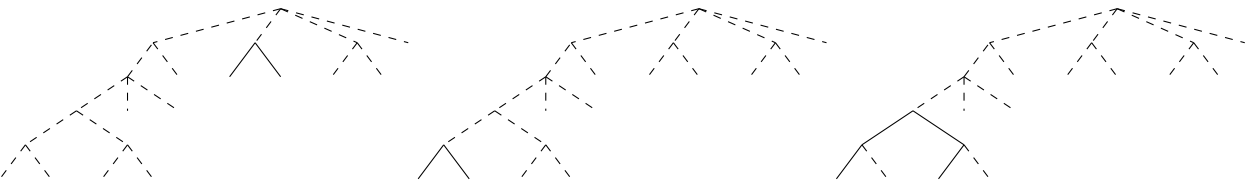
**Topology 263**



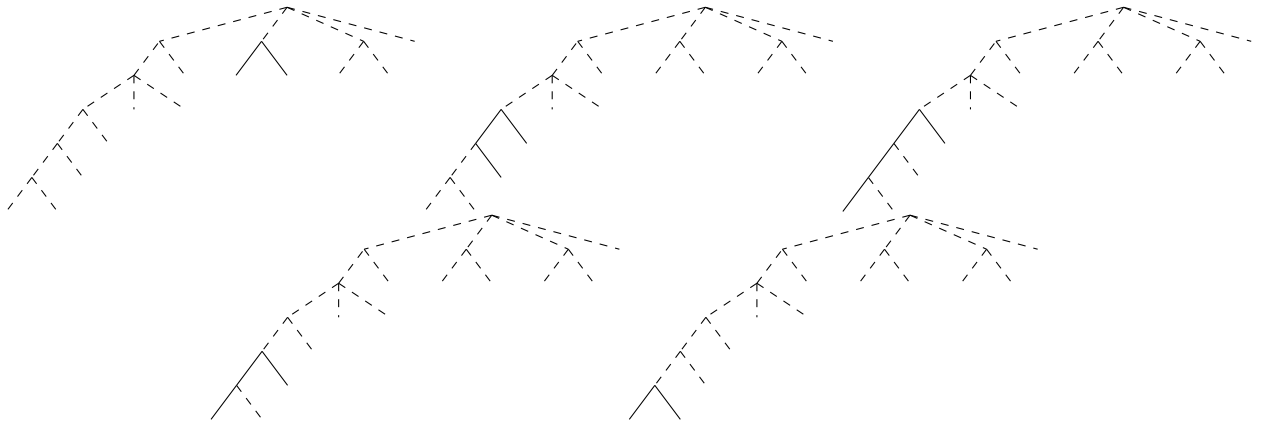
**Topology 264**



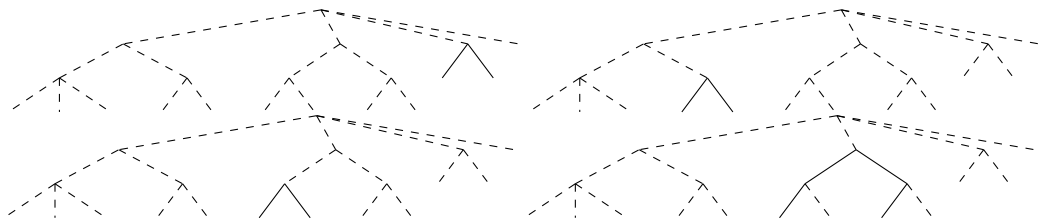
**Topology 265**



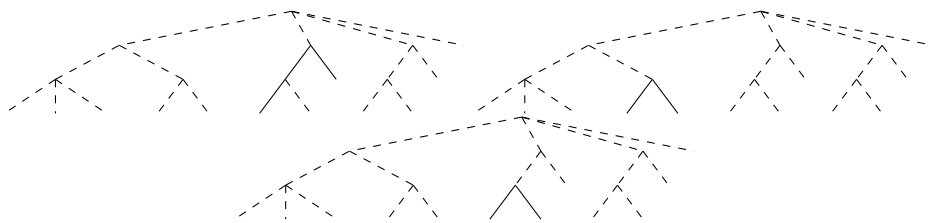
**Topology 266**



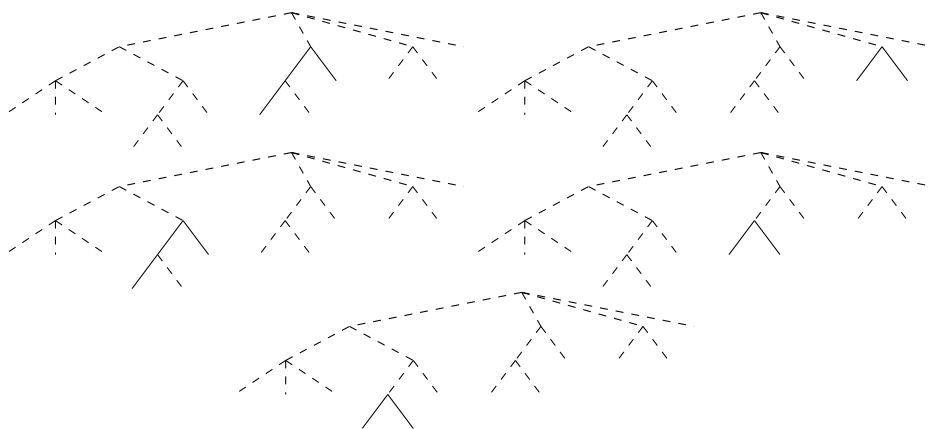
**Topology 267**



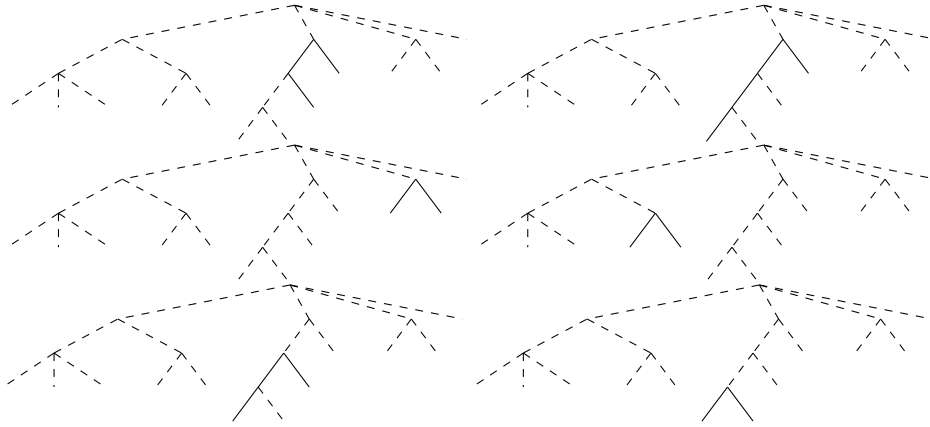
**Topology 268**



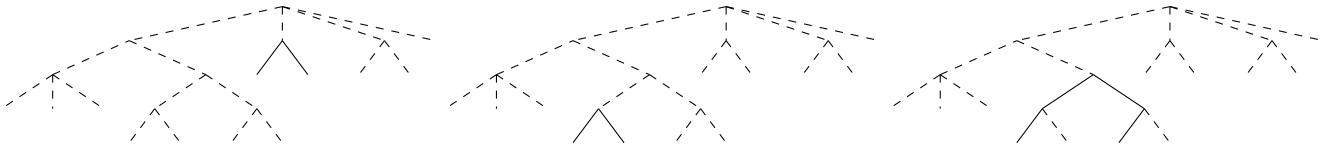
**Topology 269**



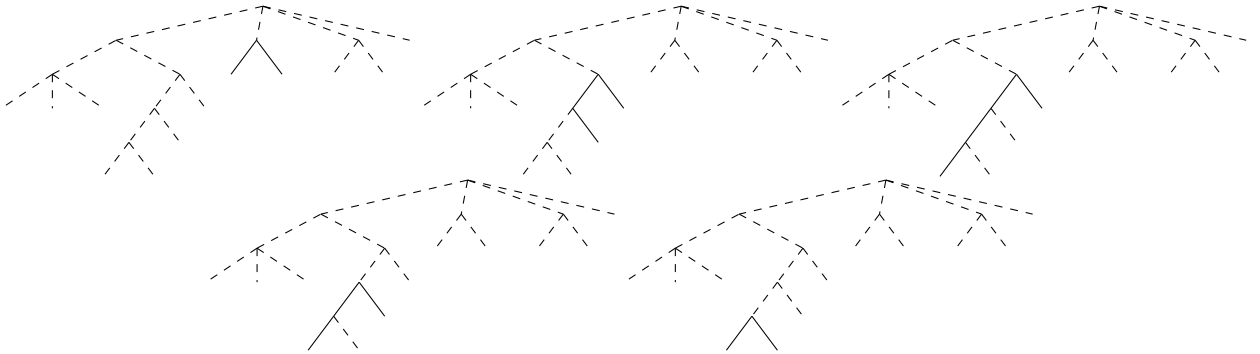
**Topology 270**



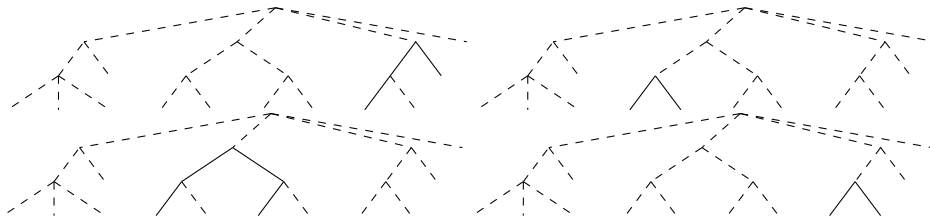
**Topology 271**



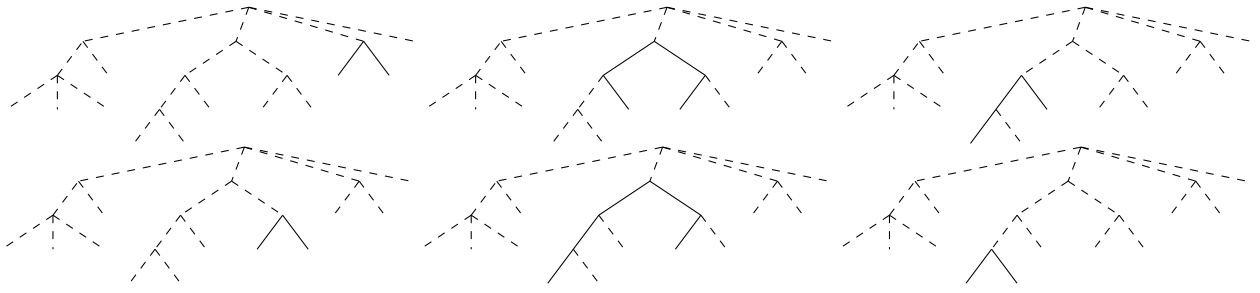
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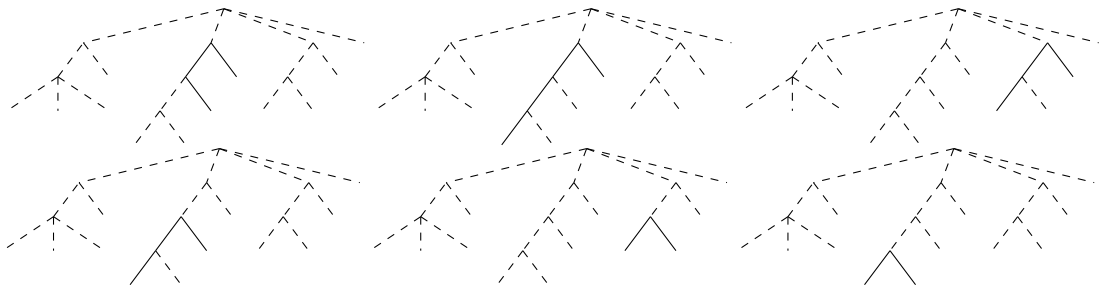
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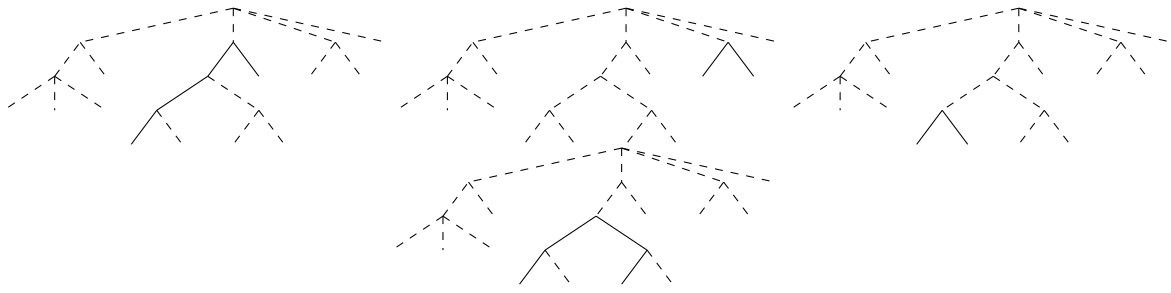
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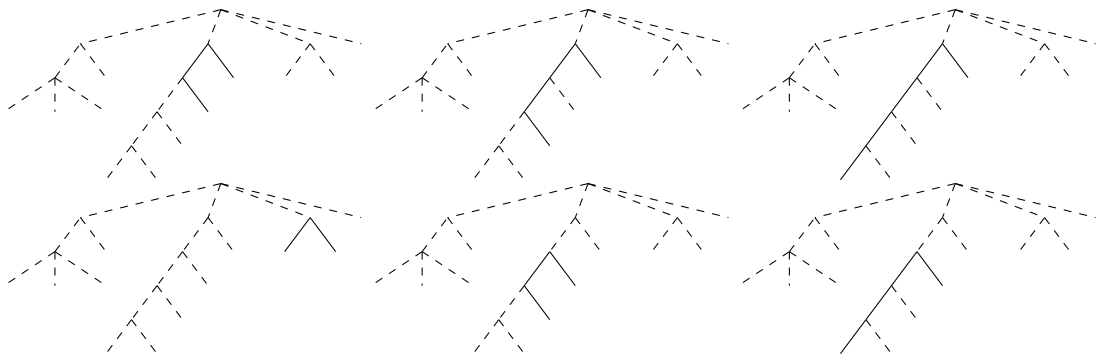
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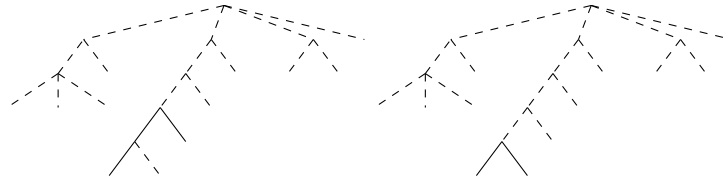


**Topology 276**

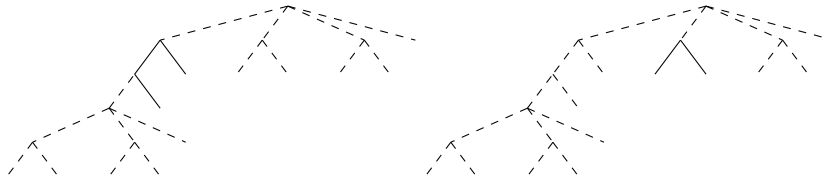


**Topology 277**

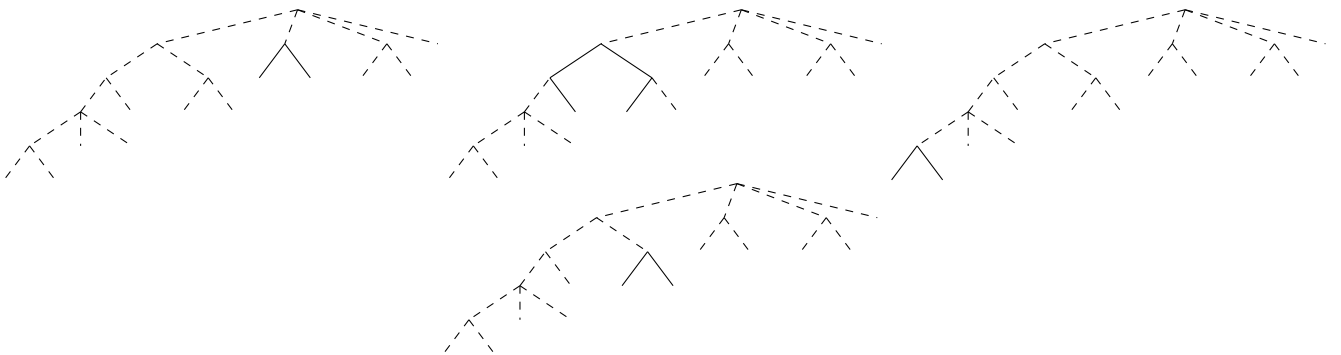




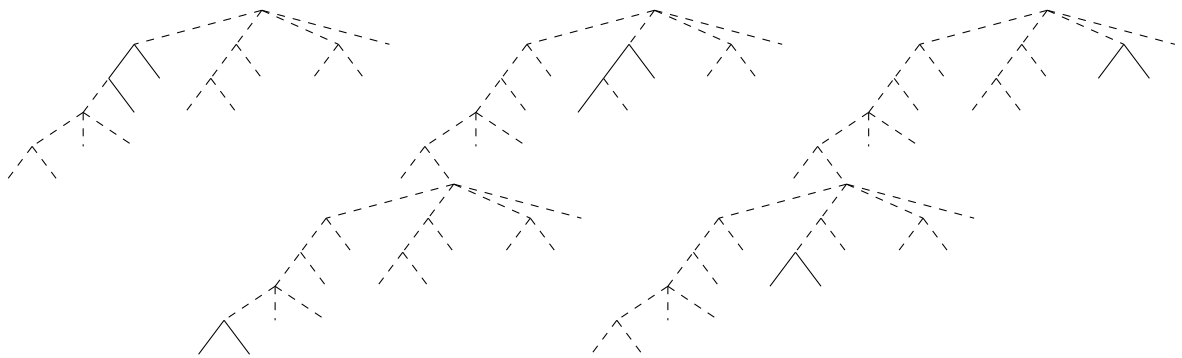
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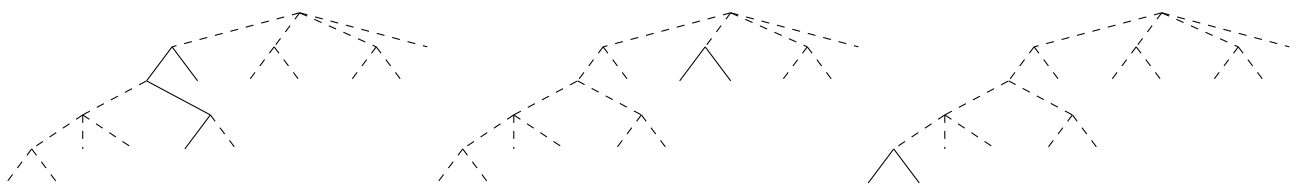
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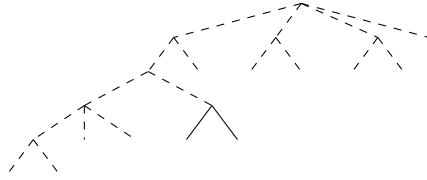


**Topology 280**

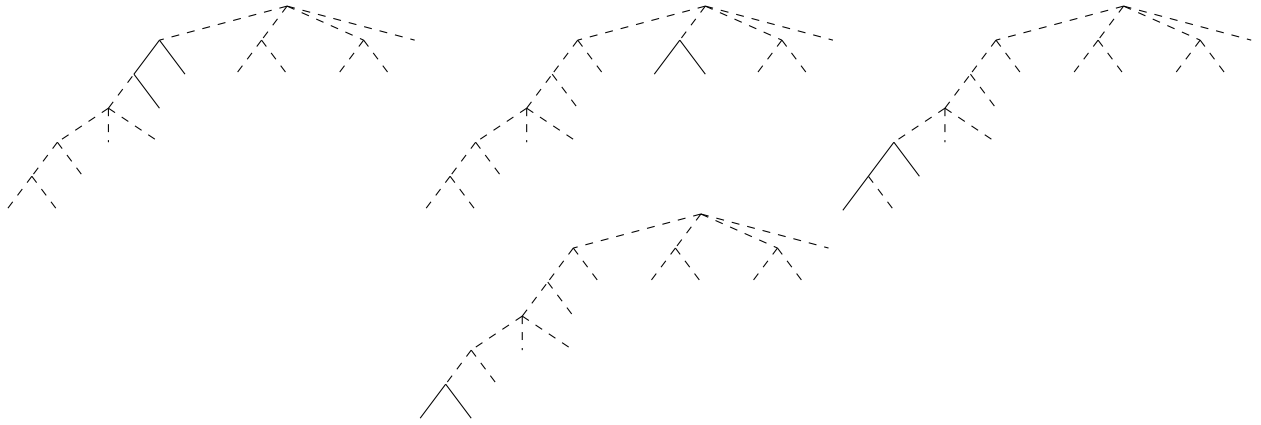


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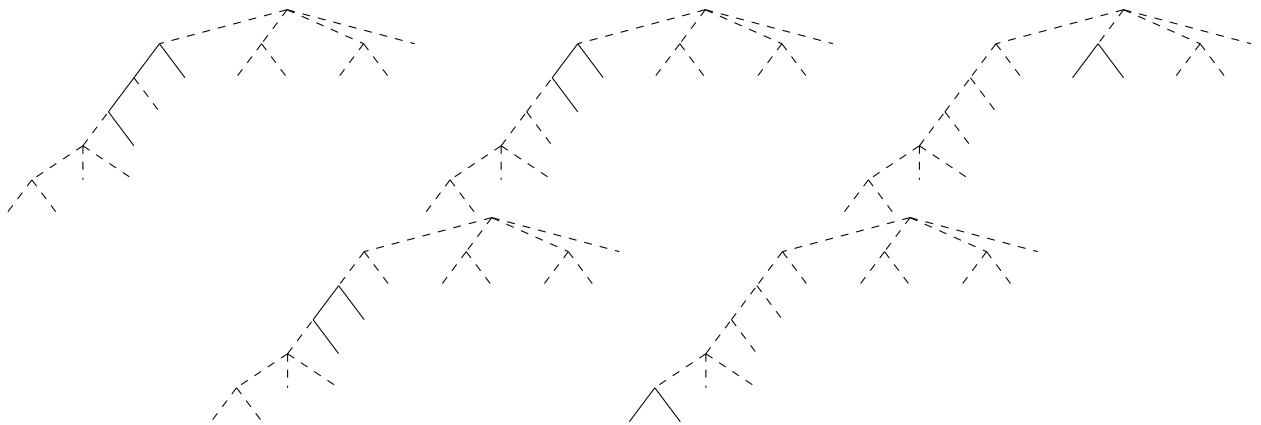




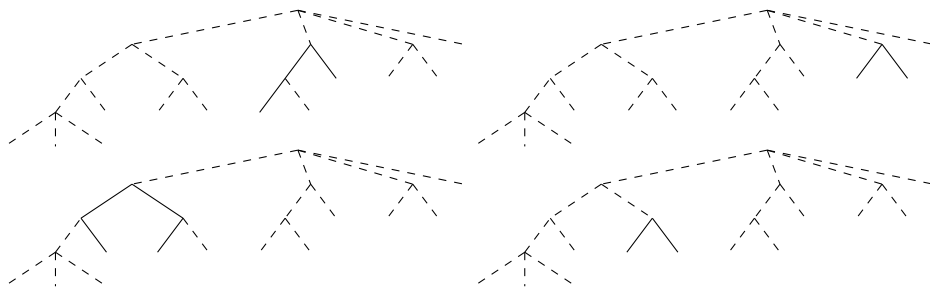
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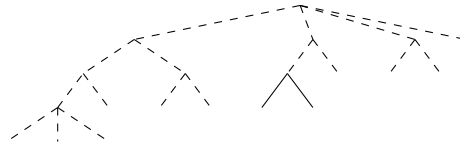


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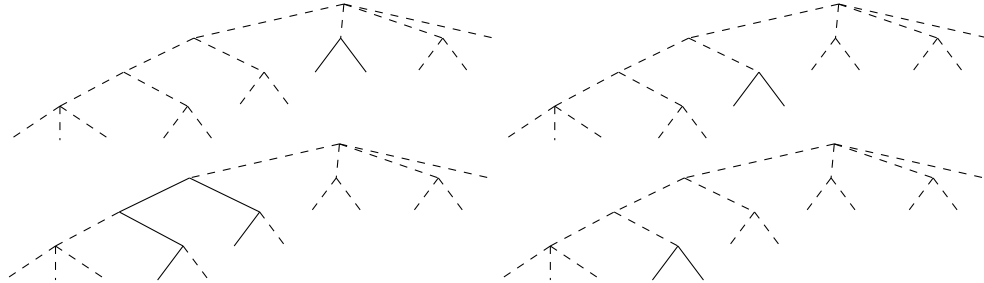


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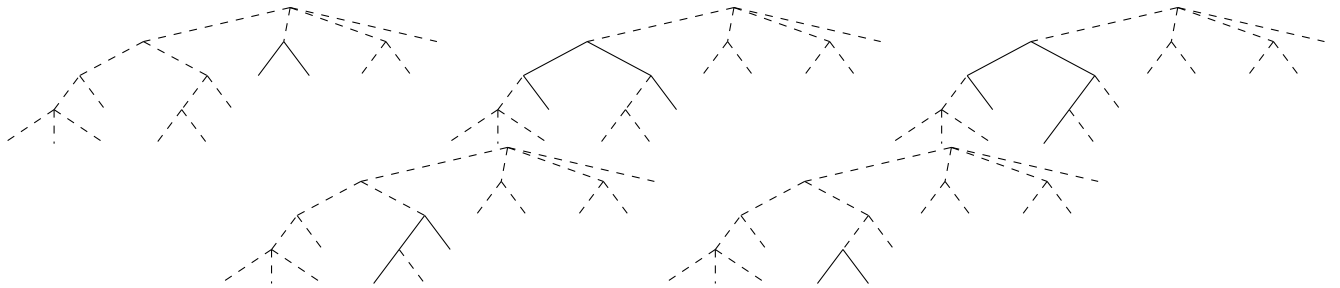




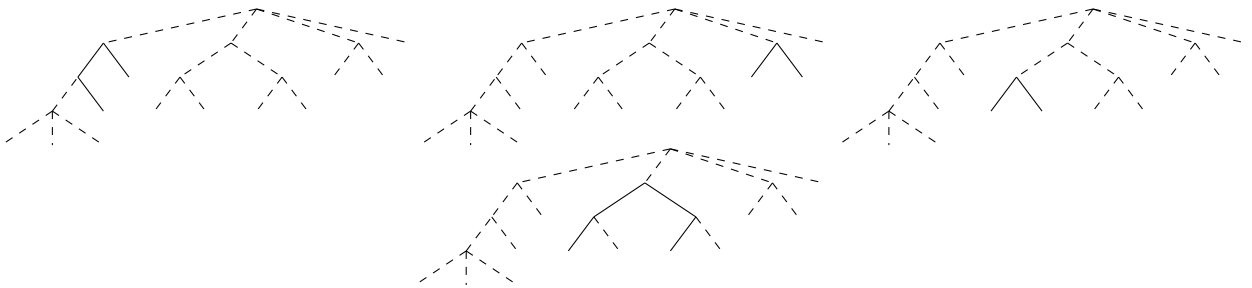
**Topology 285**



**Topology 286**



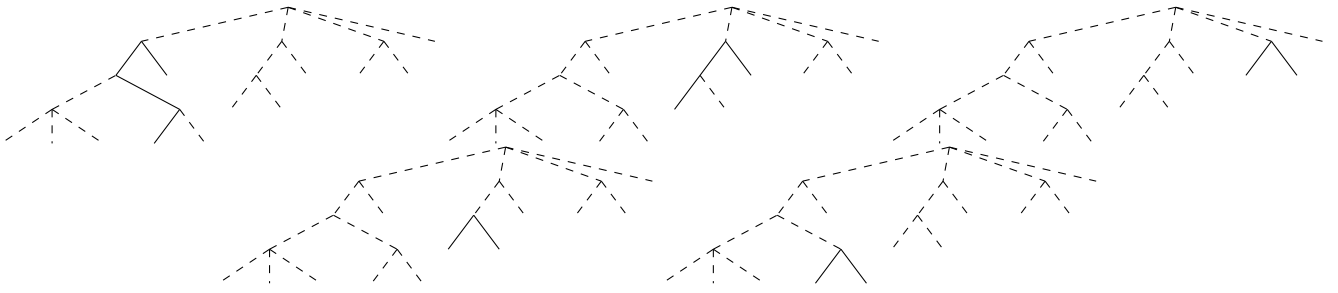
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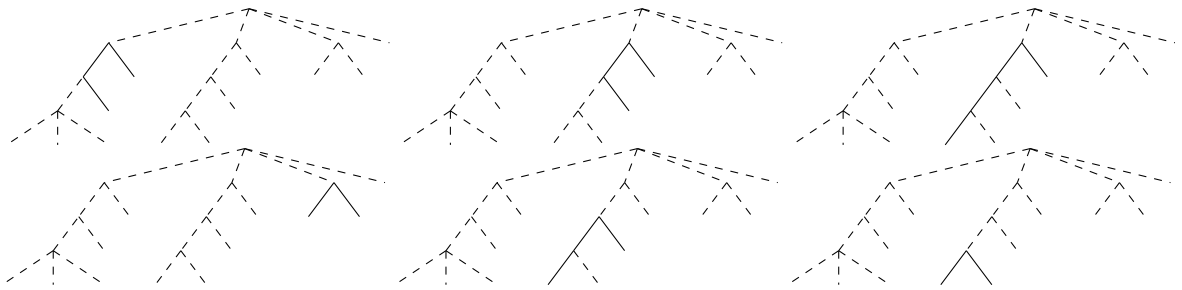
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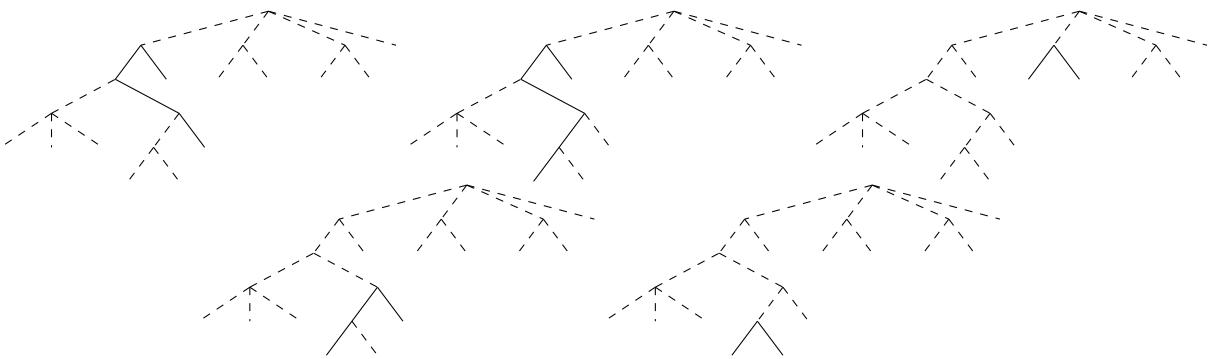
**Topology 289**



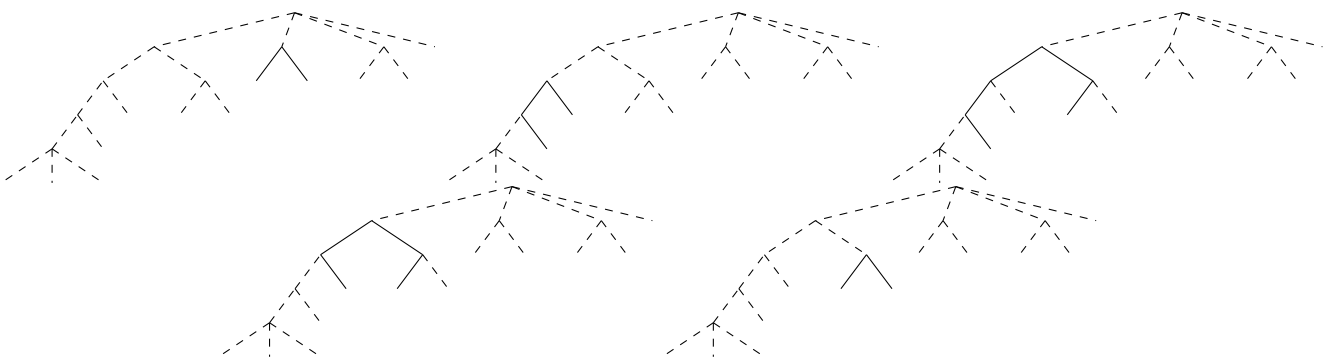
**Topology 290**



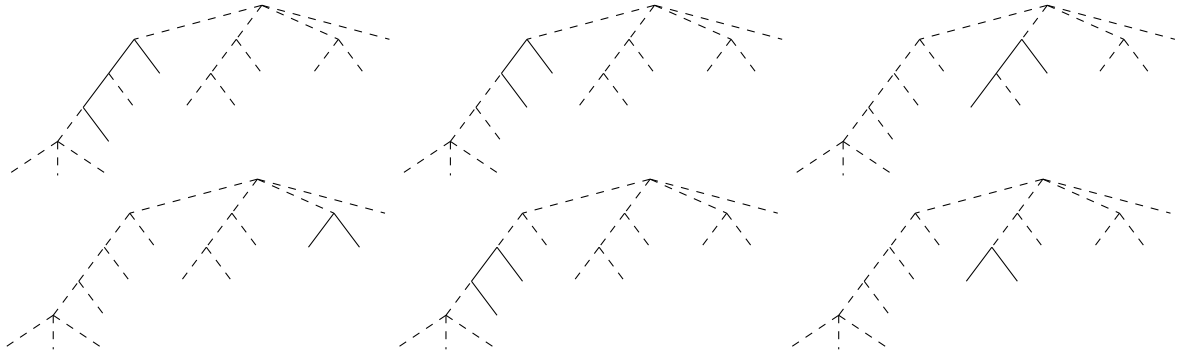
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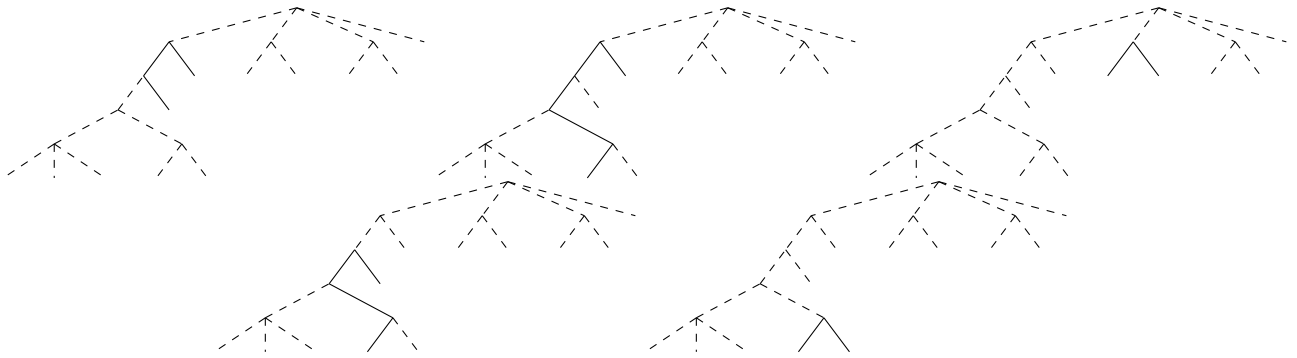
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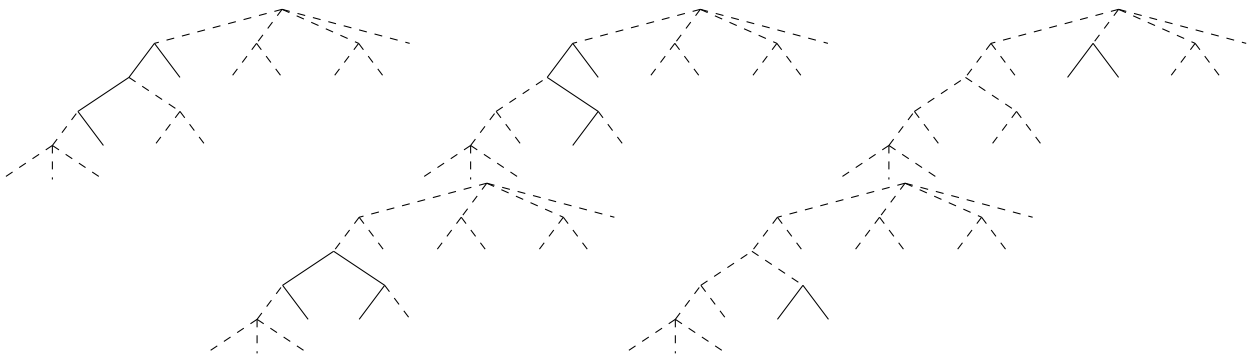
**Topology 293**



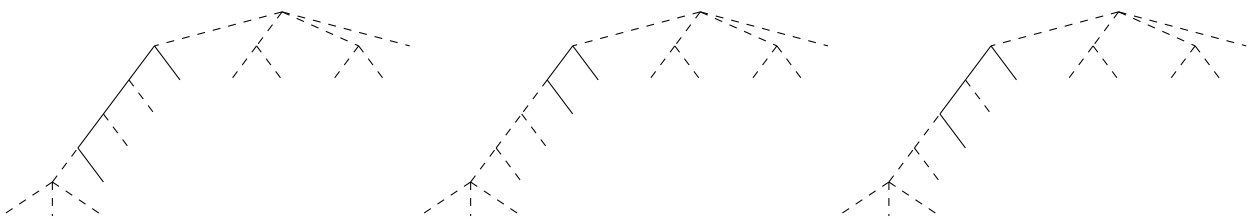
**Topology 294**

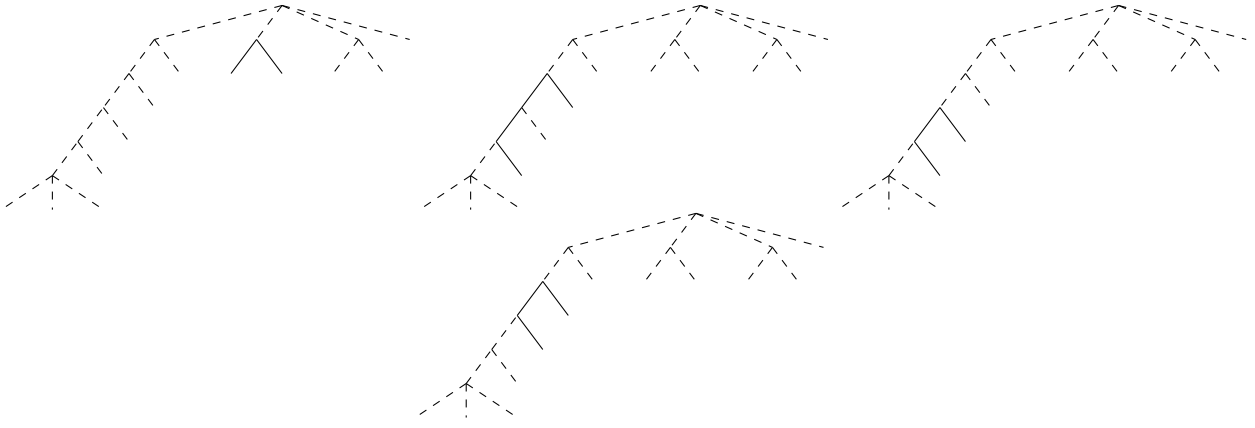


**Topology 295**

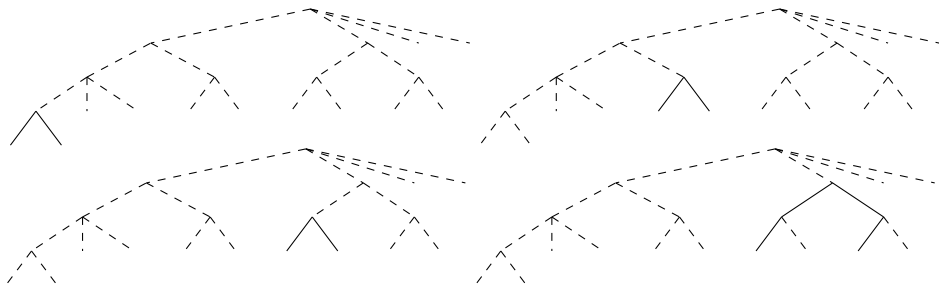


**Topology 296**

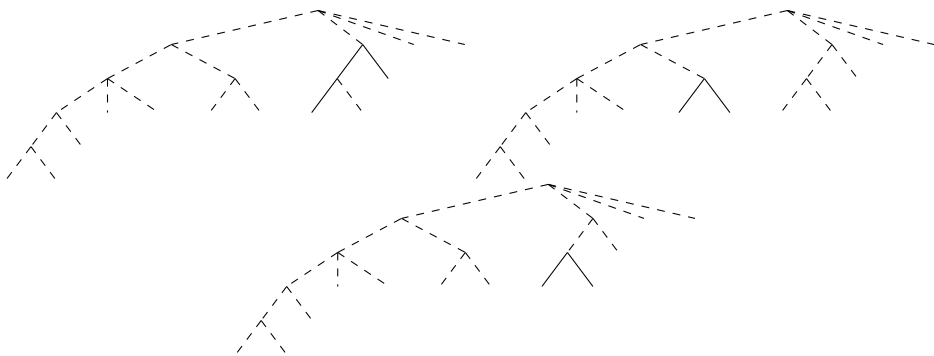




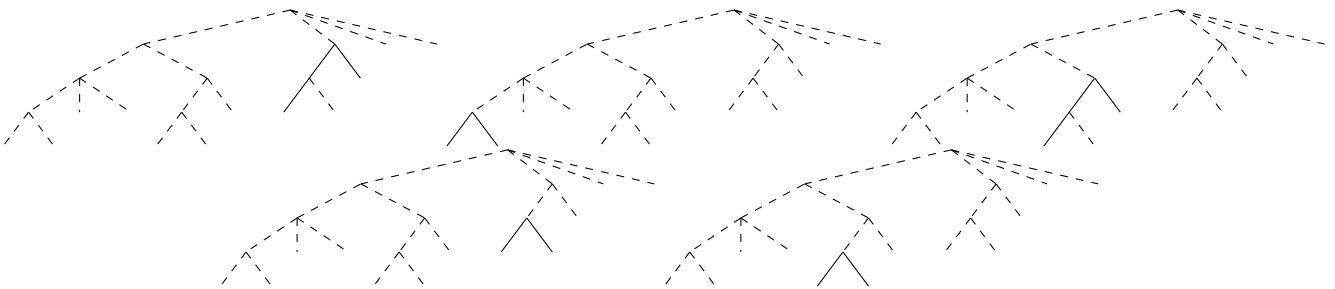
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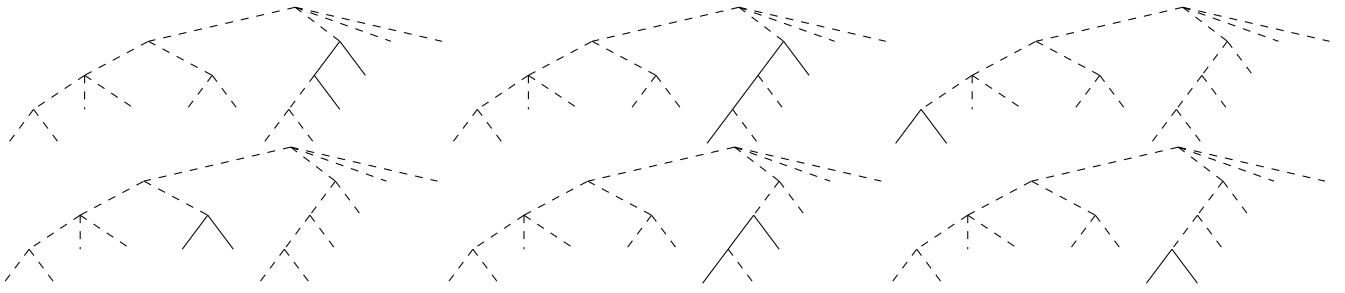
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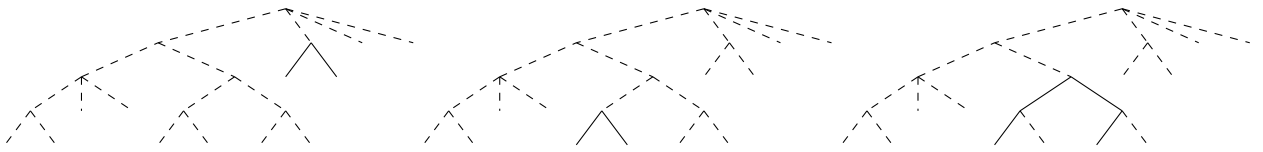
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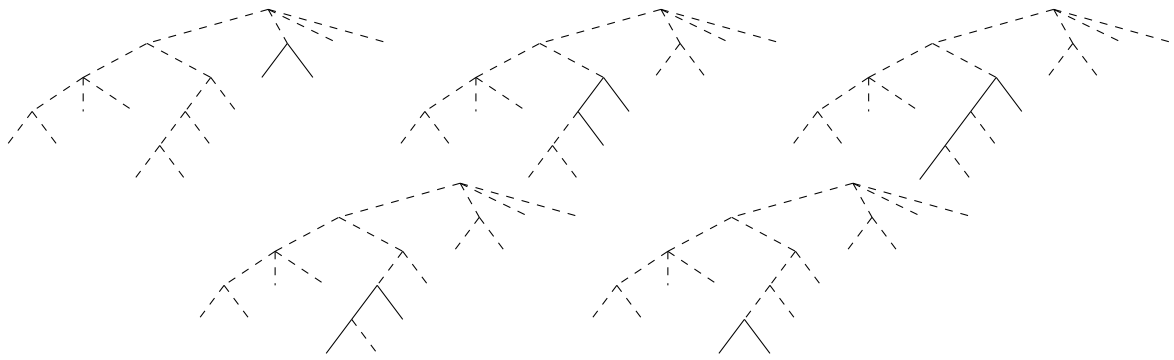
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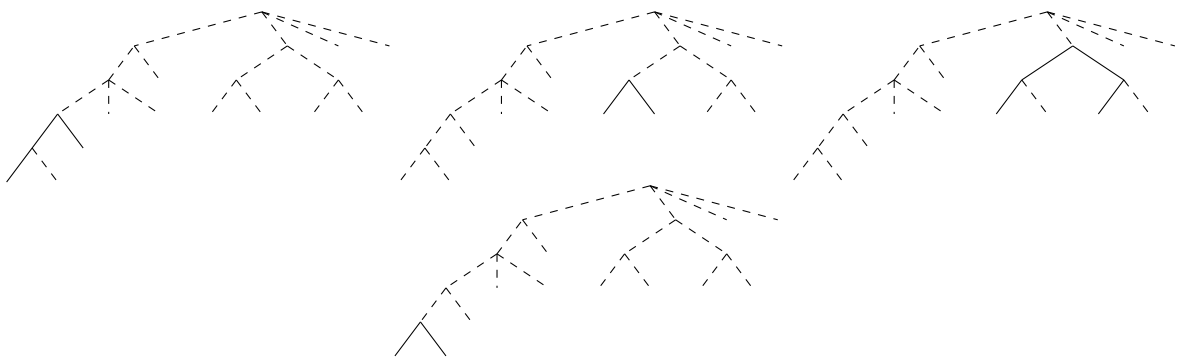
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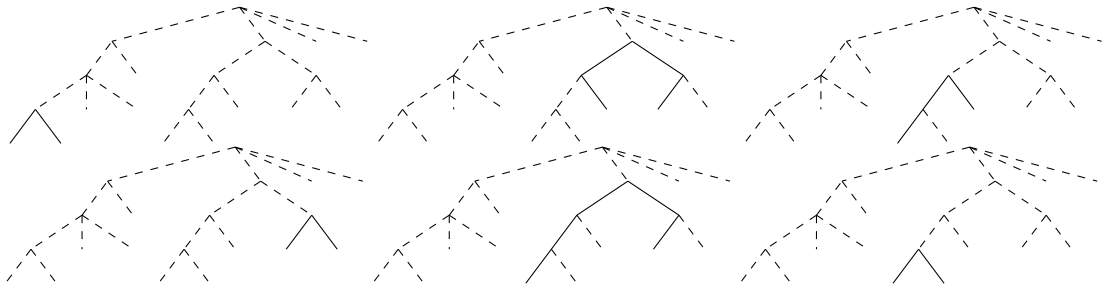
**Topology 302**



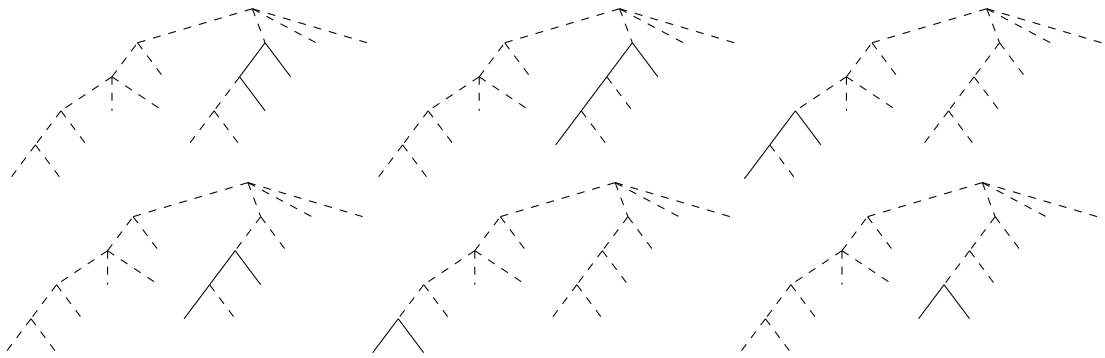
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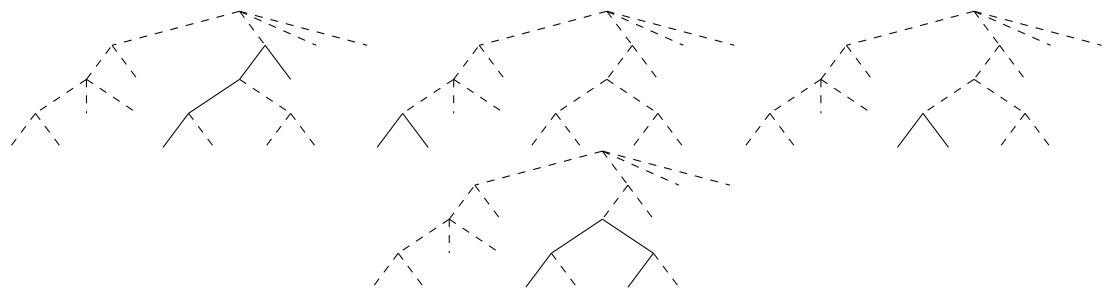
**Topology 304**



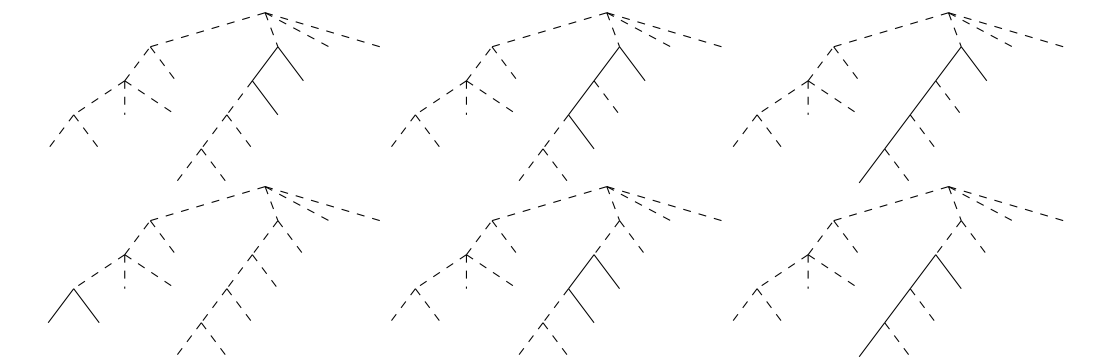
**Topology 305**

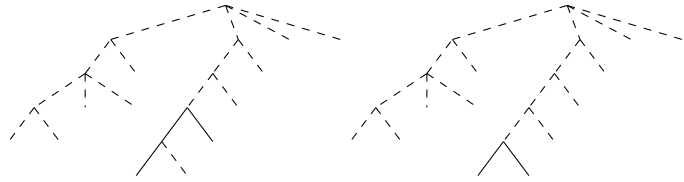


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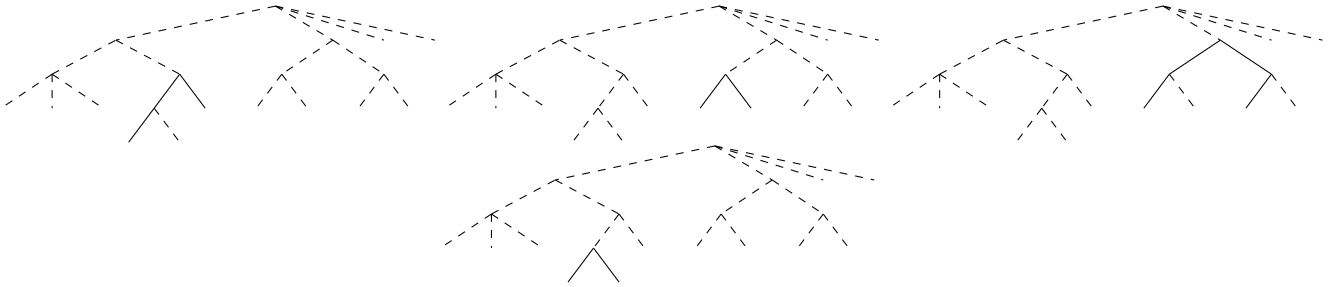


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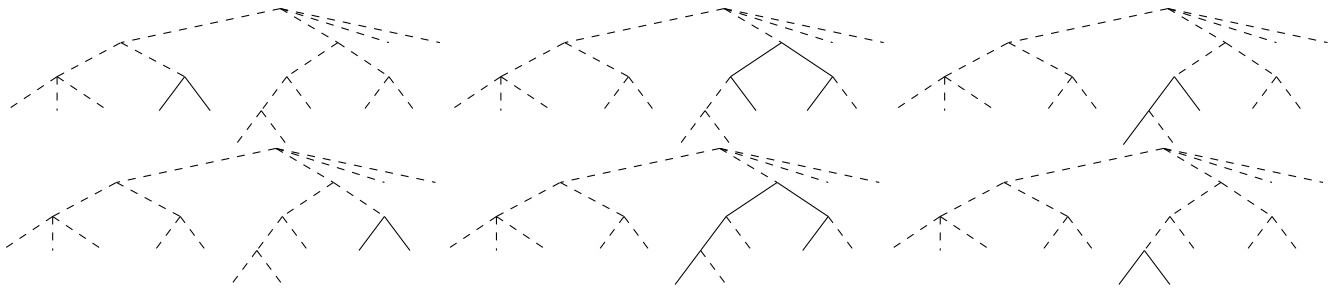




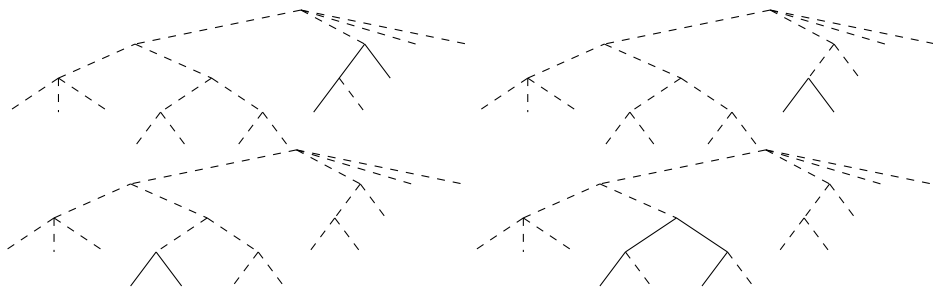
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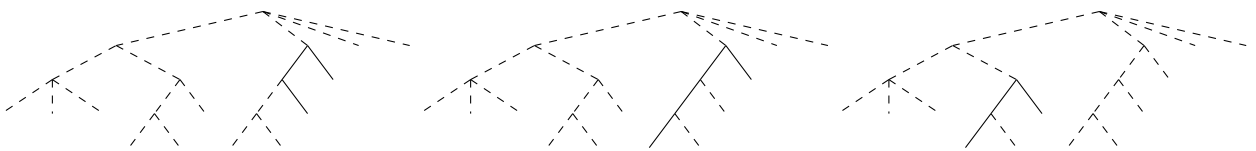
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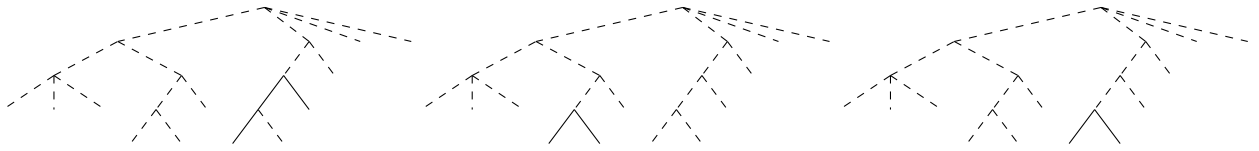


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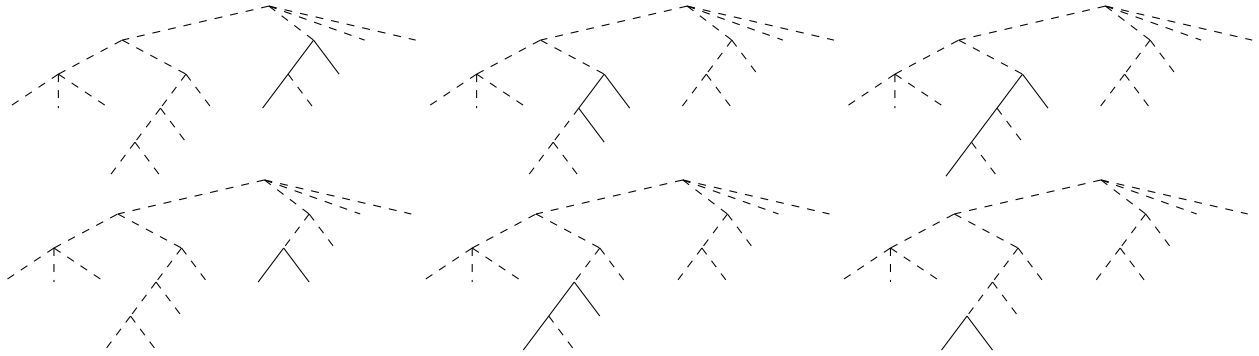


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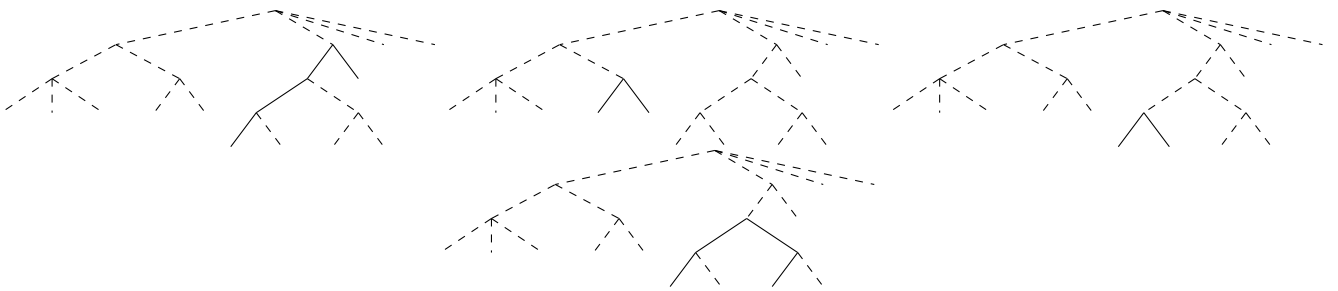




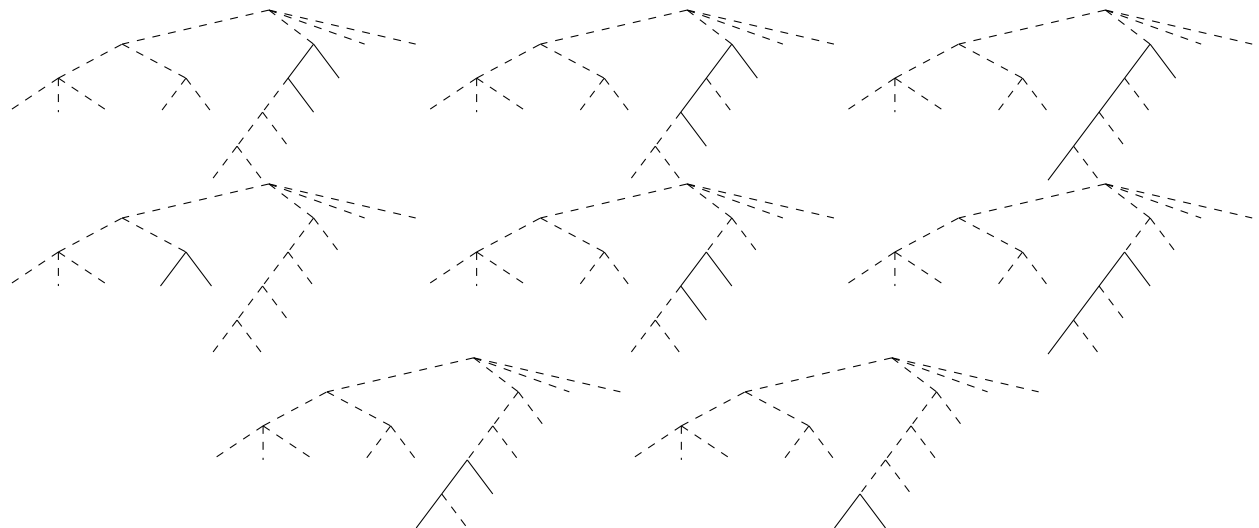
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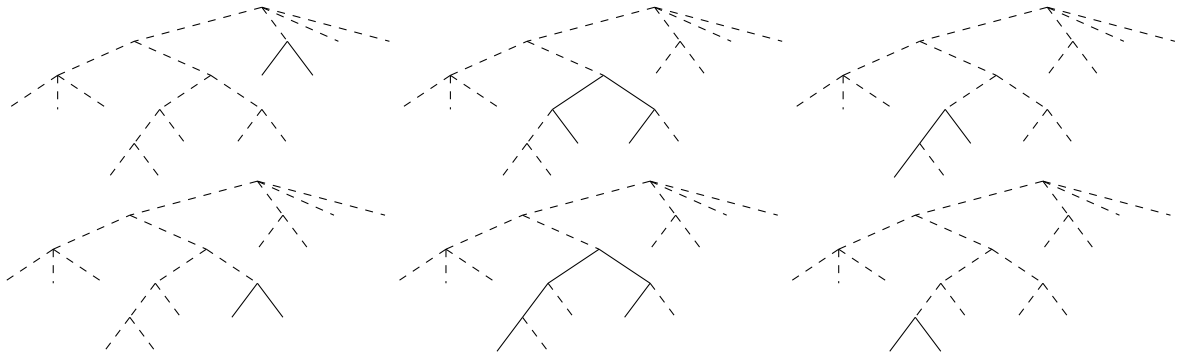
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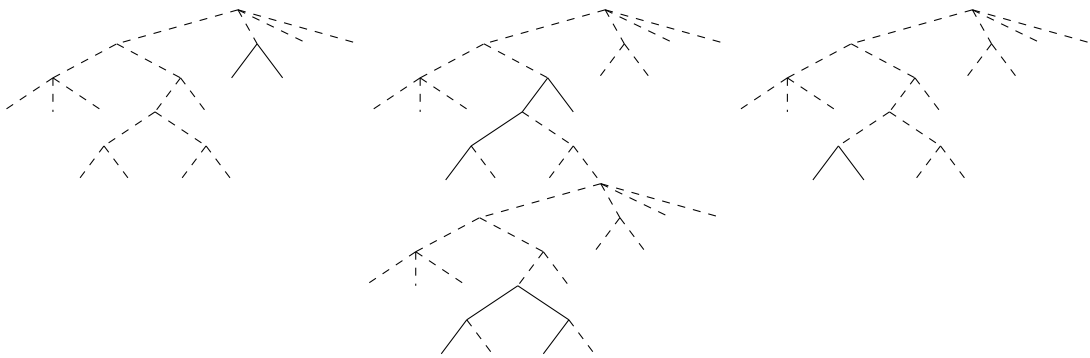
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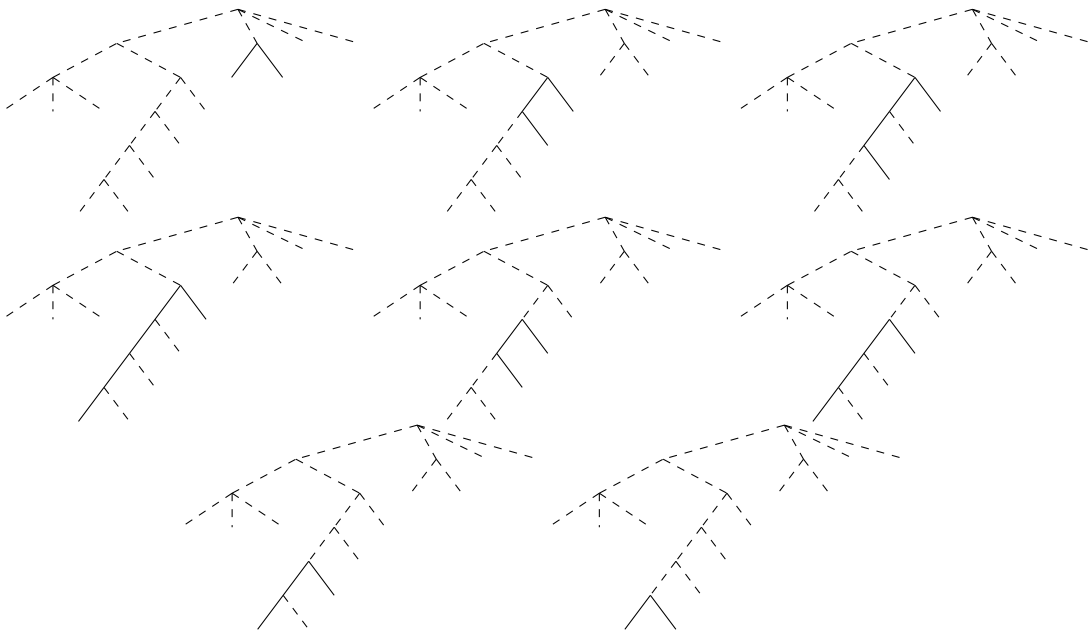
**Topology 315**



**Topology 316**

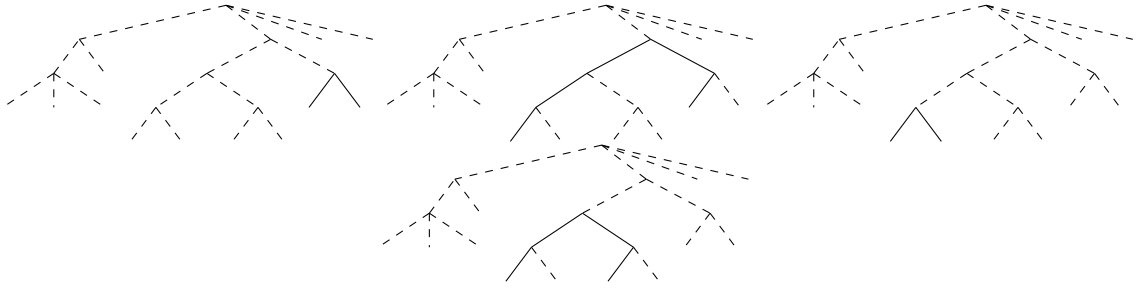


**Topology 317**

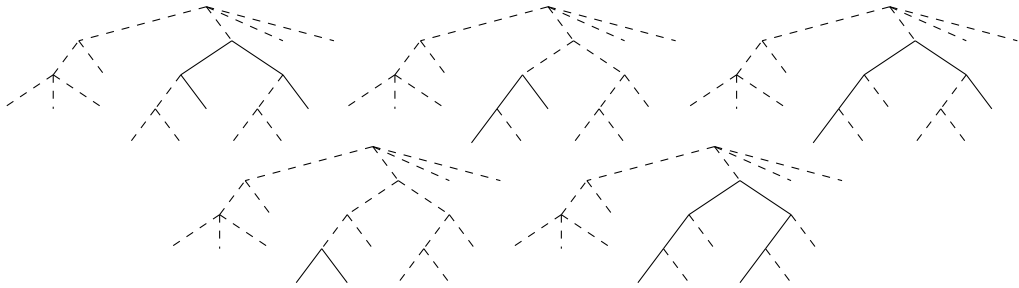




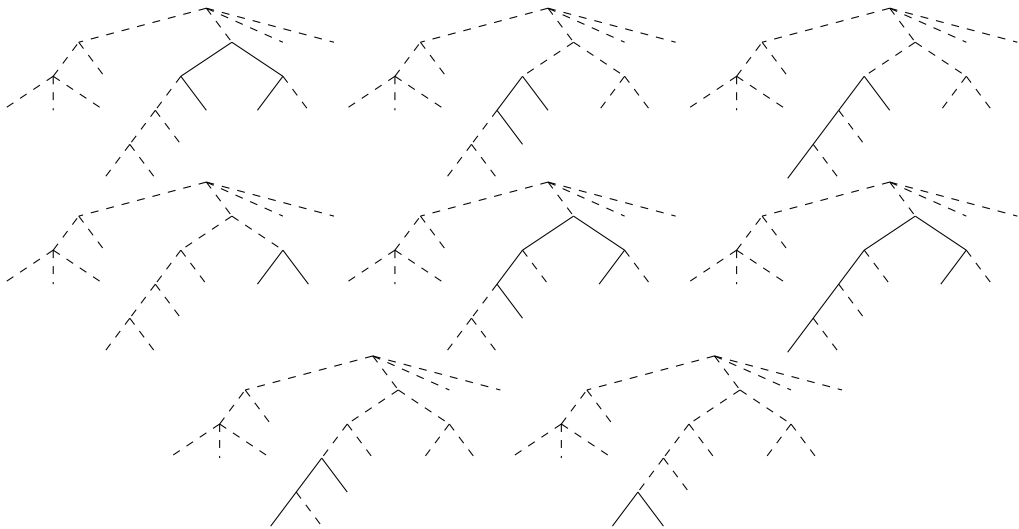
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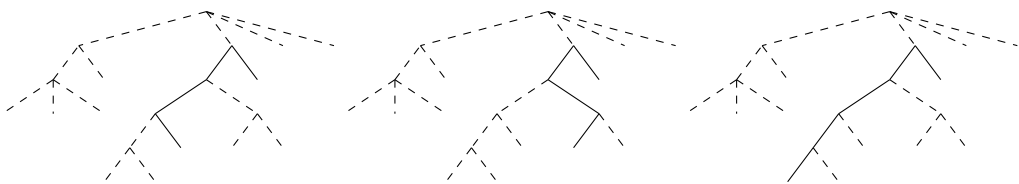
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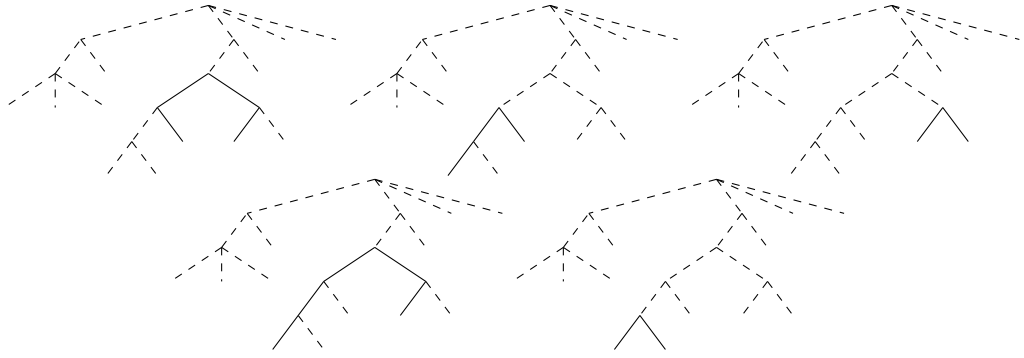


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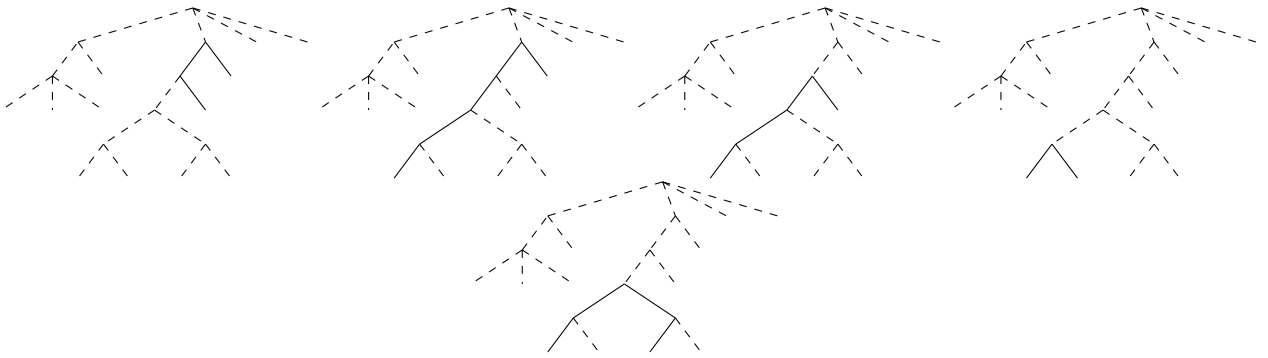


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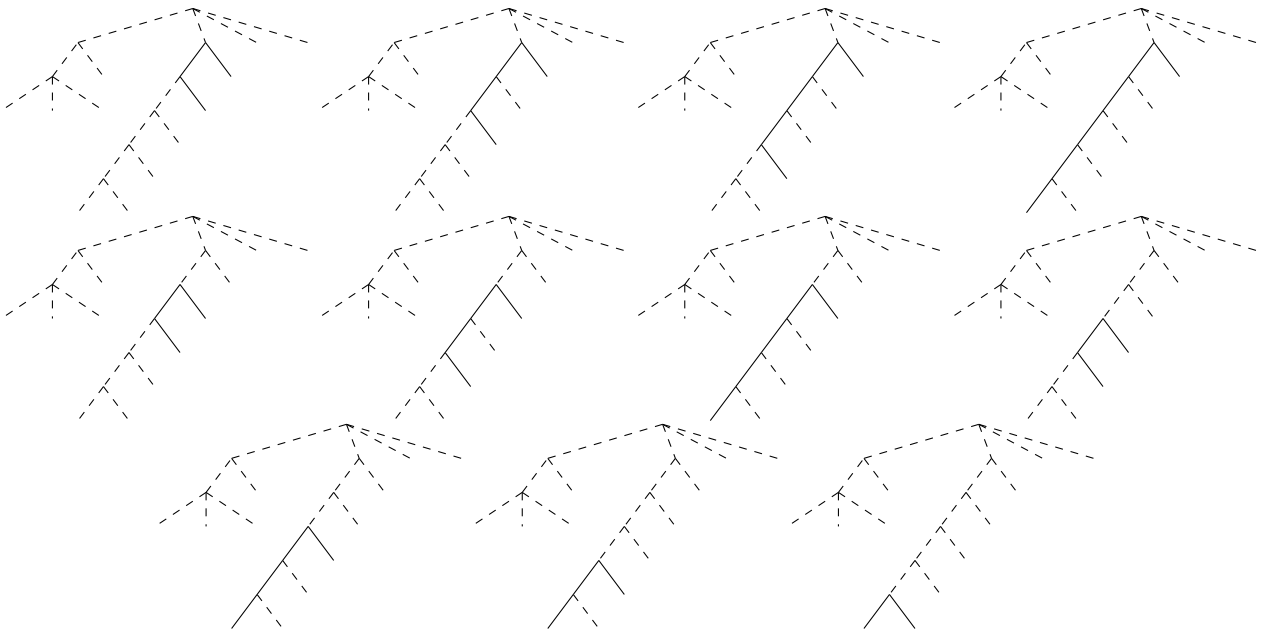




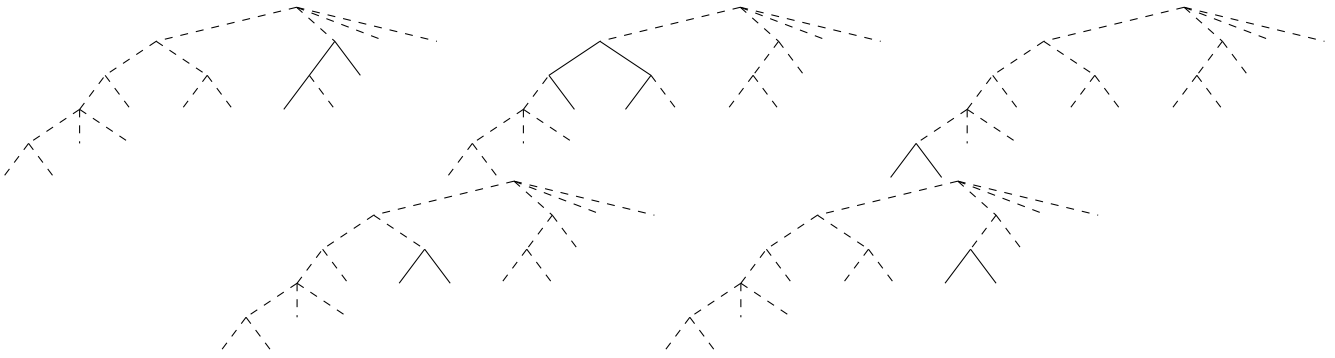
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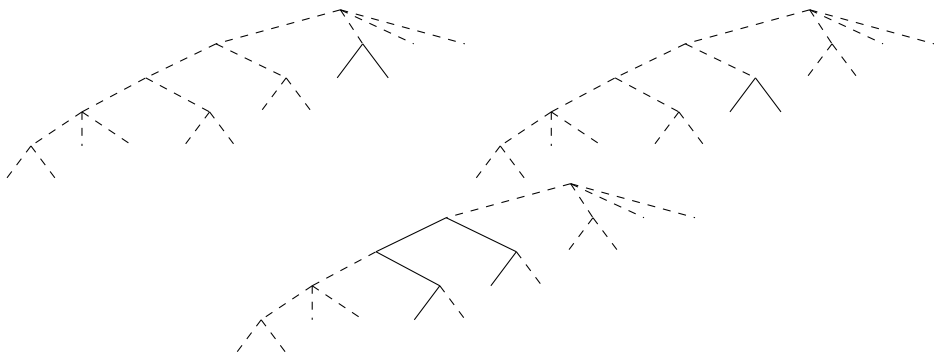
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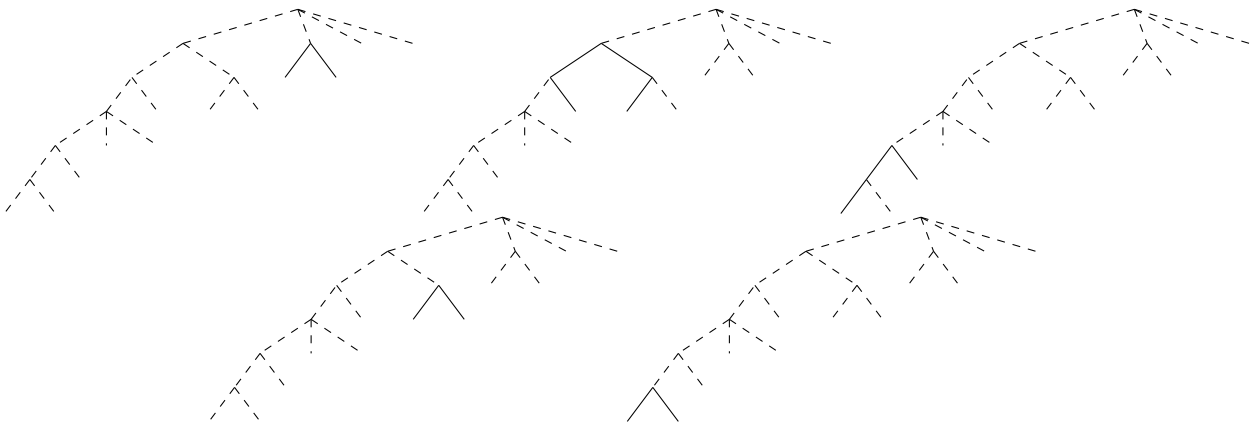
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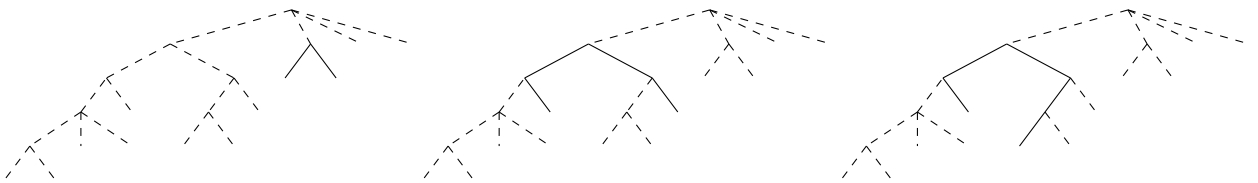
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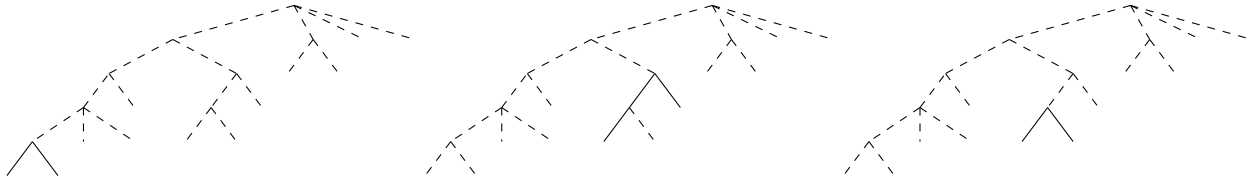


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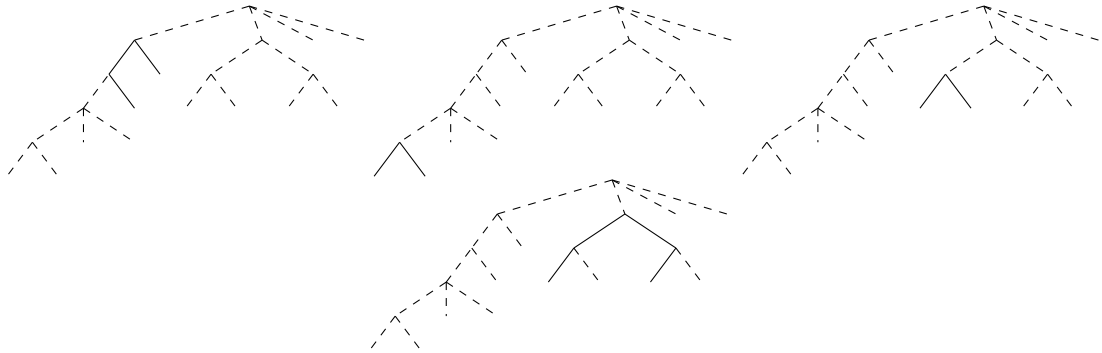


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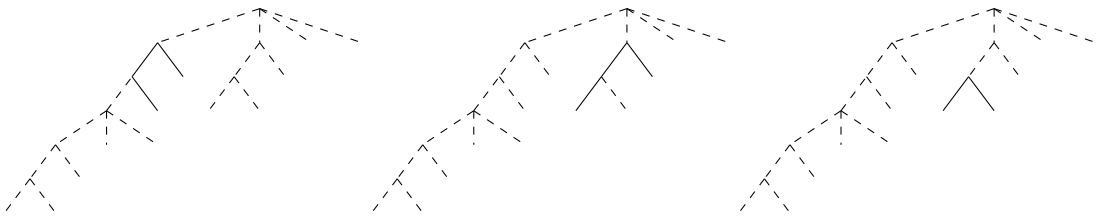




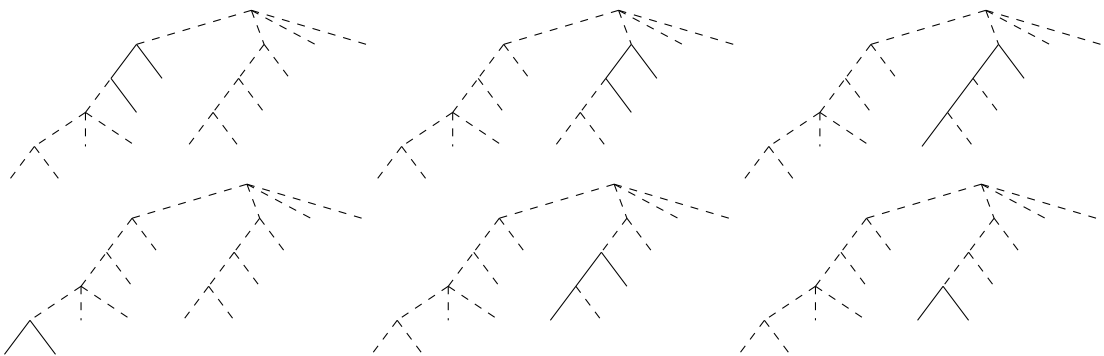
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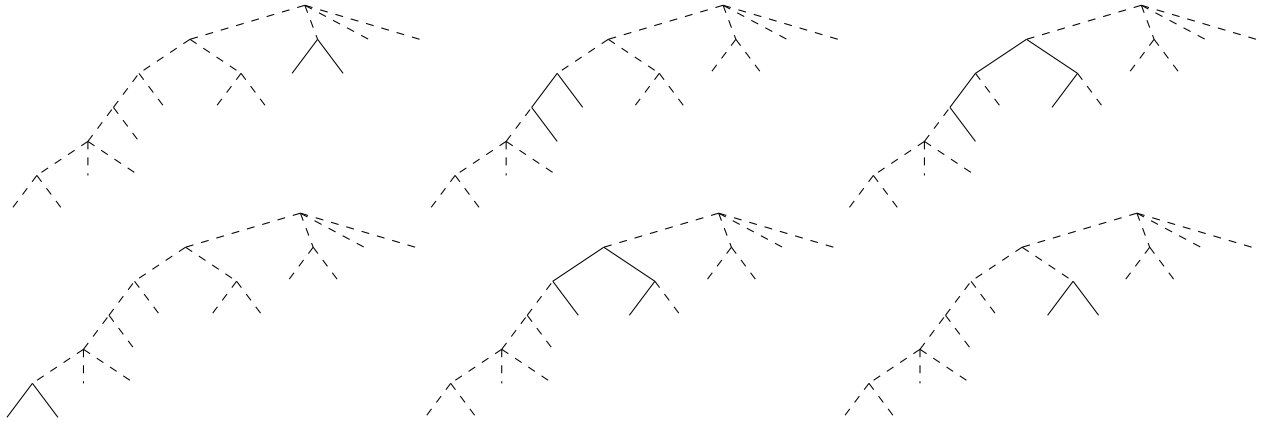
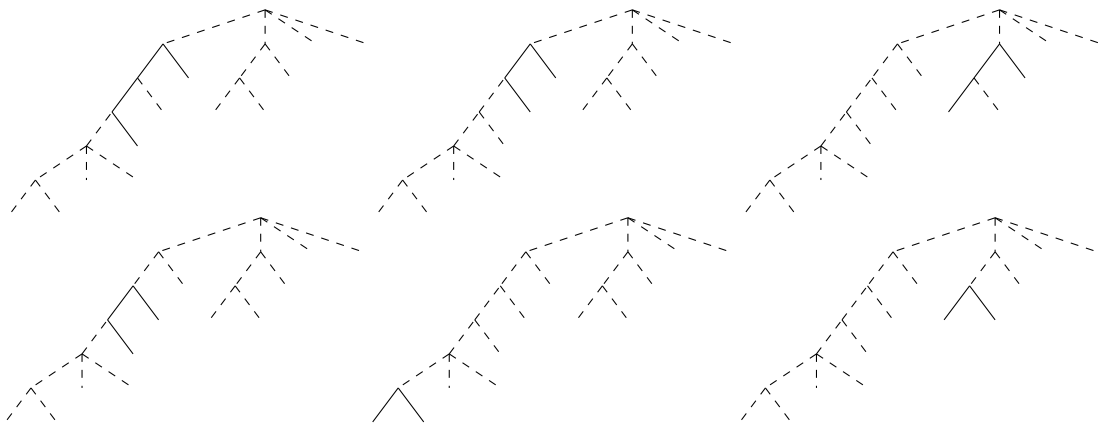
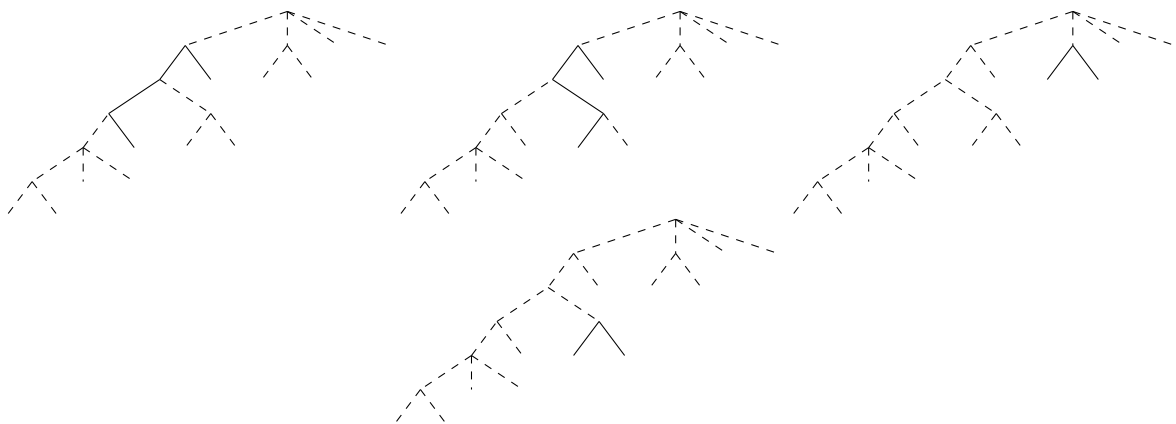


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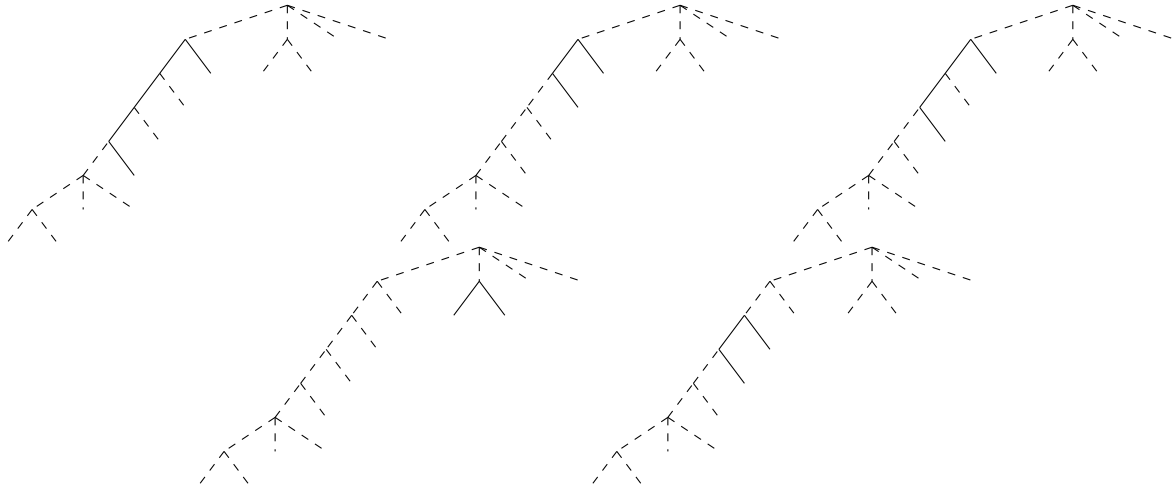


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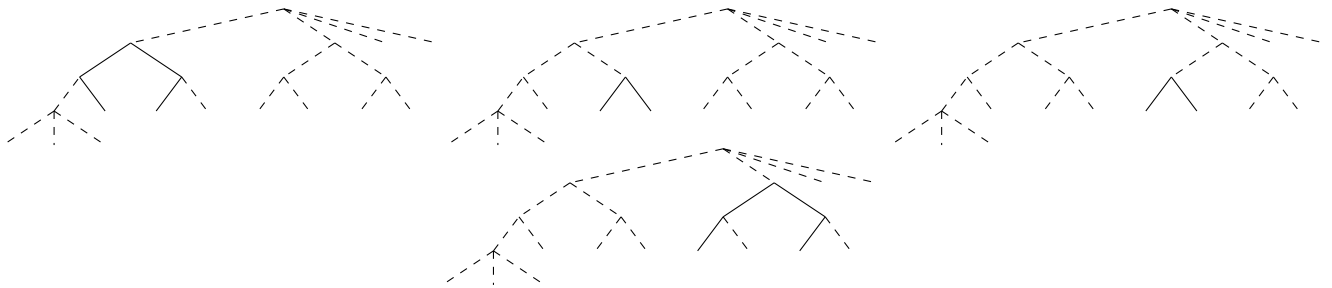


**Topology 331****Topology 332****Topology 333**

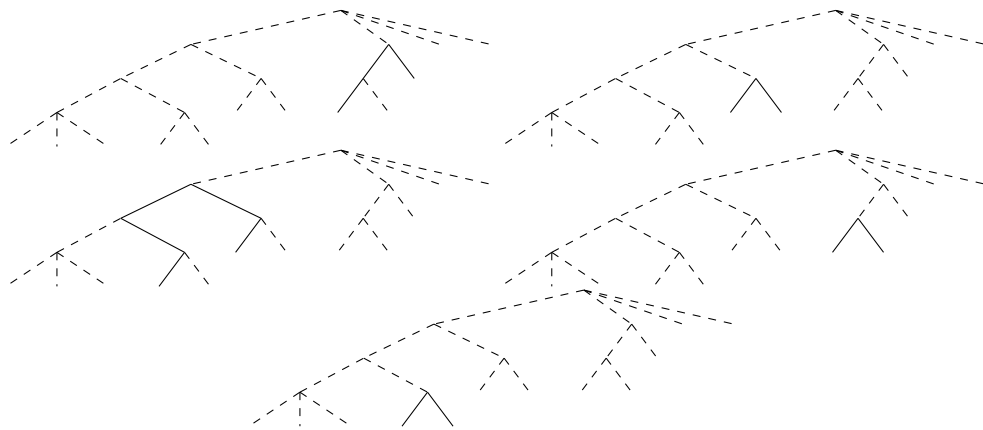
**Topology 334**



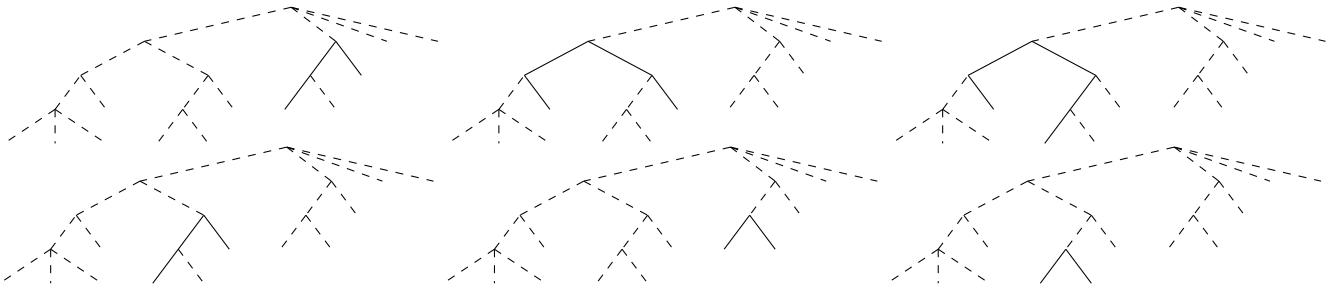
**Topology 335**



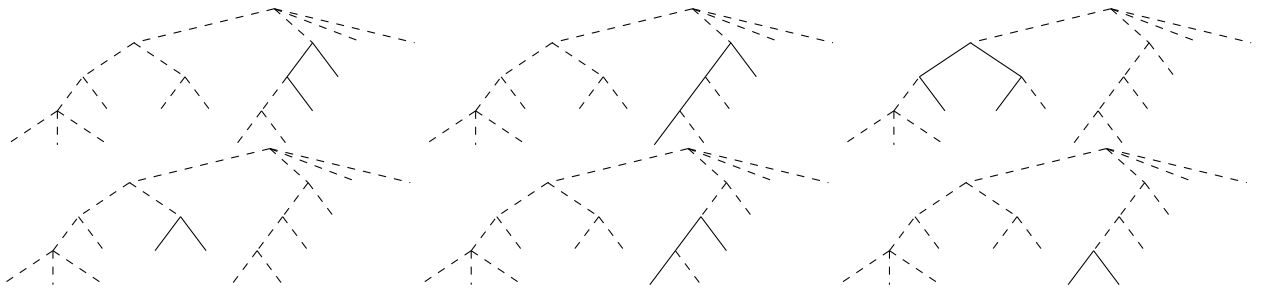
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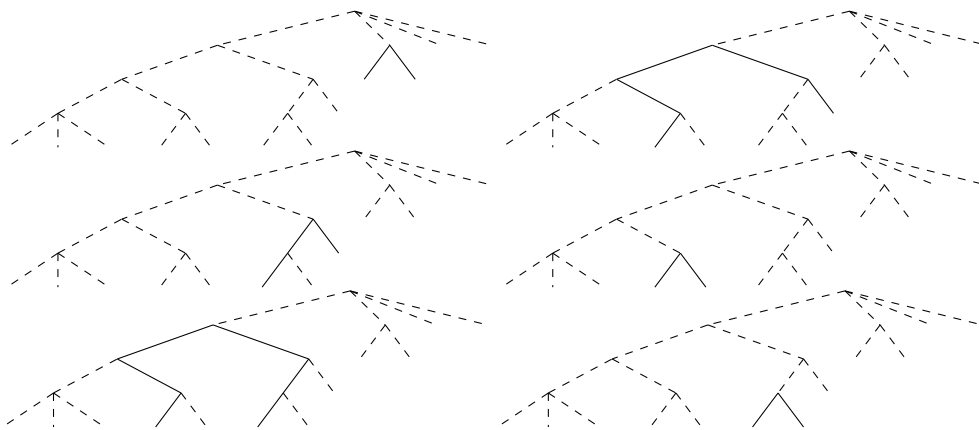
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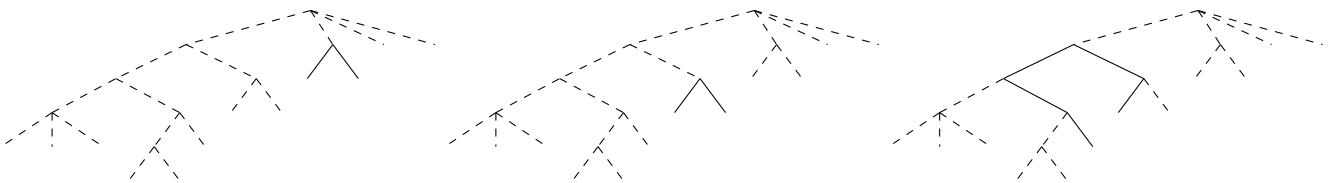
**Topology 338**

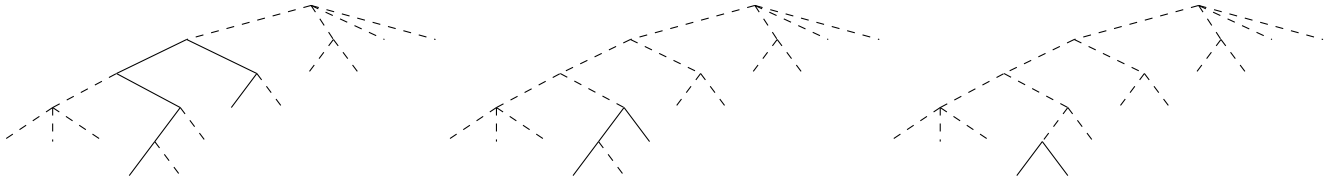


**Topology 339**

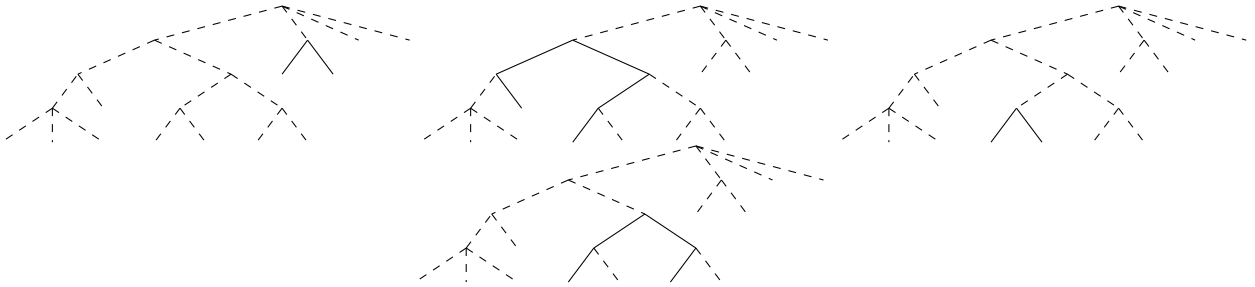


**Topology 340**

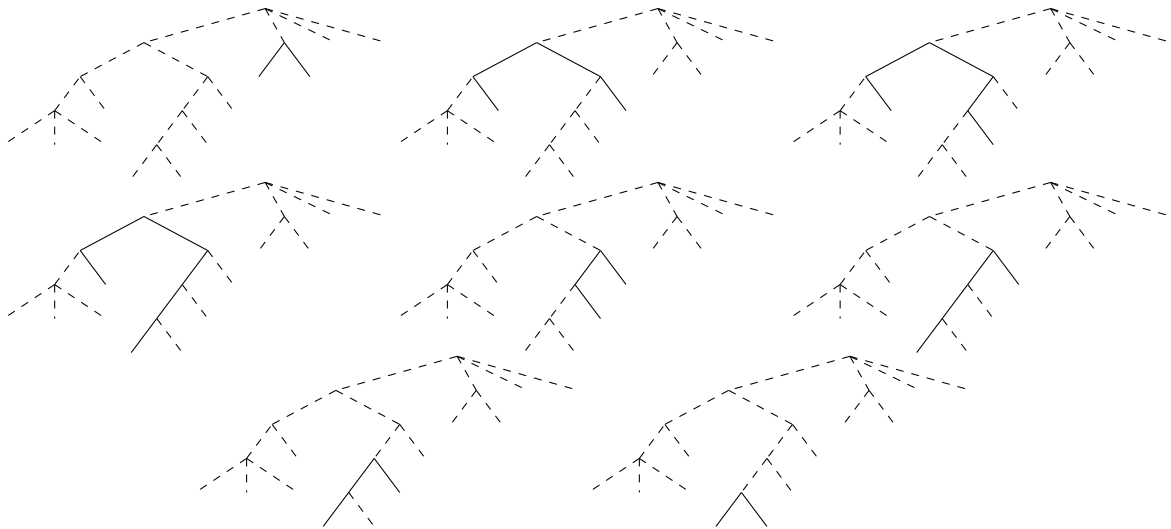




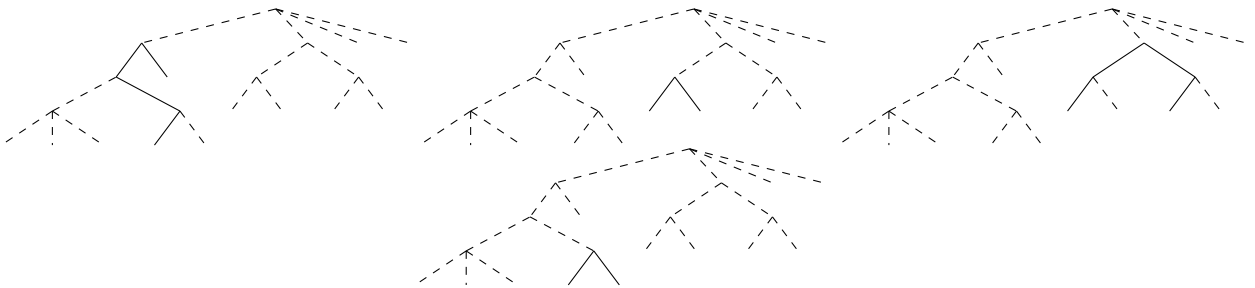
**Topology 341**



**Topology 342**

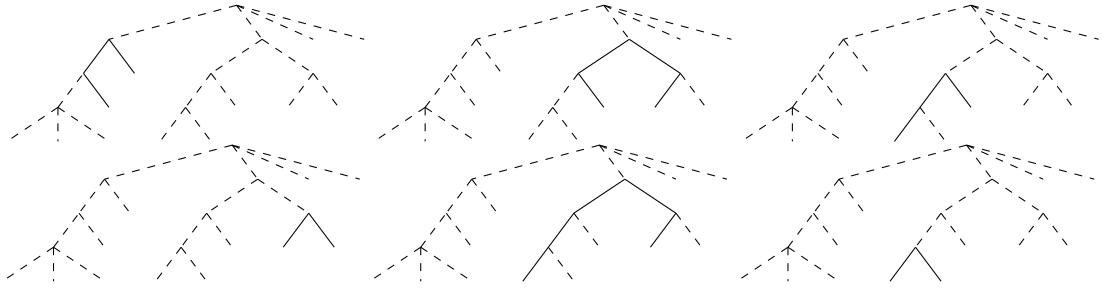


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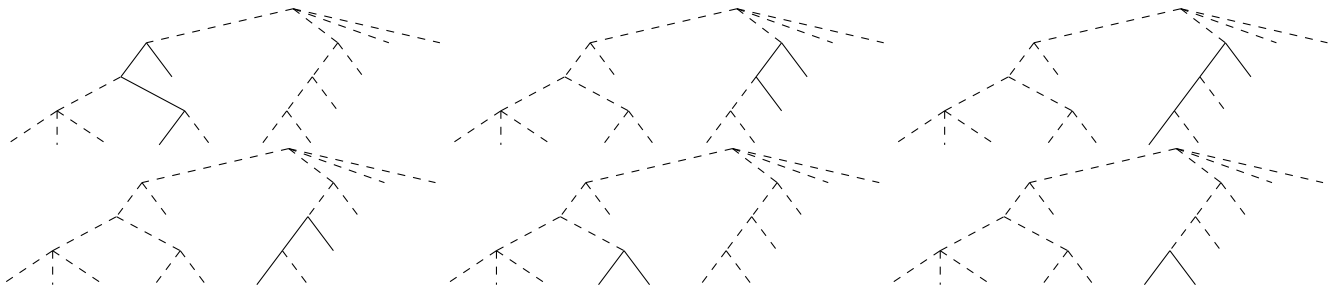




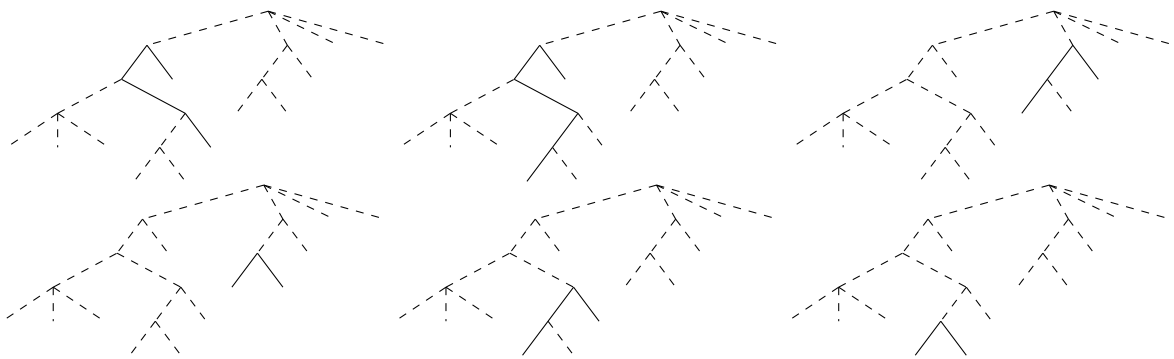
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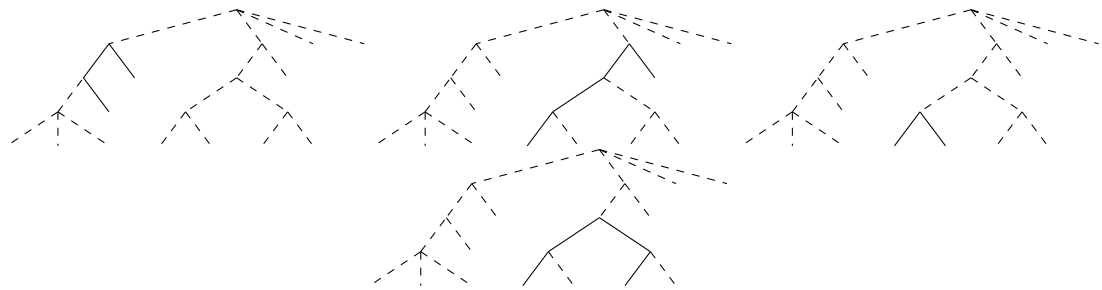
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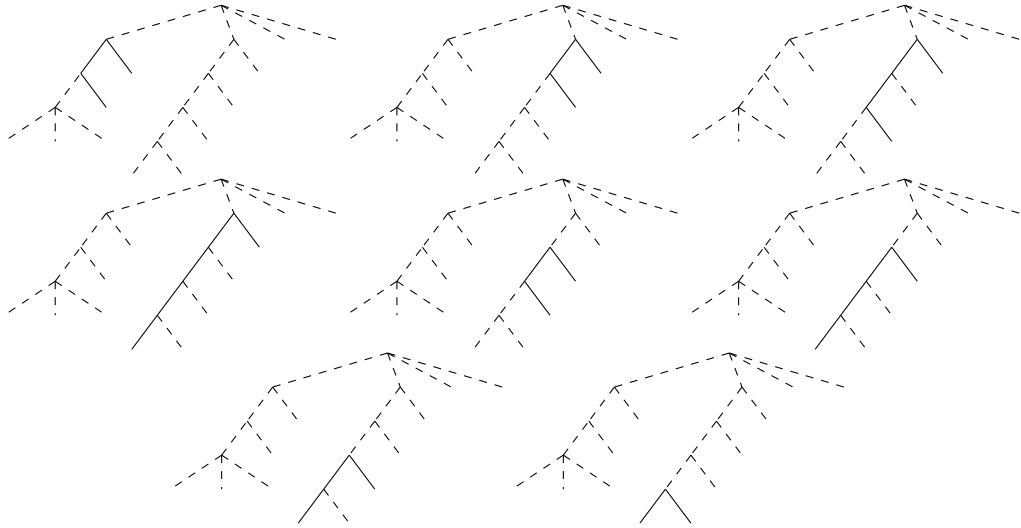
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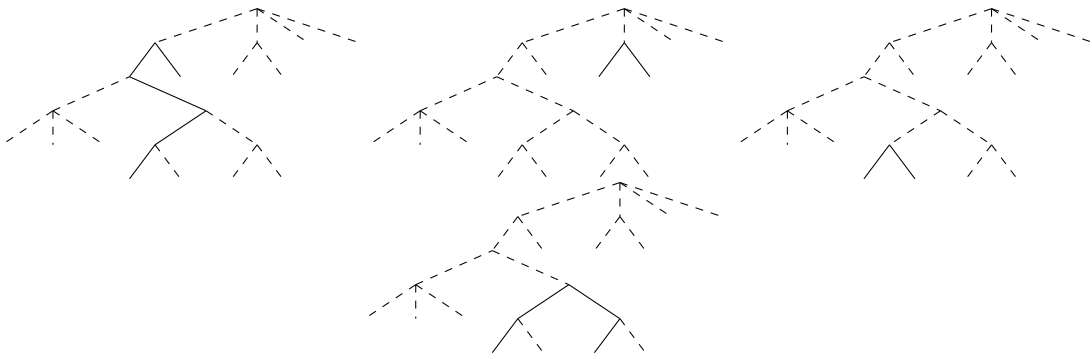
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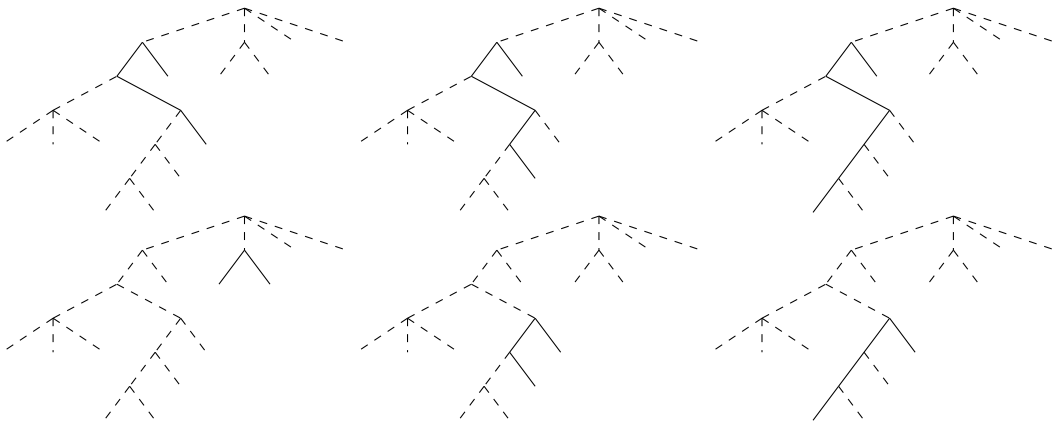
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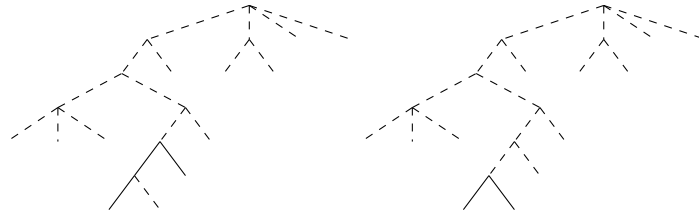


**Topology 349**

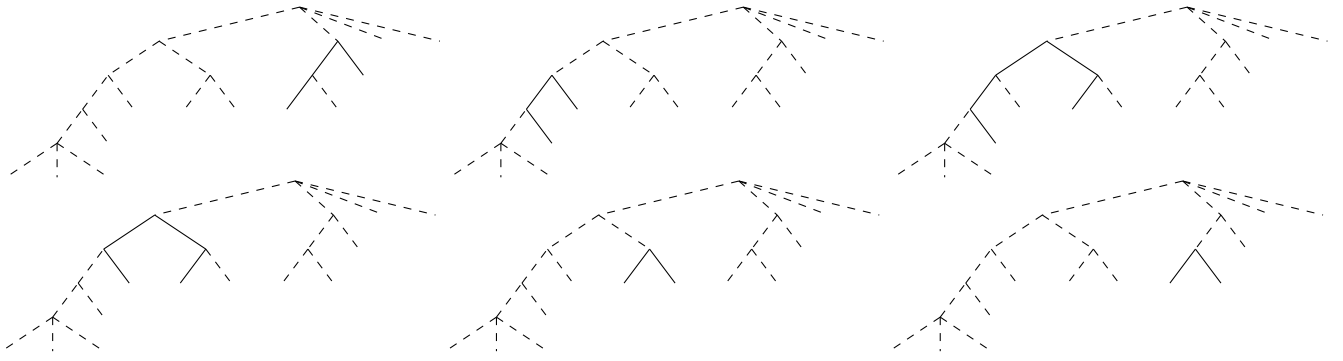


**Topology 350**

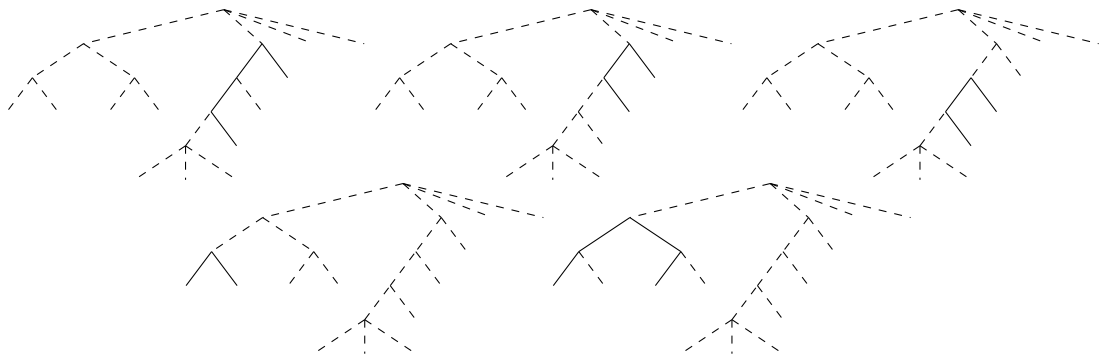




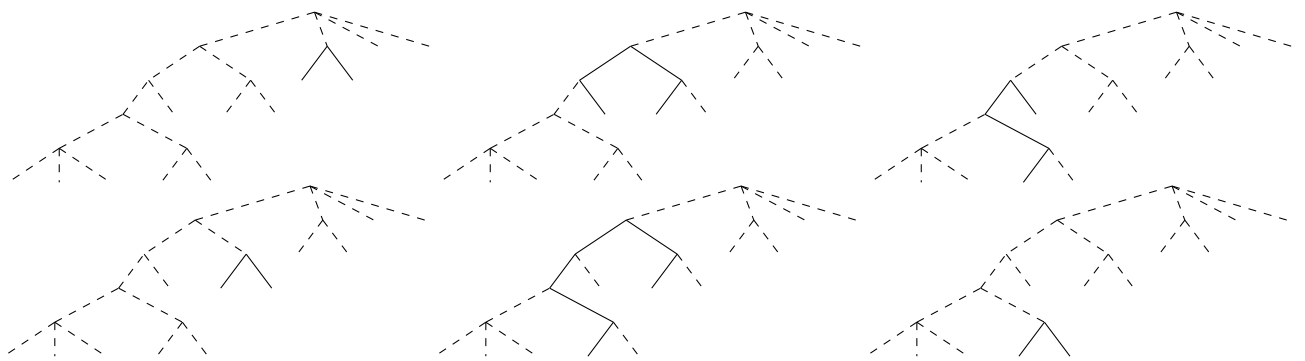
**Topology 351**

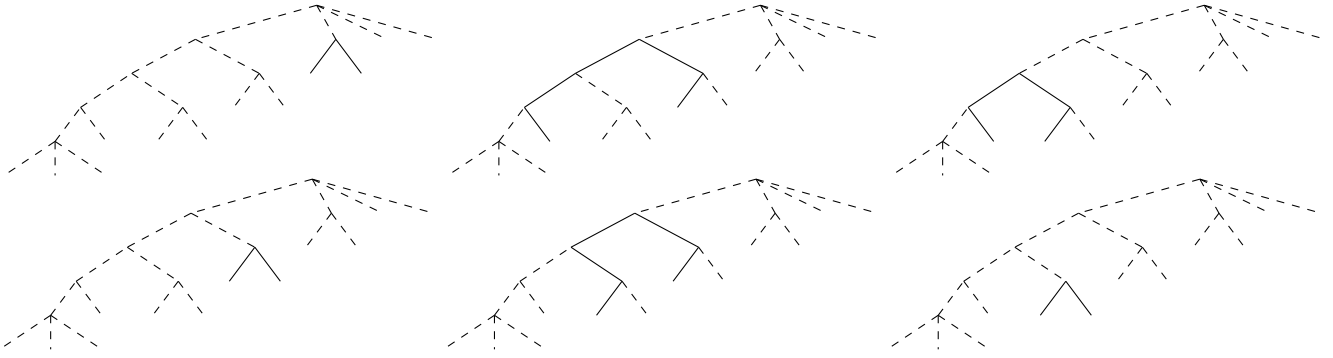
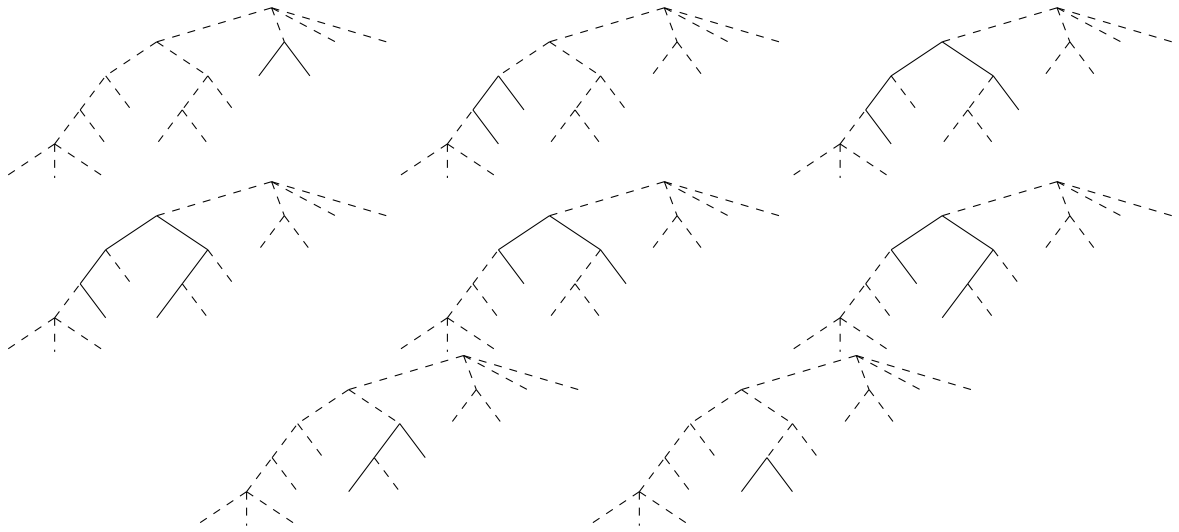
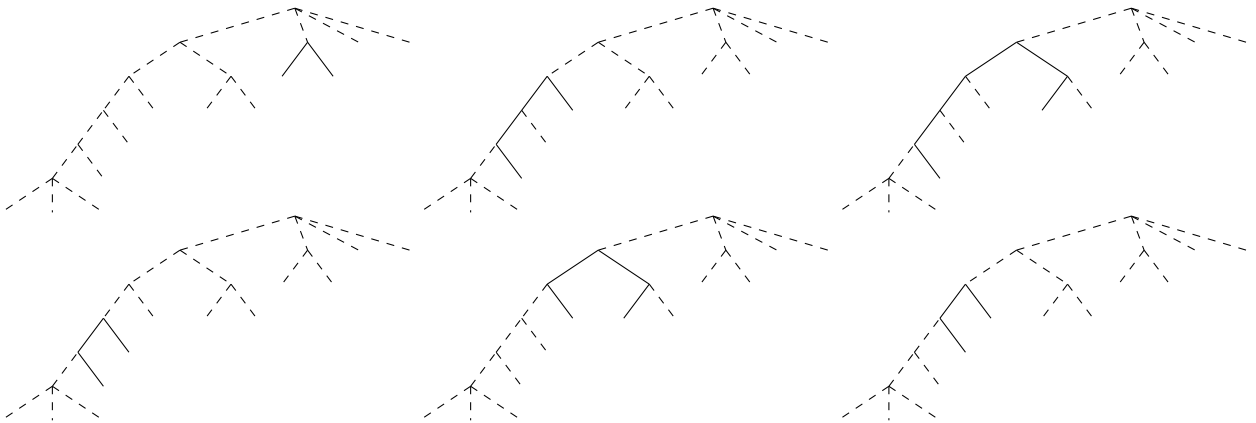


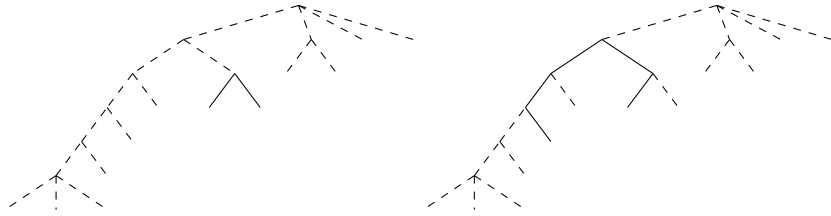
**Topology 352**



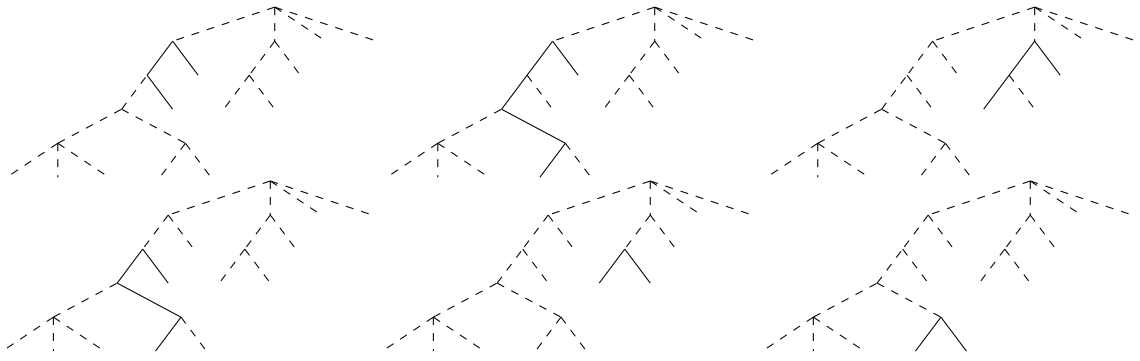
**Topology 353**



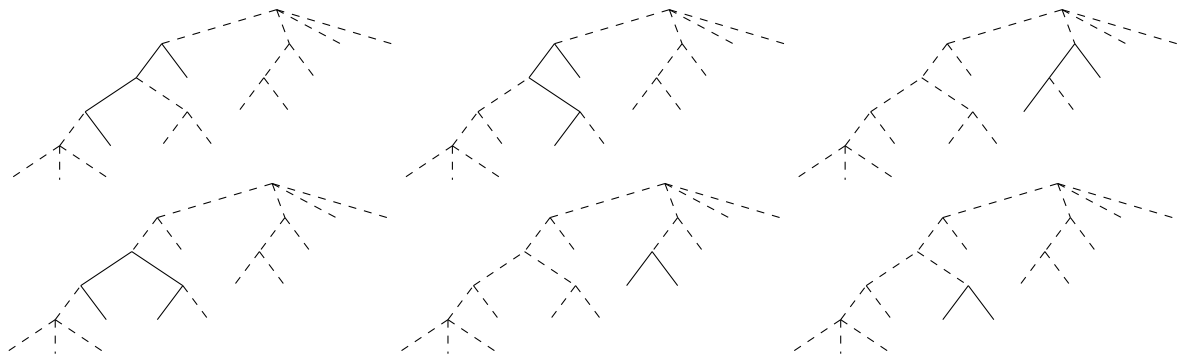
**Topology 354****Topology 355****Topology 356**



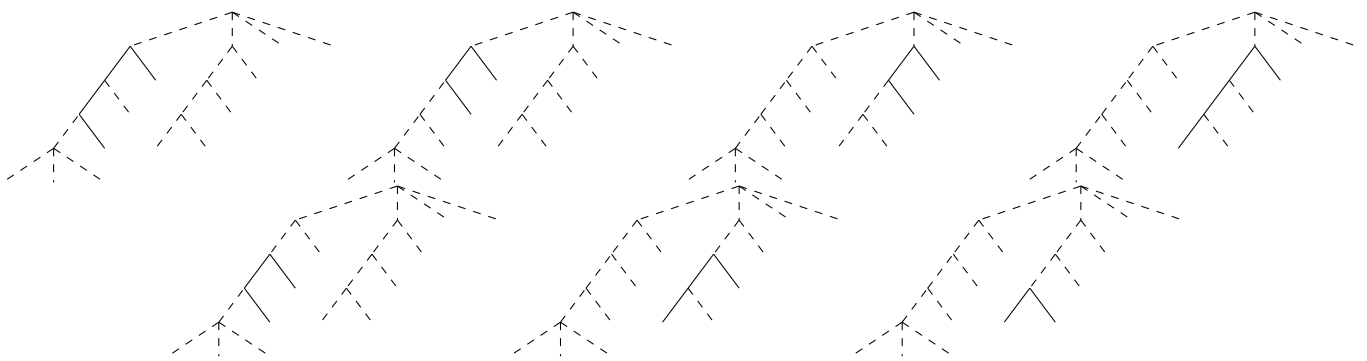
**Topology 357**



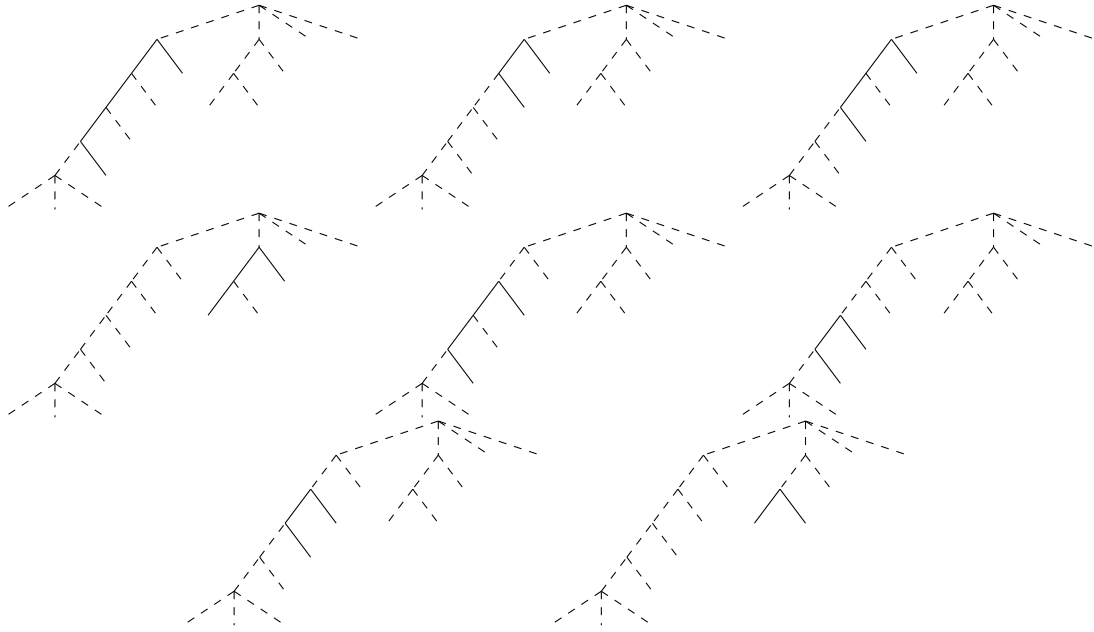
**Topology 358**



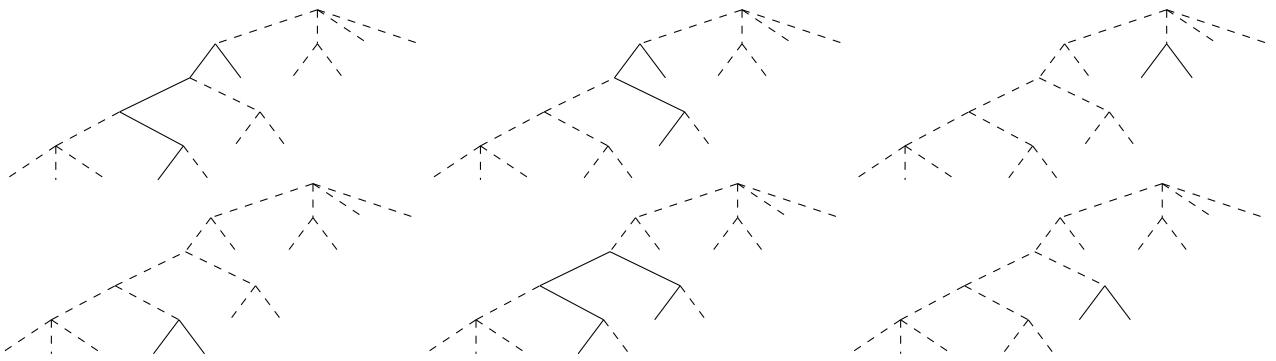
**Topology 359**



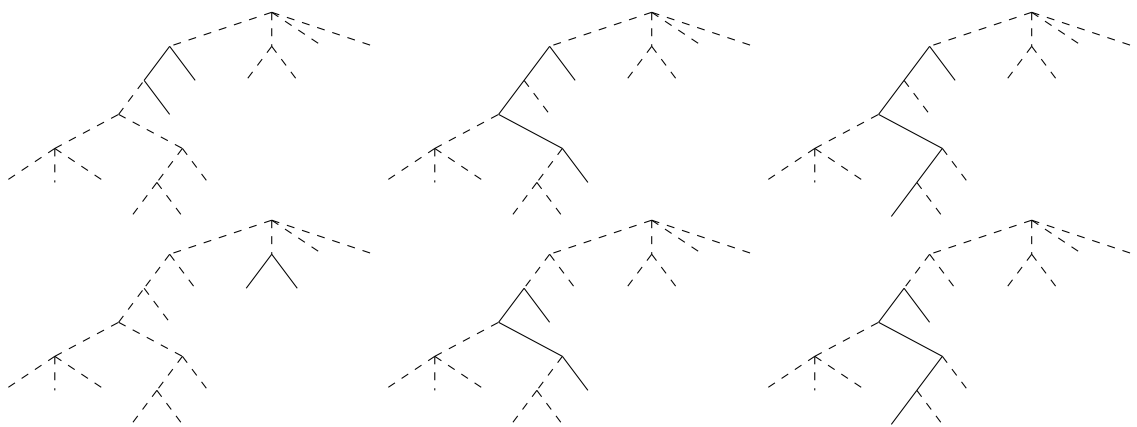
**Topology 360**

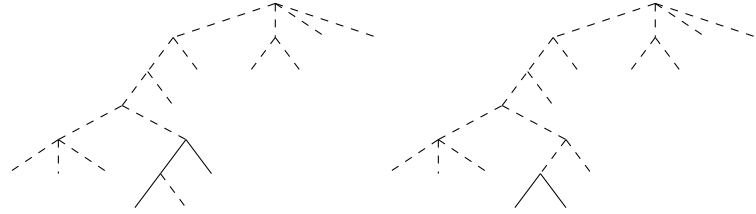


**Topology 361**

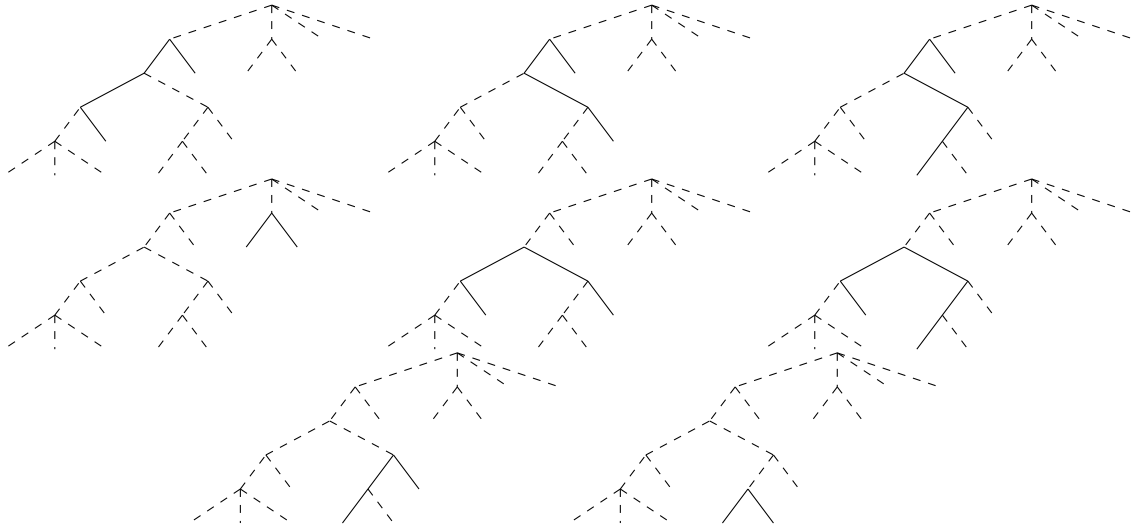


**Topology 362**

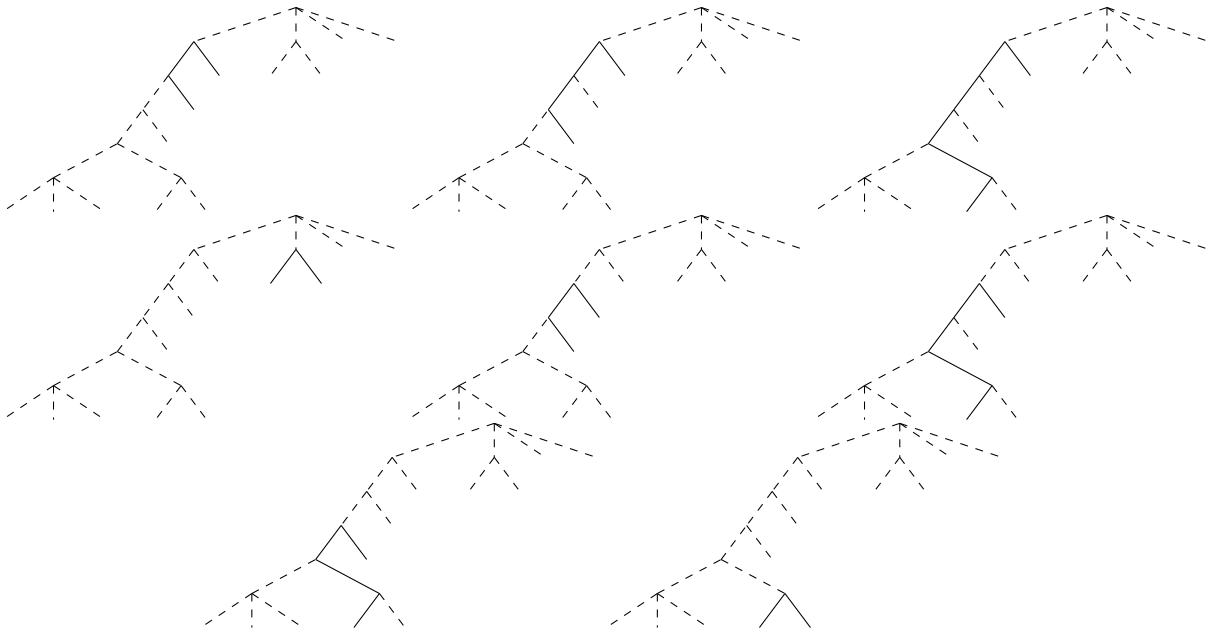


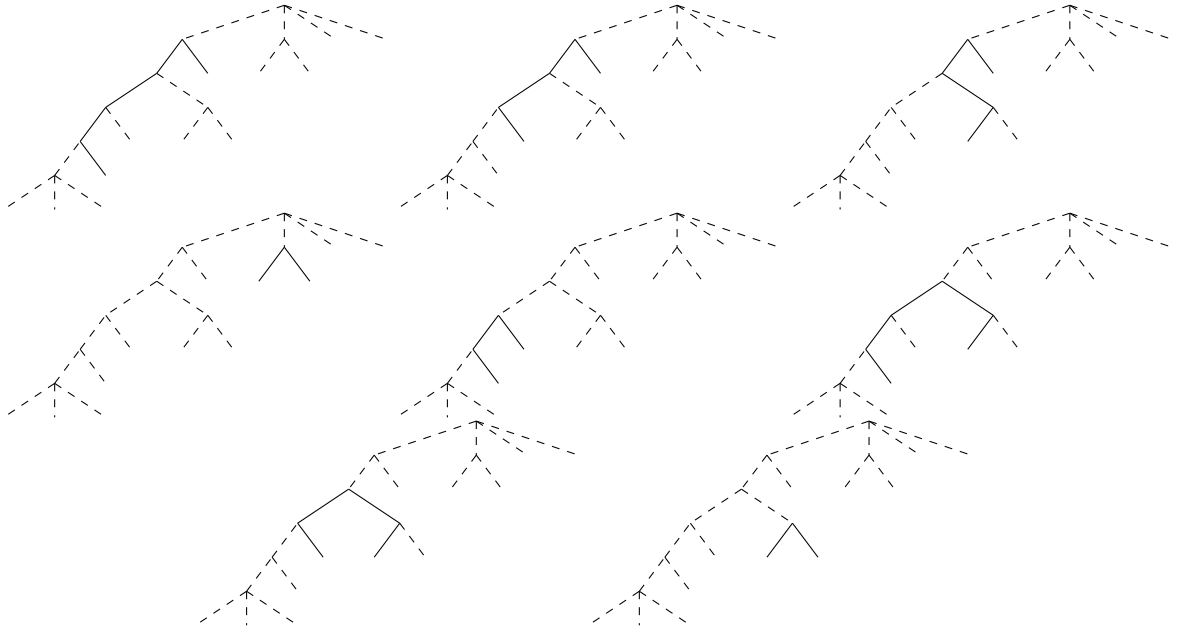
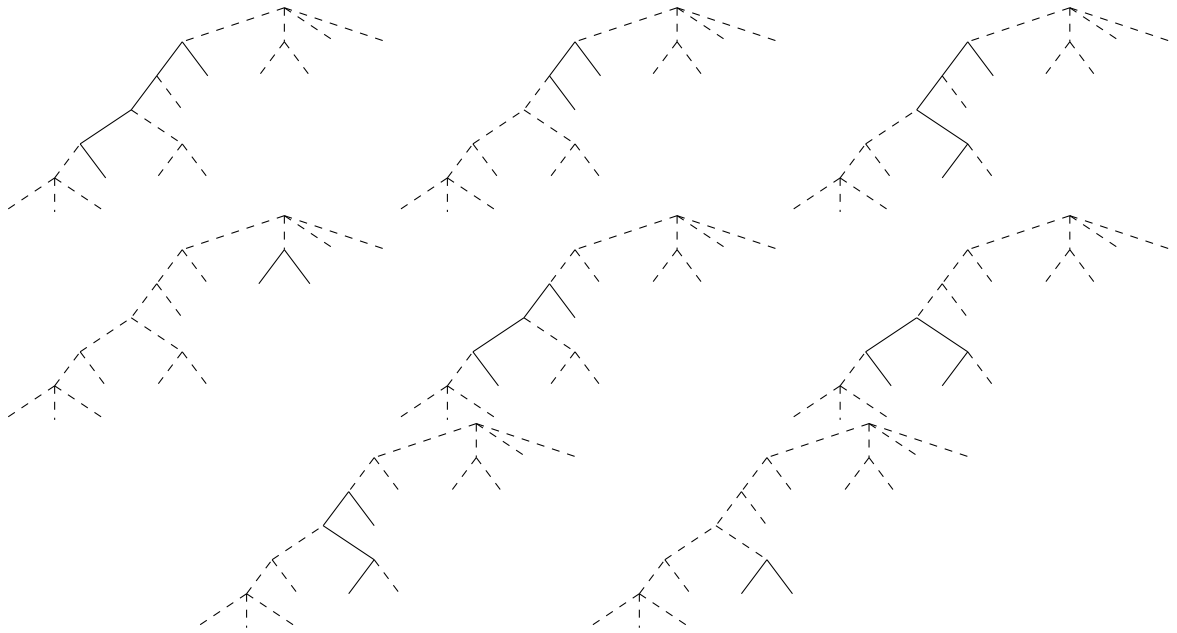


**Topology 363**

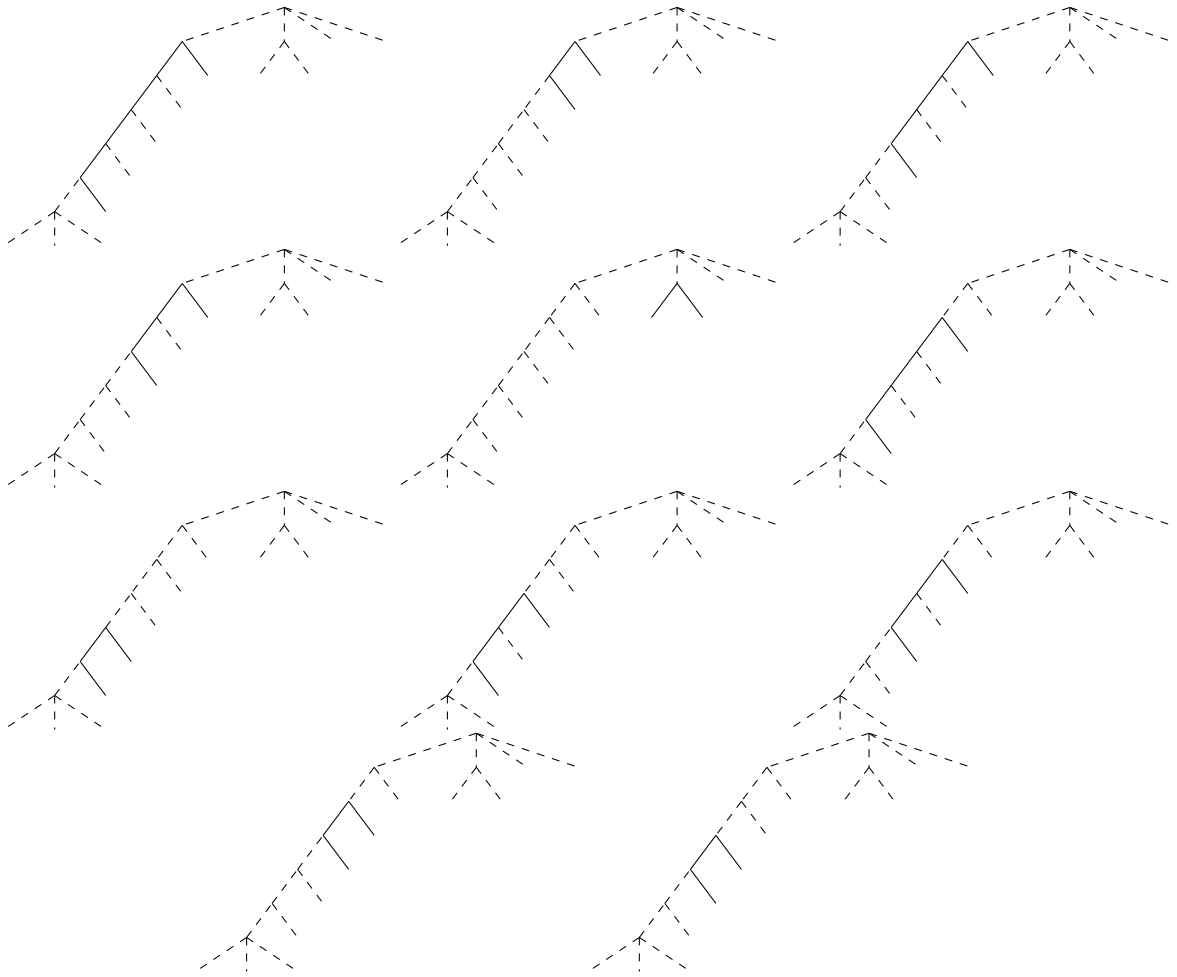


**Topology 364**

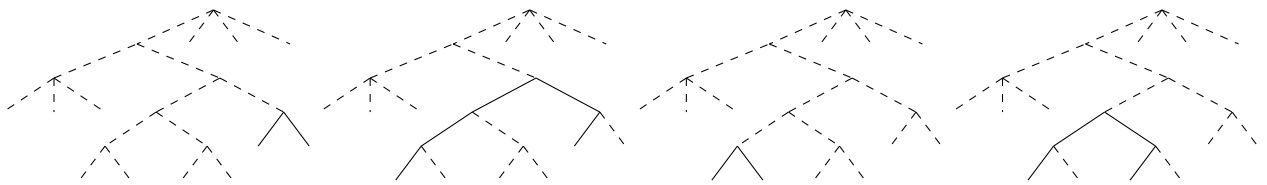


**Topology 365****Topology 366****Topology 367**

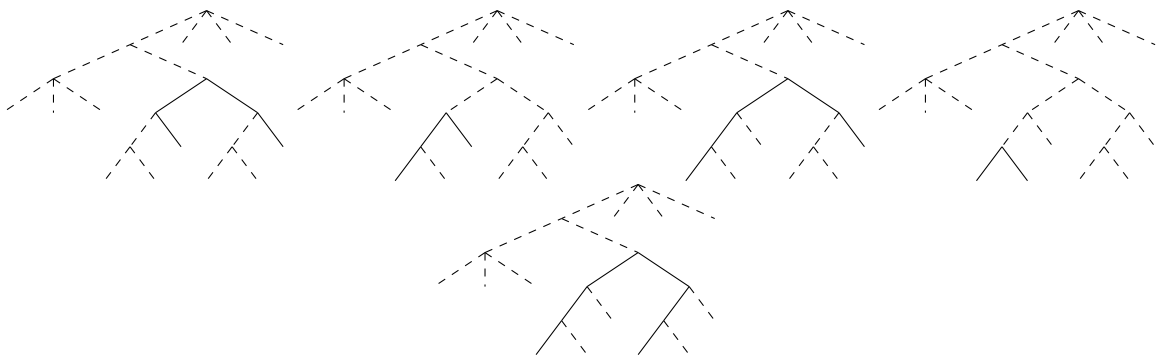




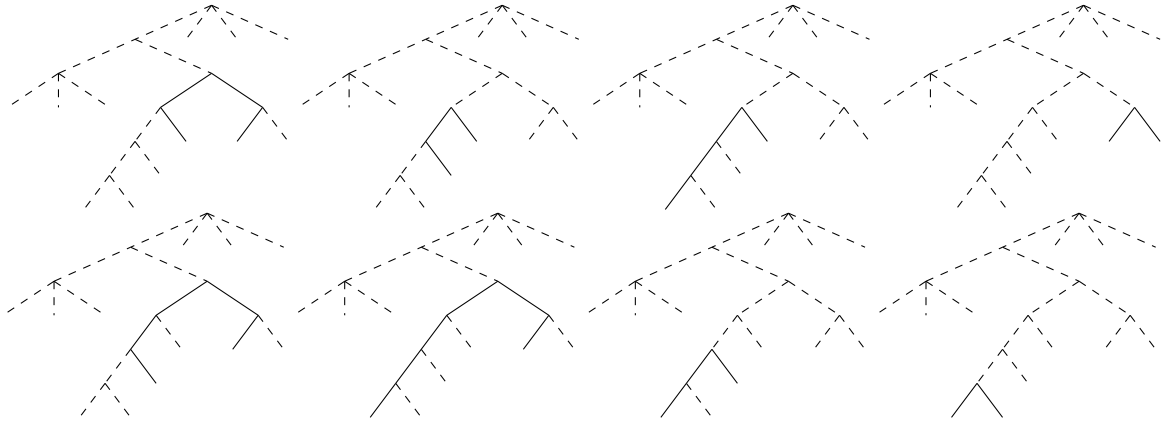
**Topology 368**



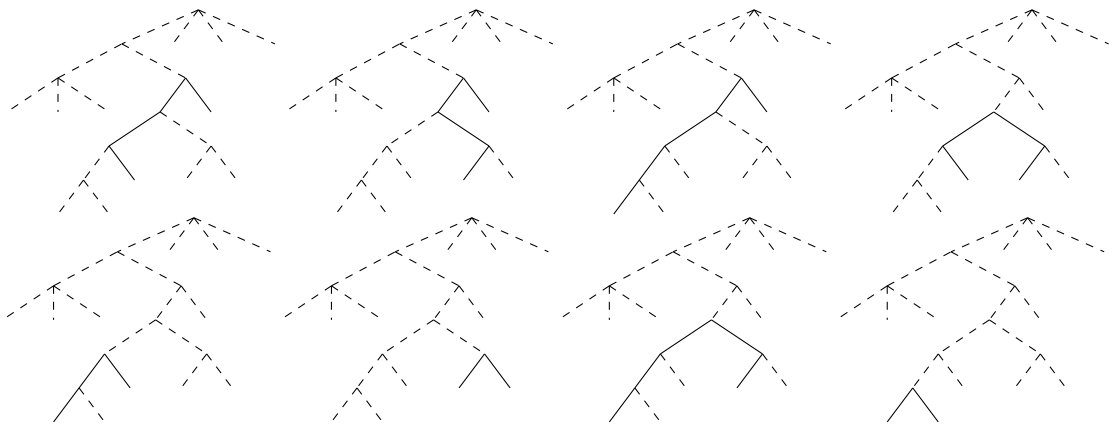
**Topology 369**



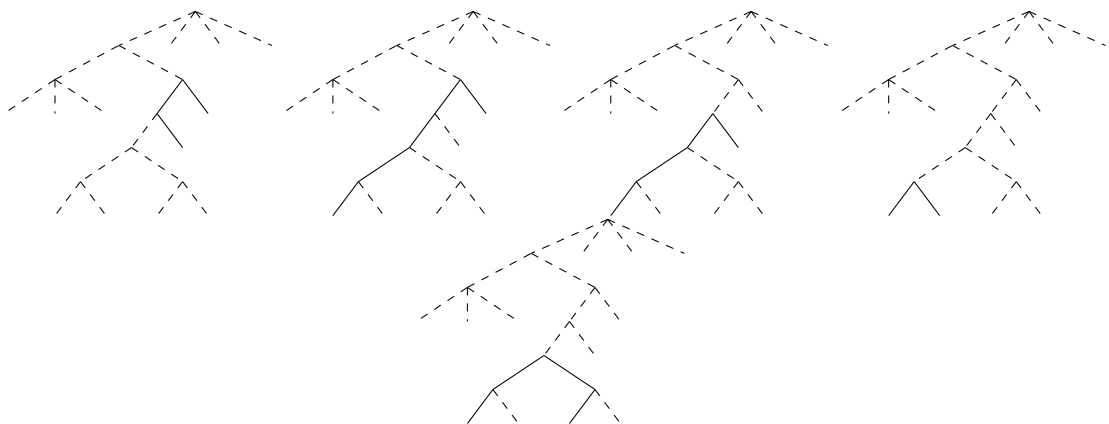
**Topology 370**



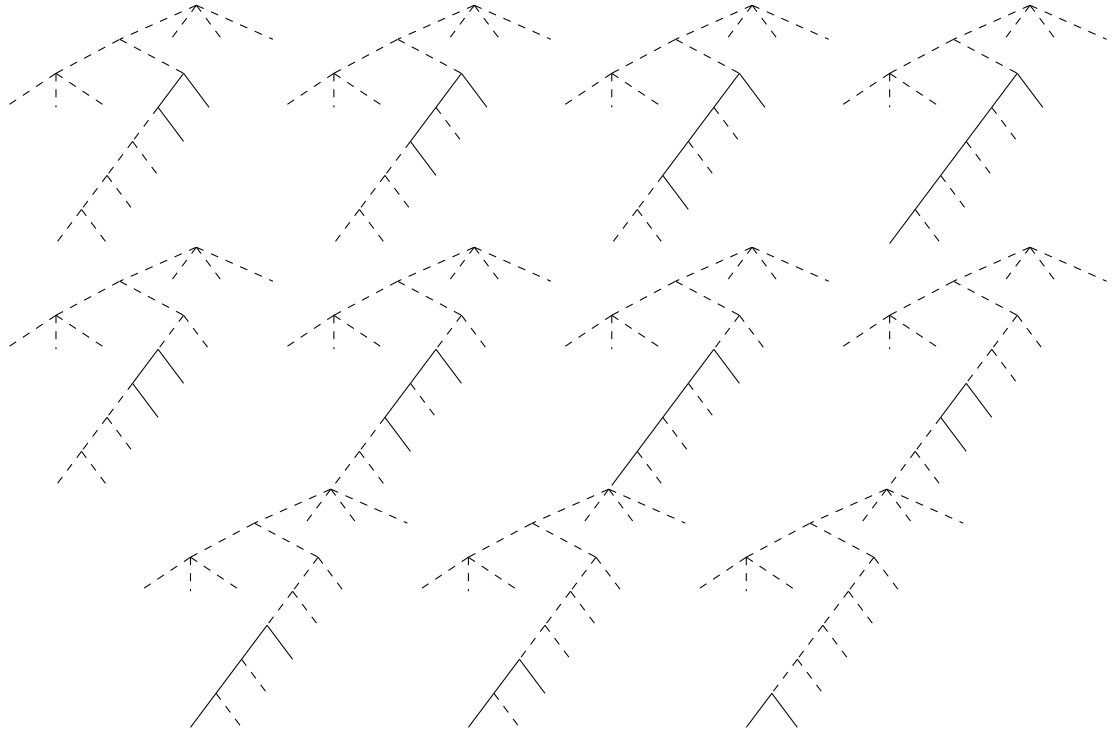
**Topology 371**



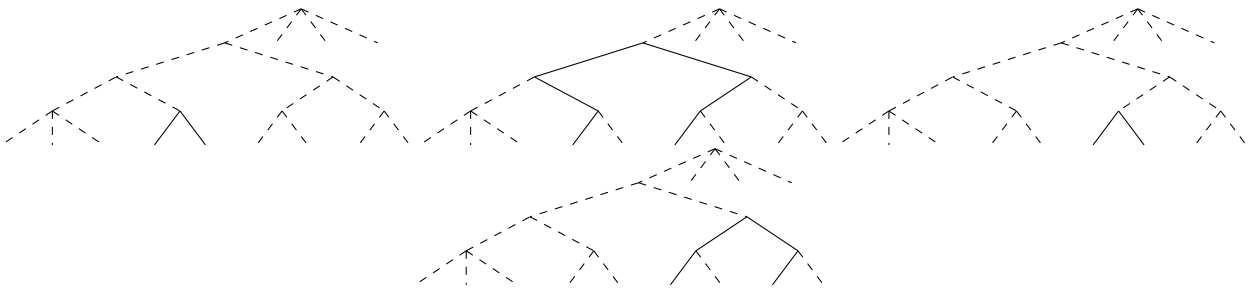
**Topology 372**



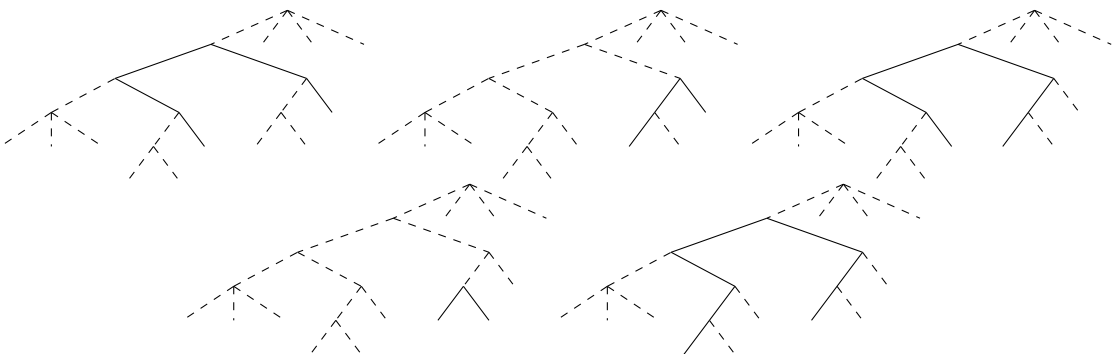
**Topology 373**



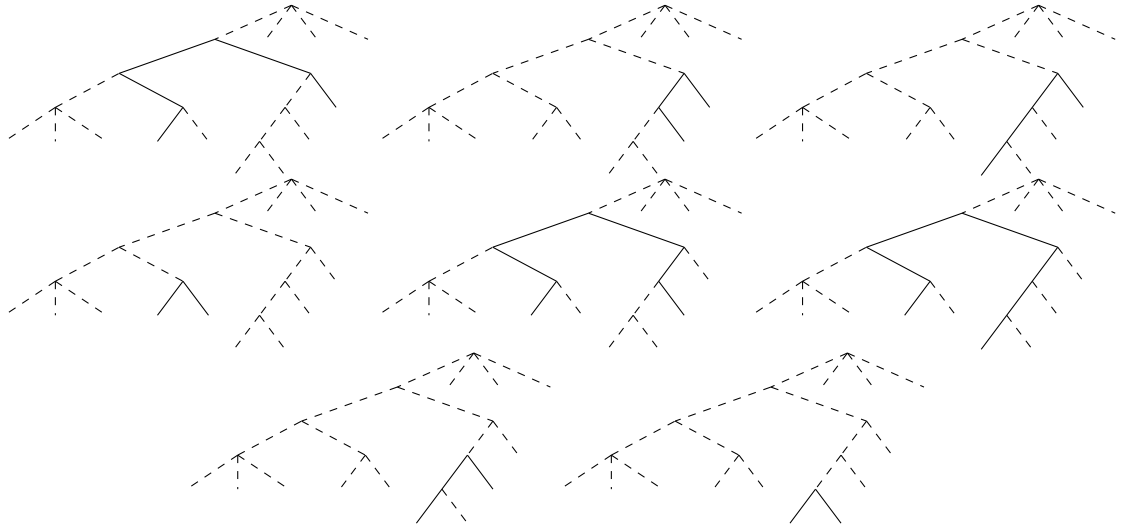
**Topology 374**



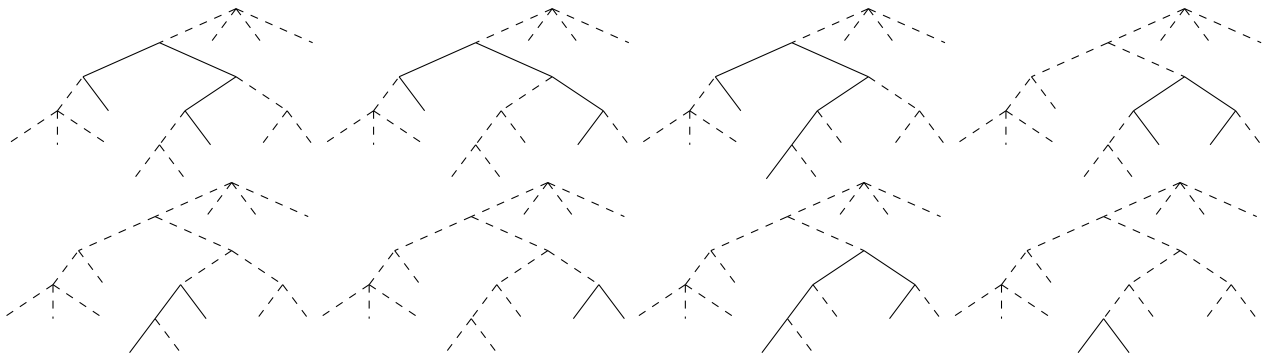
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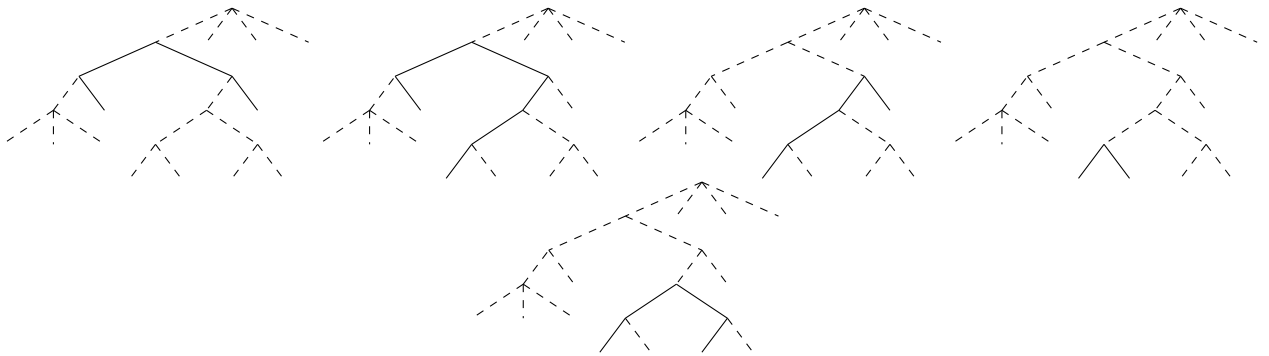
**Topology 376**

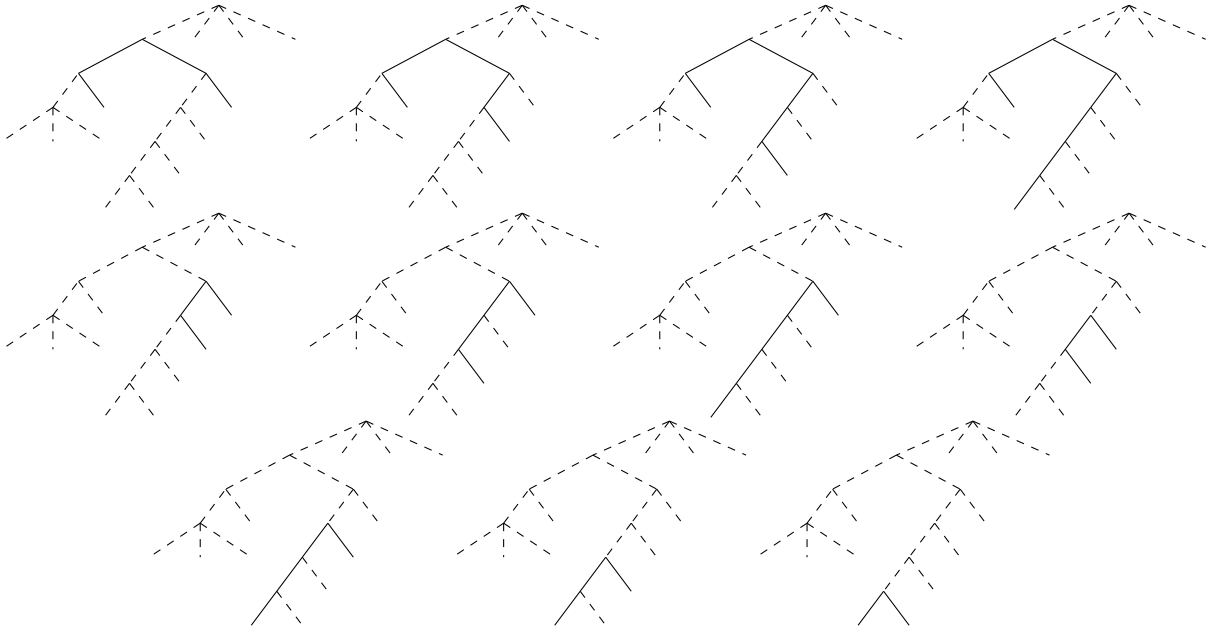
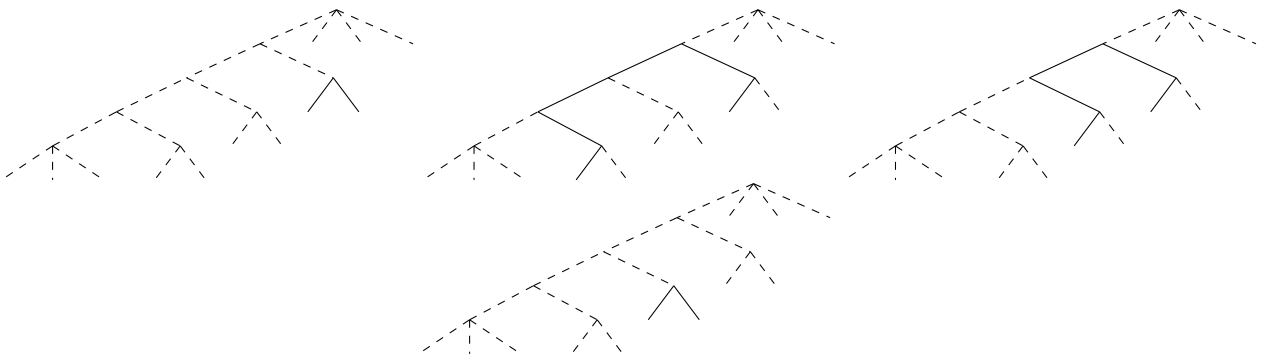
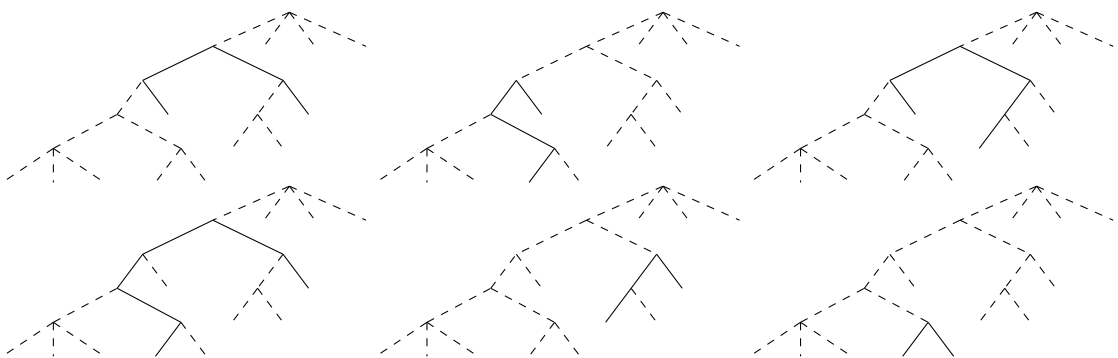


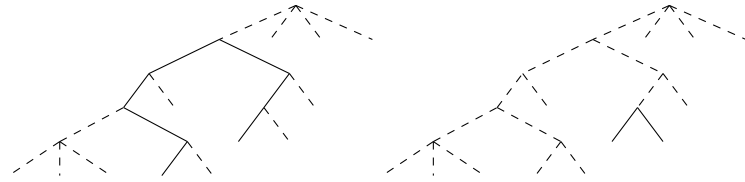
**Topology 377**



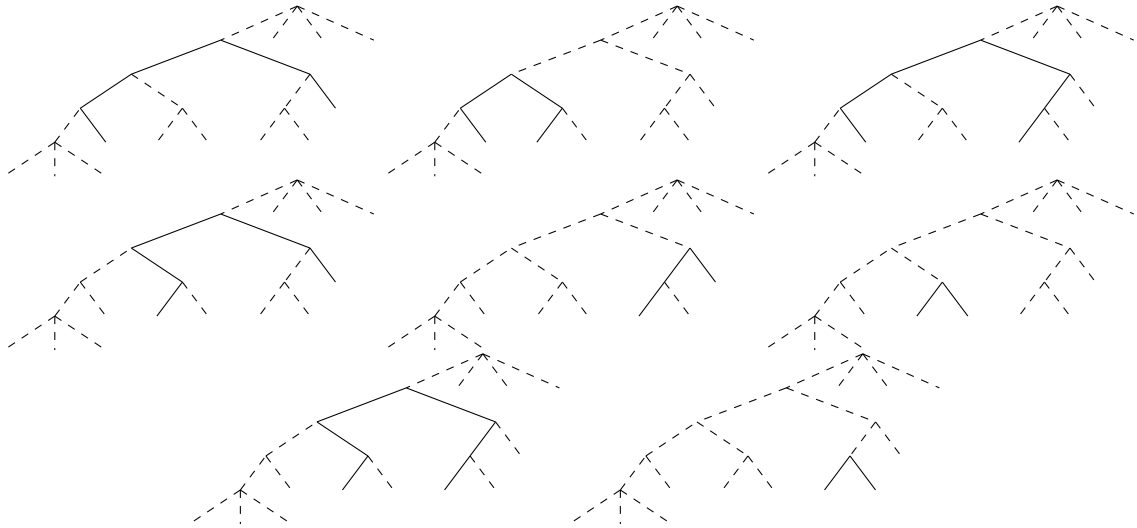
**Topology 378**



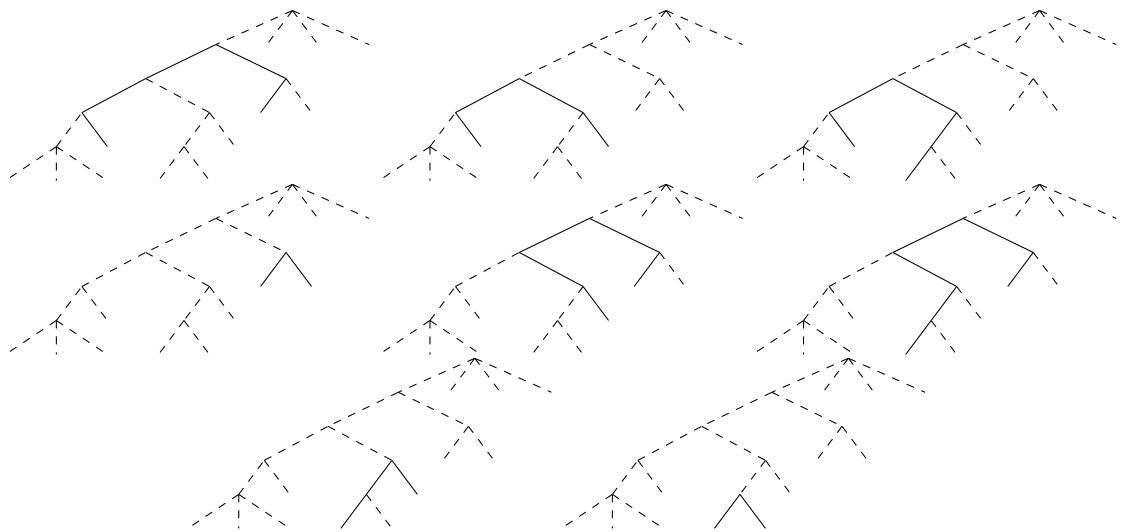
**Topology 379****Topology 380****Topology 381**



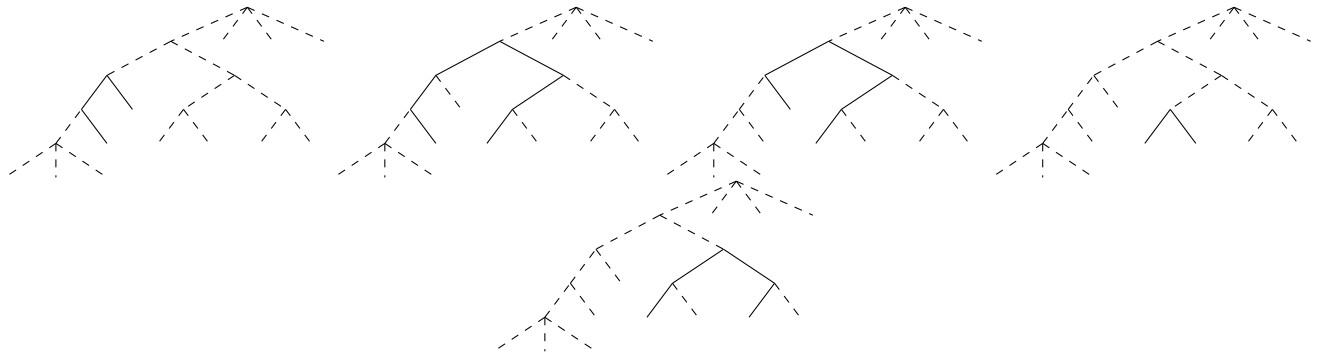
**Topology 382**



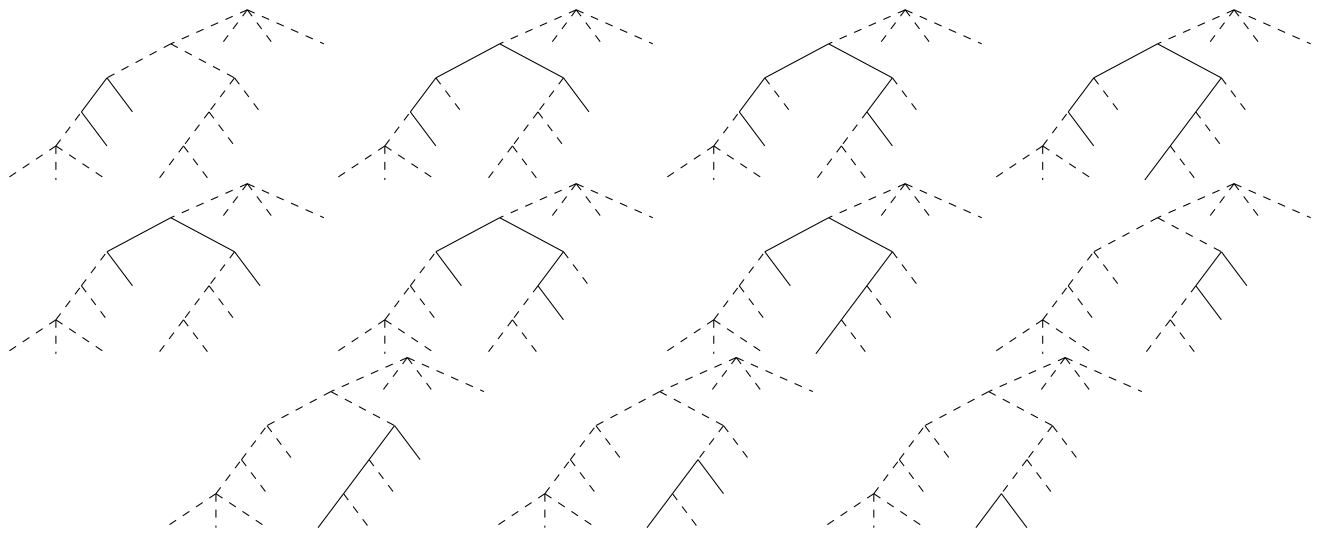
**Topology 383**



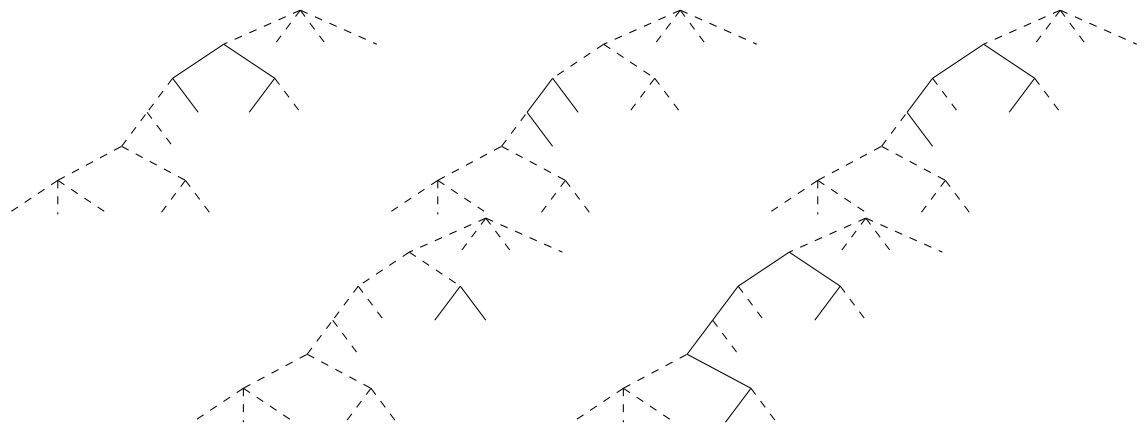
**Topology 384**



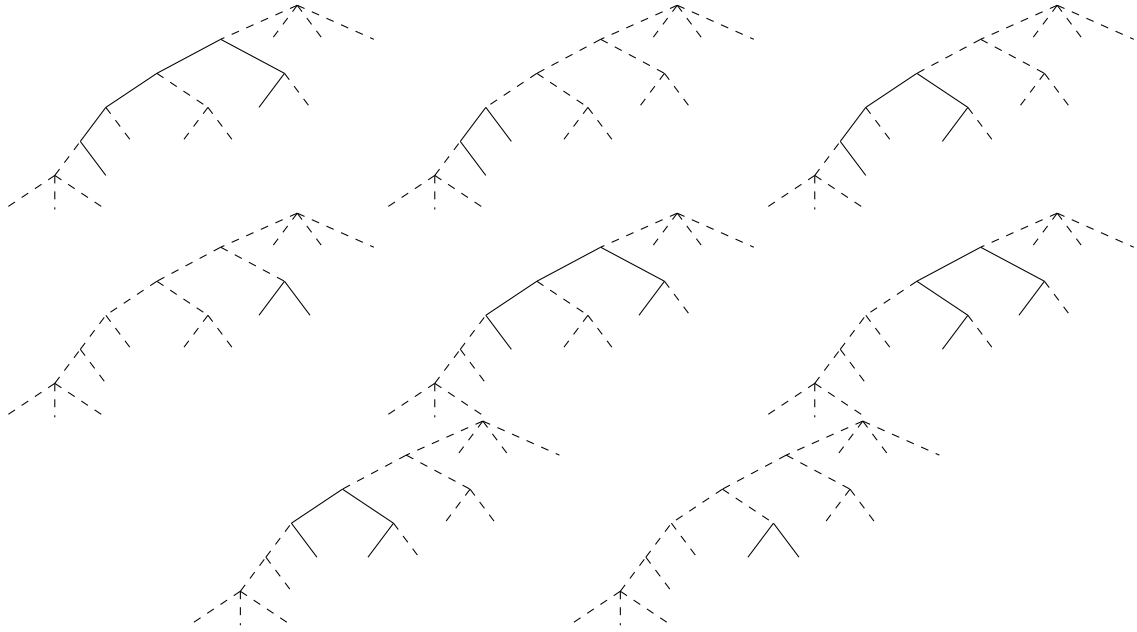
**Topology 385**



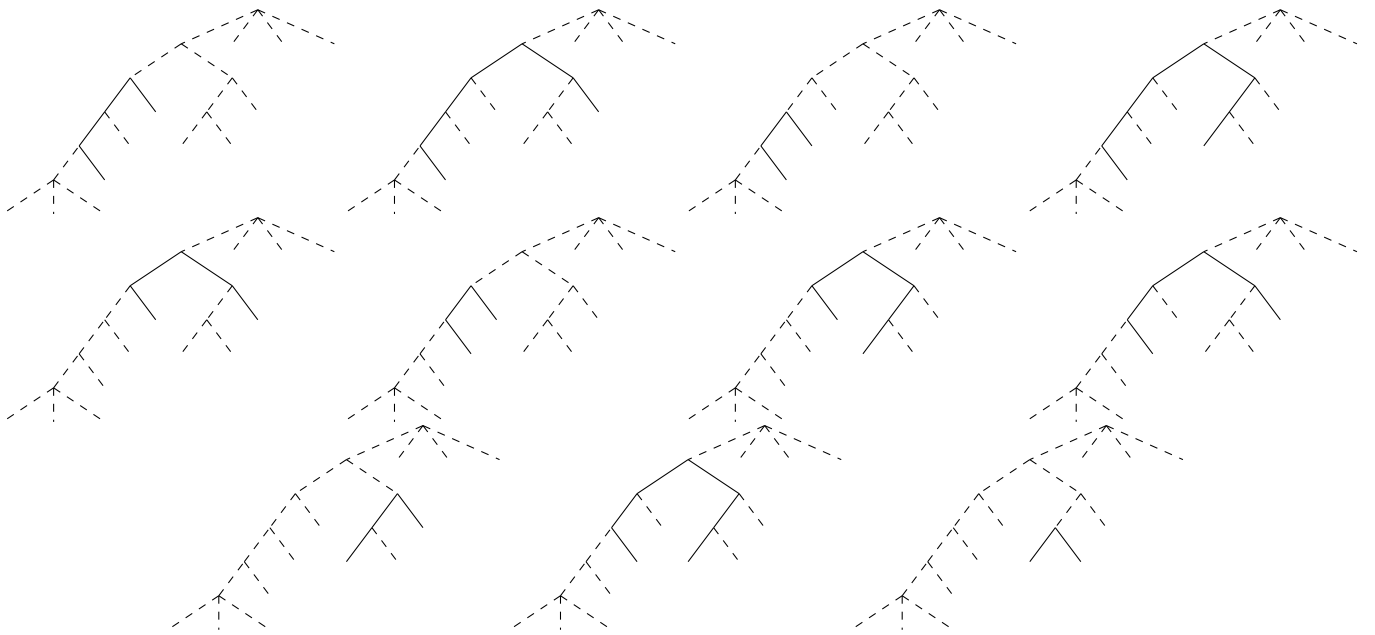
**Topology 386**



**Topology 387**

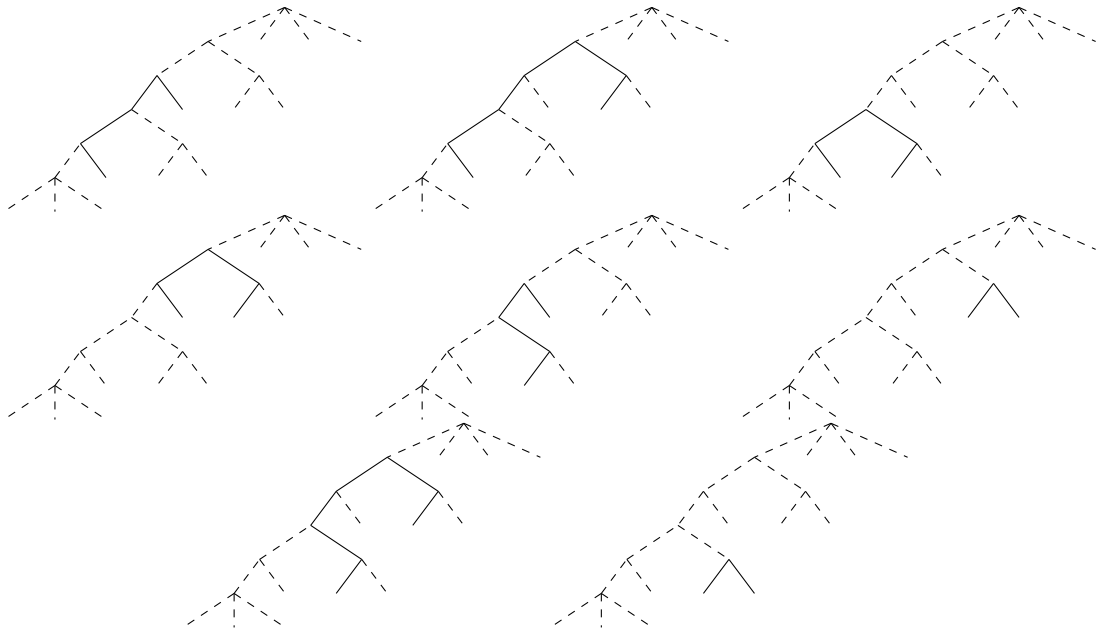


**Topology 388**

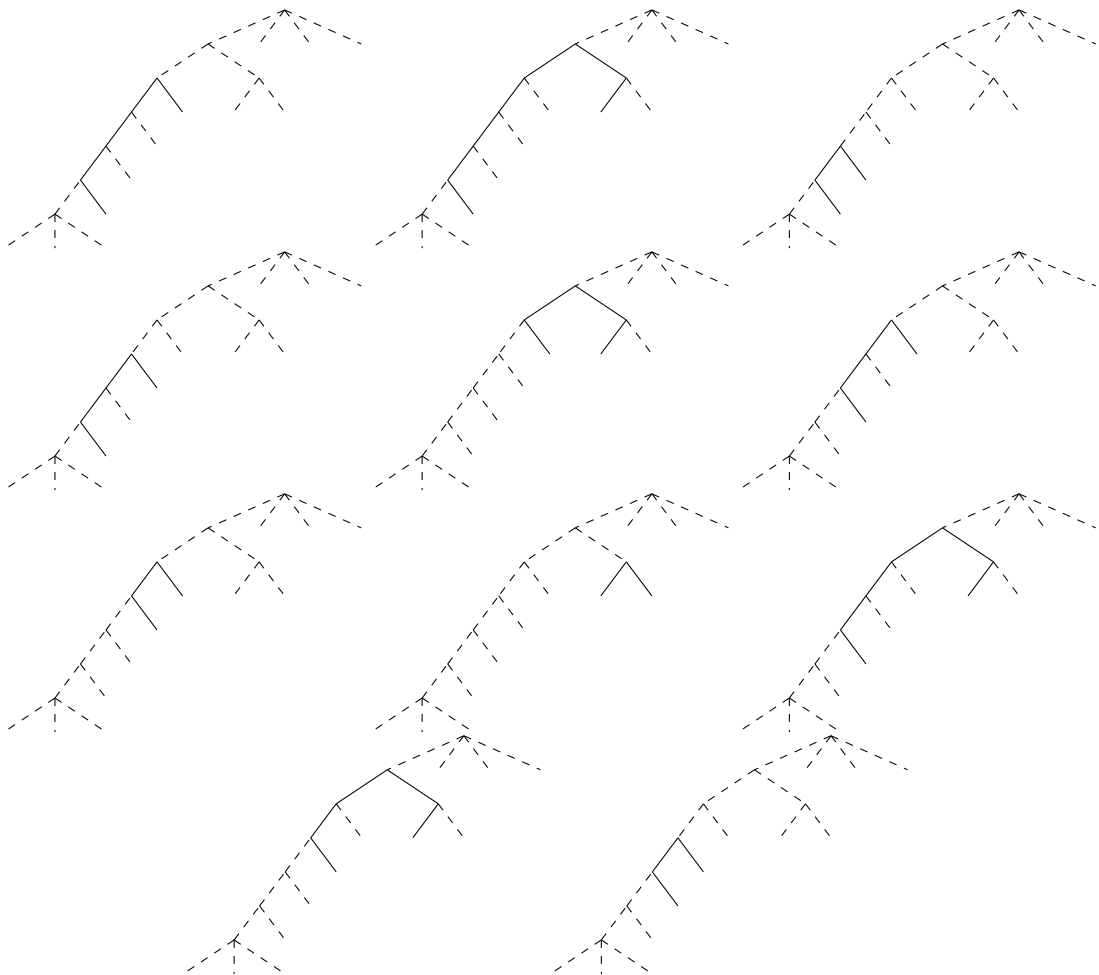


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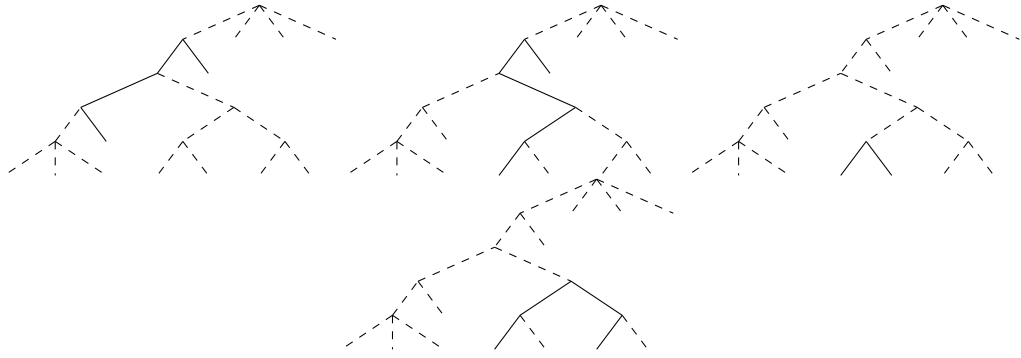




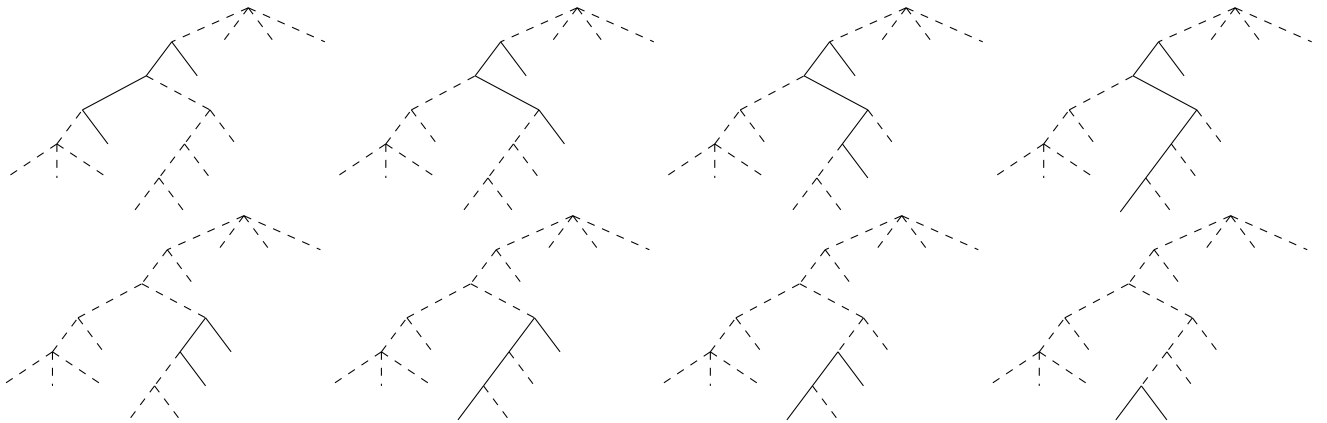
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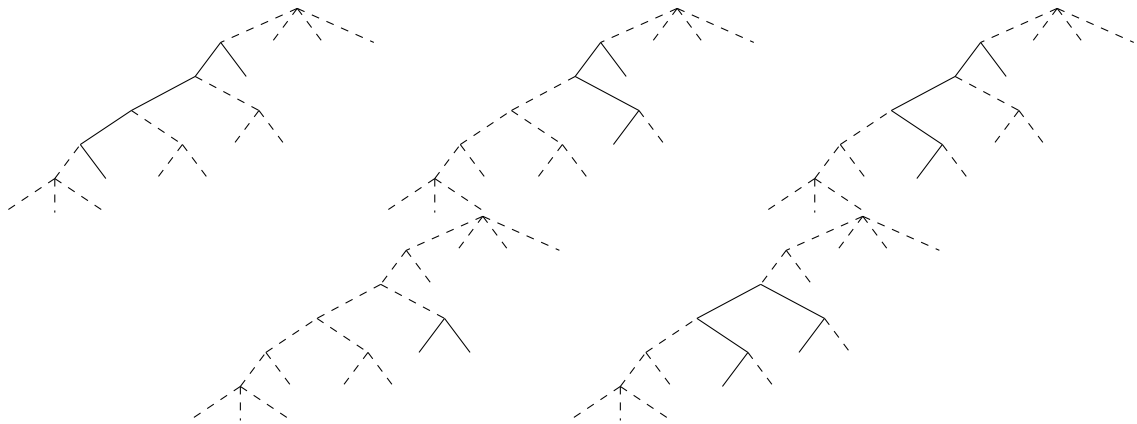
**Topology 391**



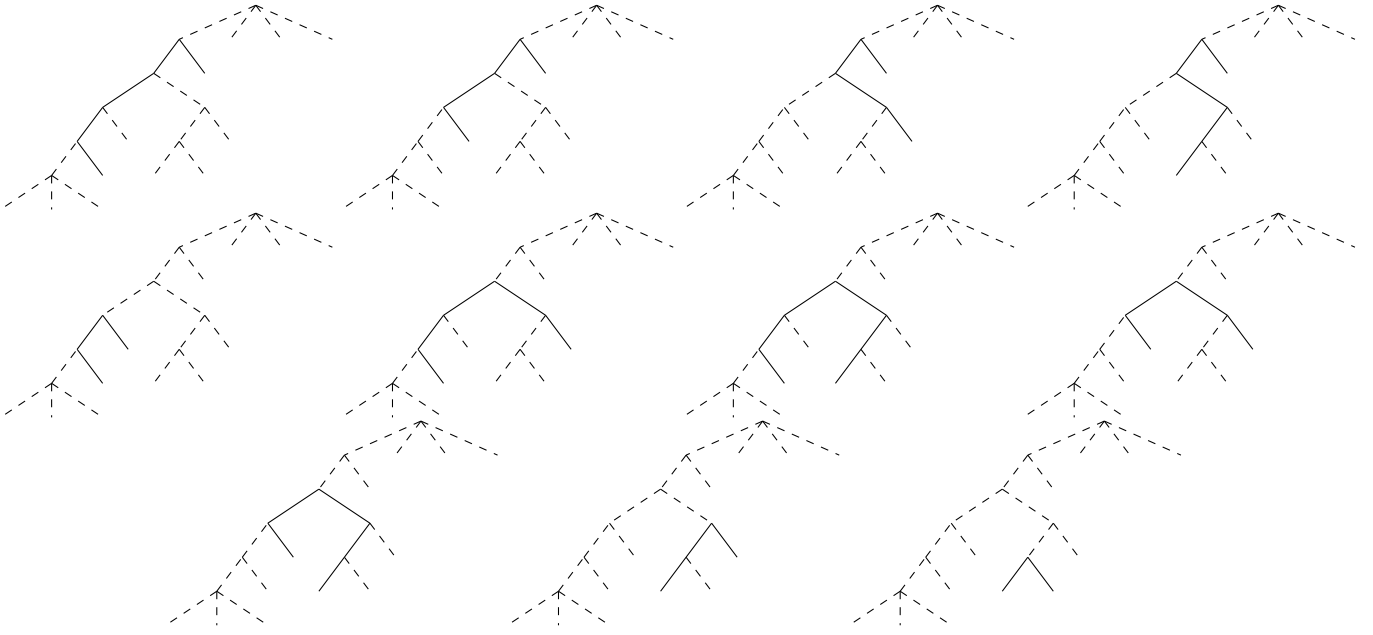
**Topology 392**



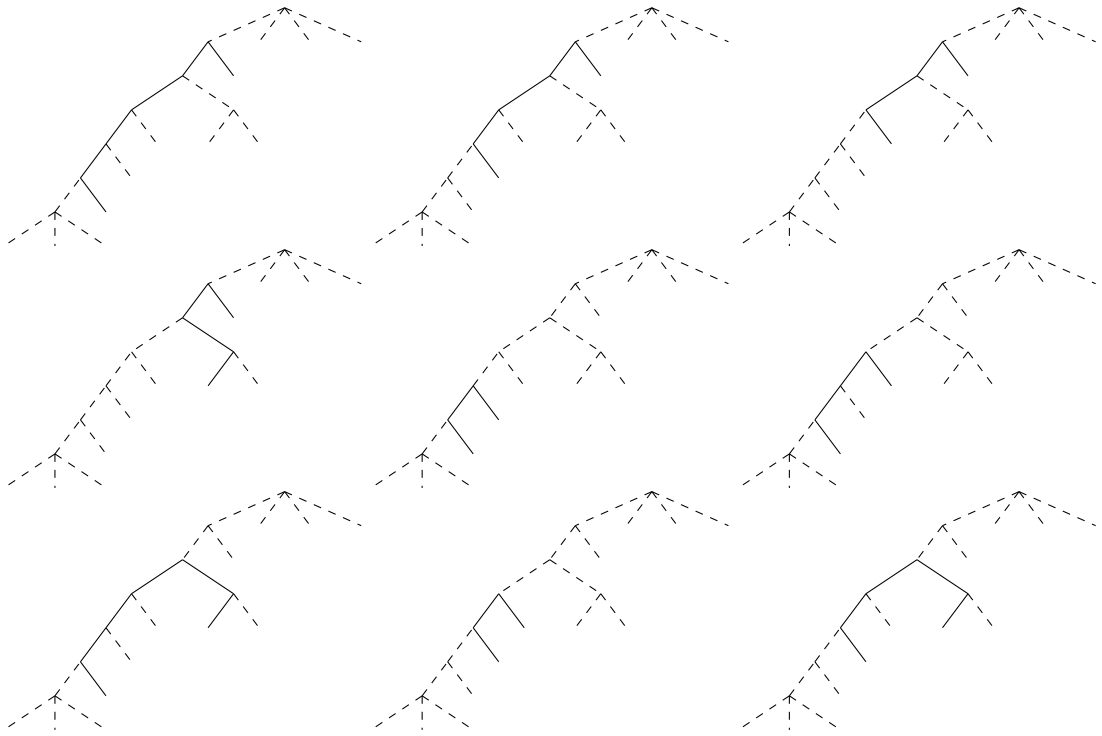
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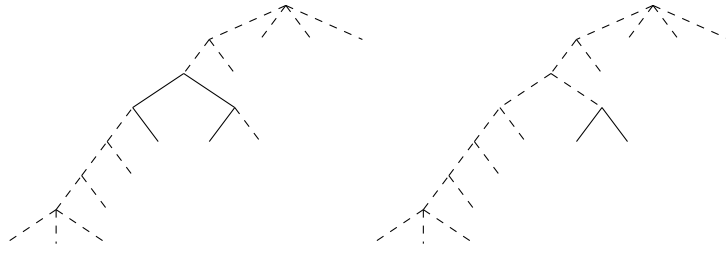


**Topology 394**

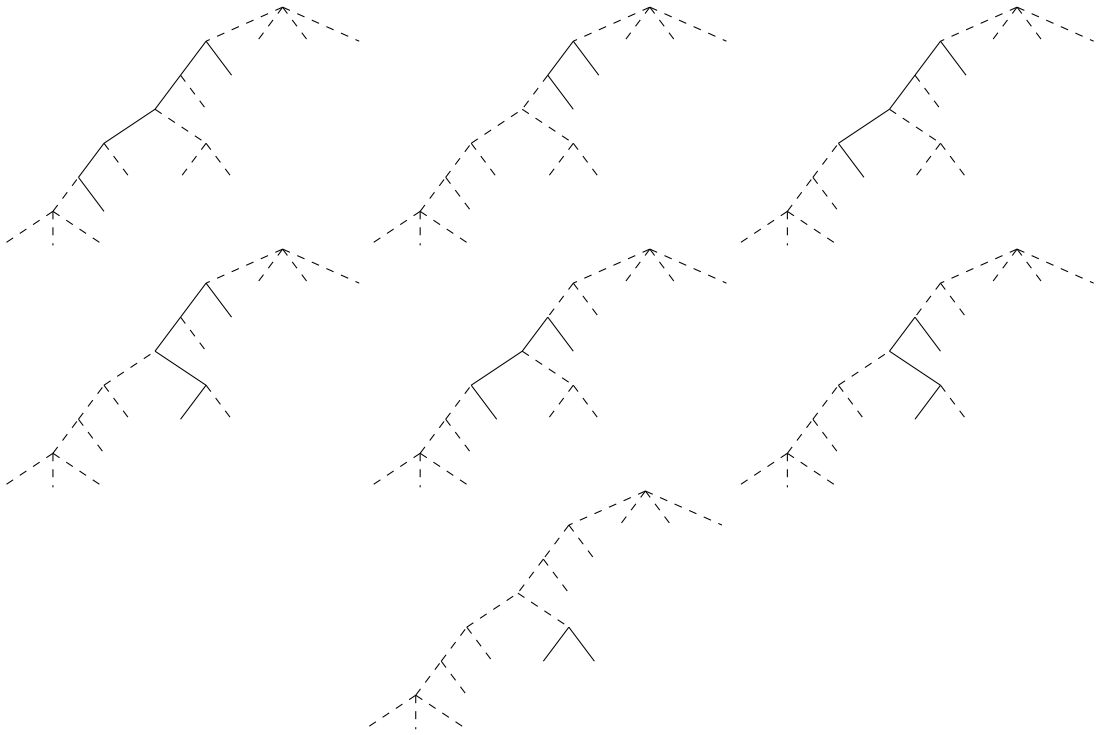


**Topology 395**

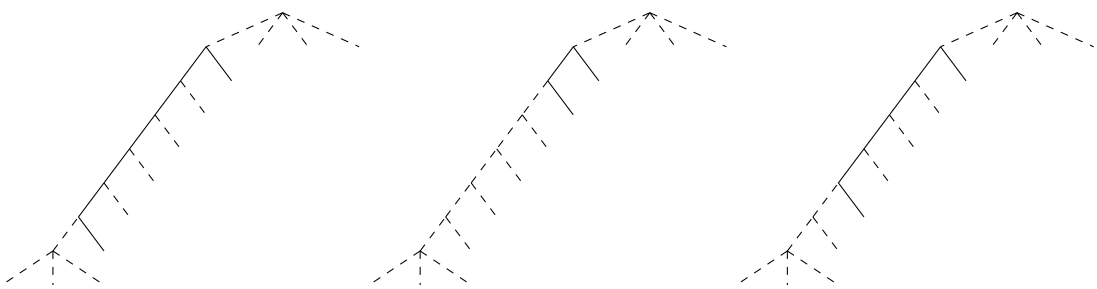


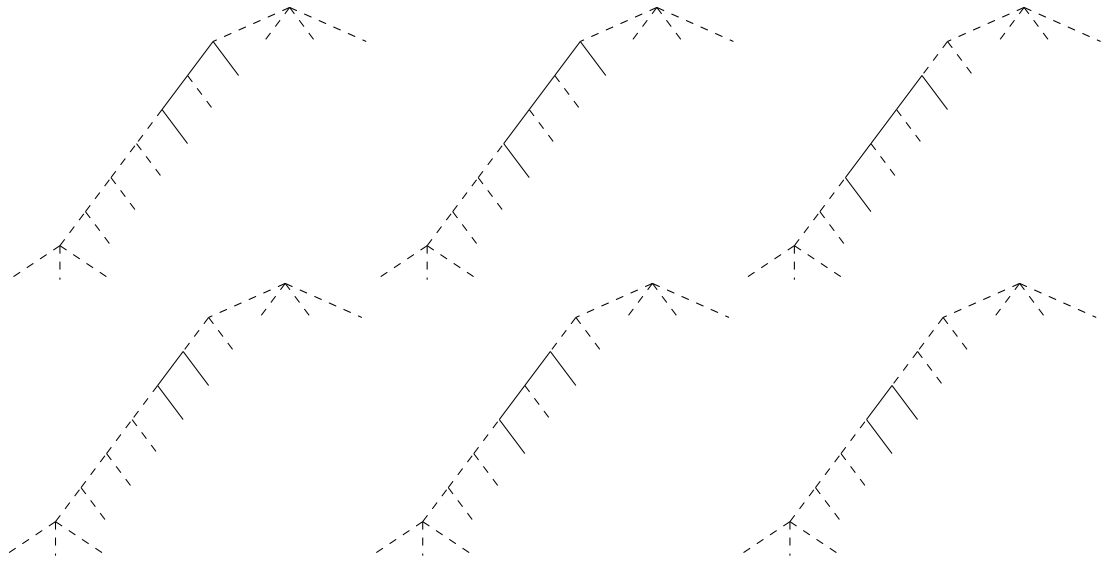
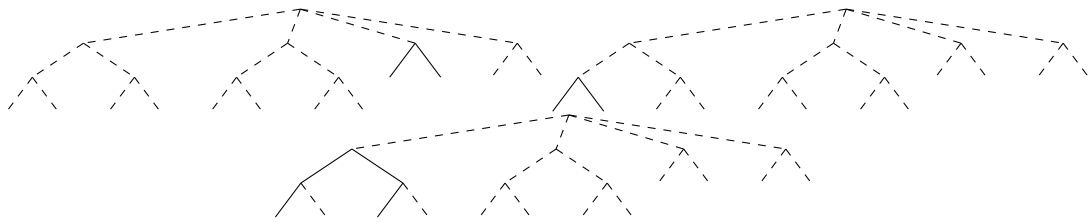
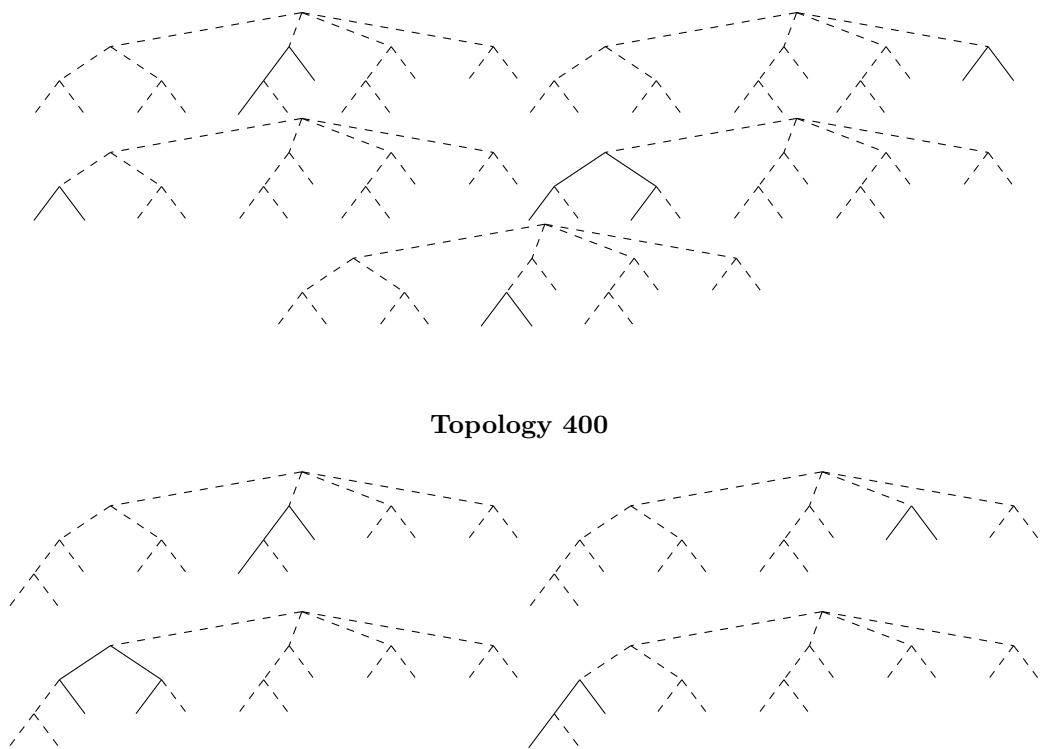


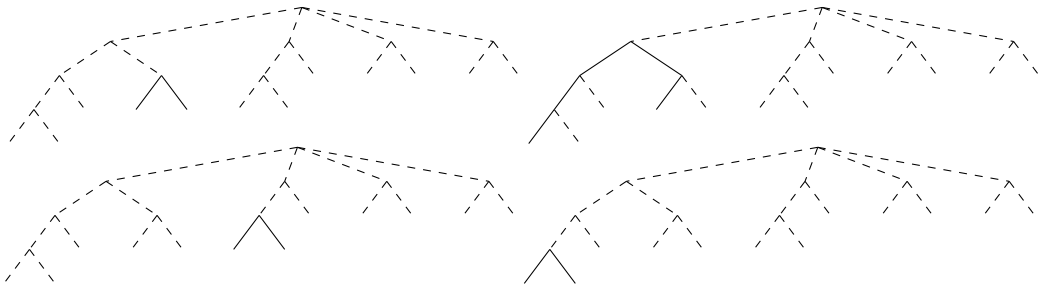
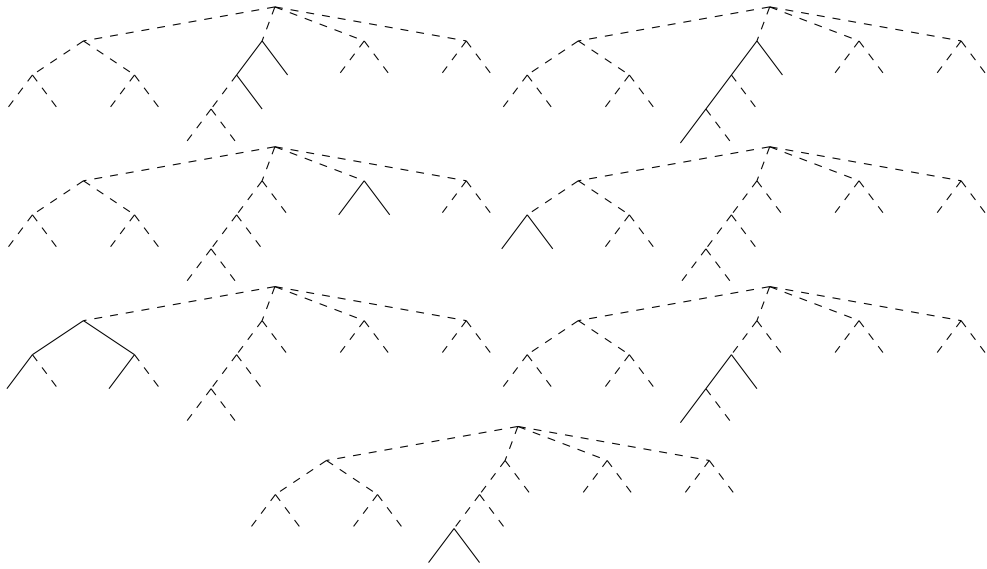
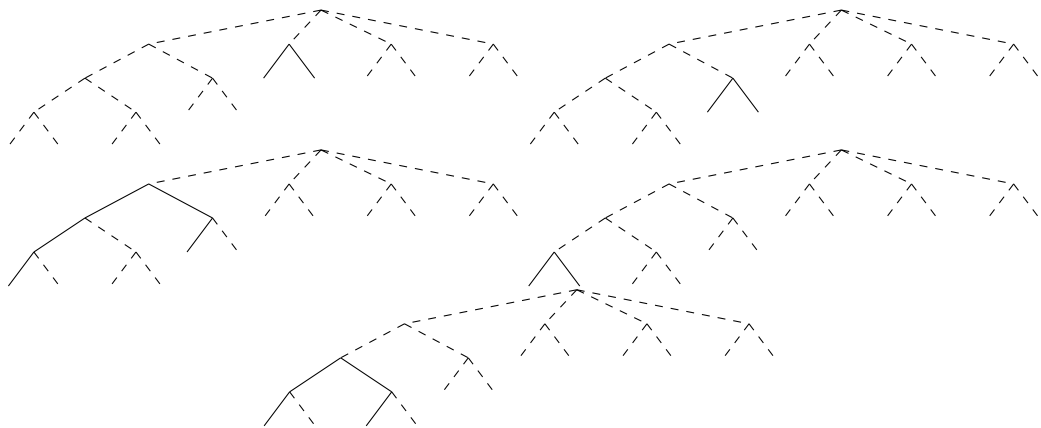
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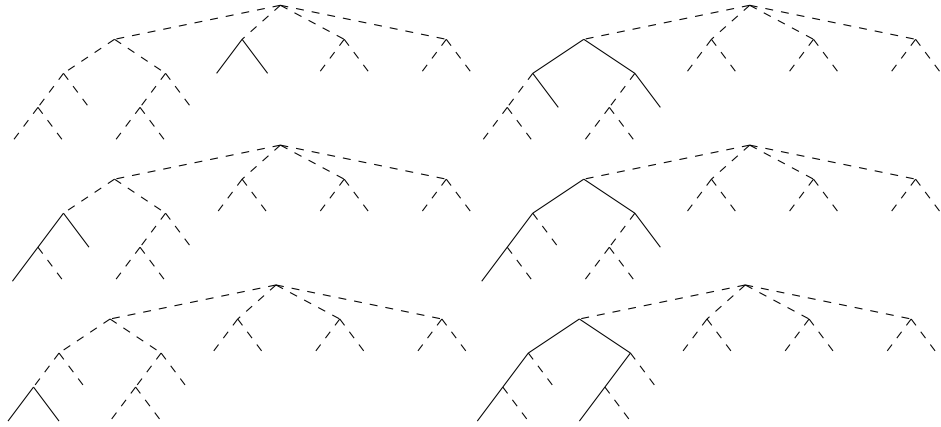


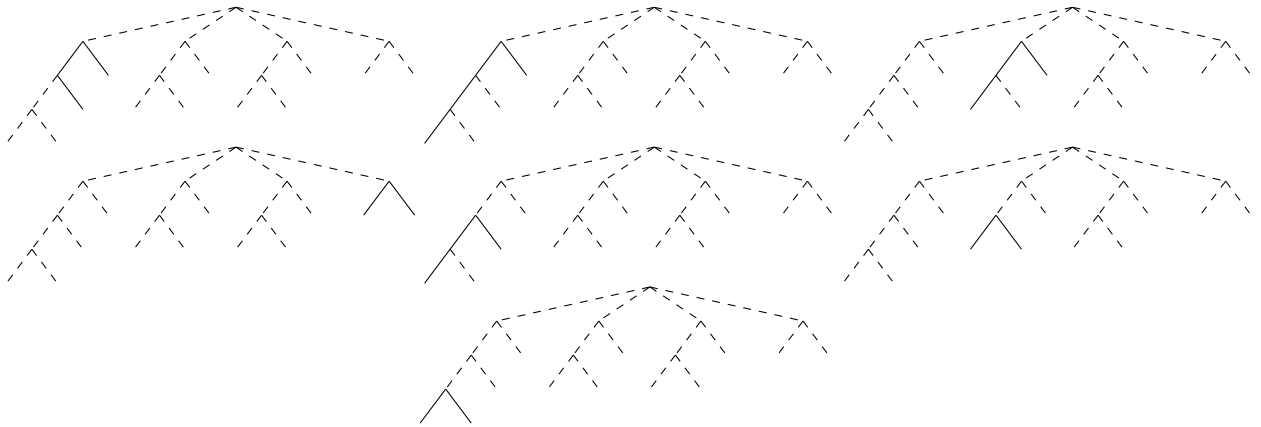
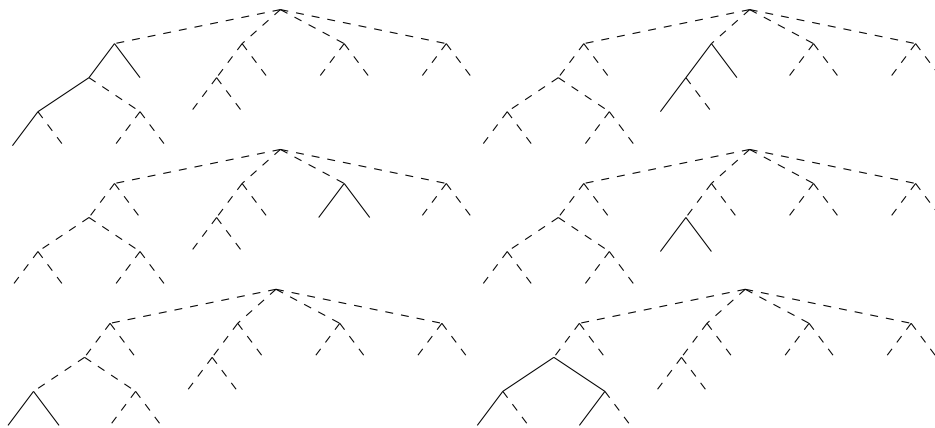
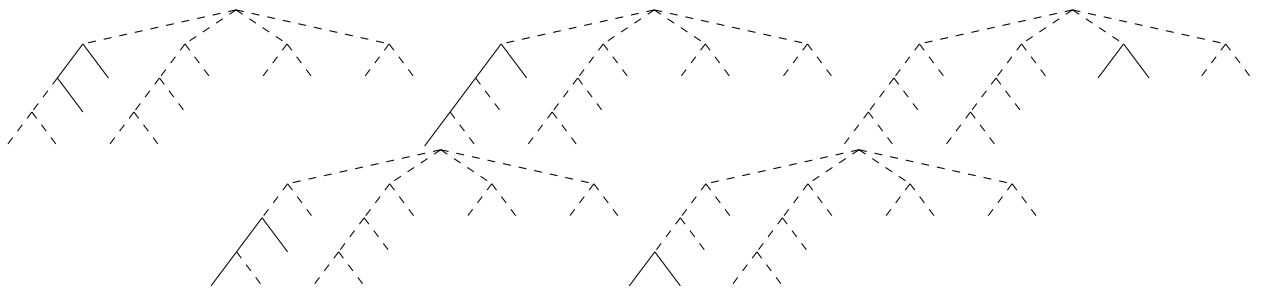
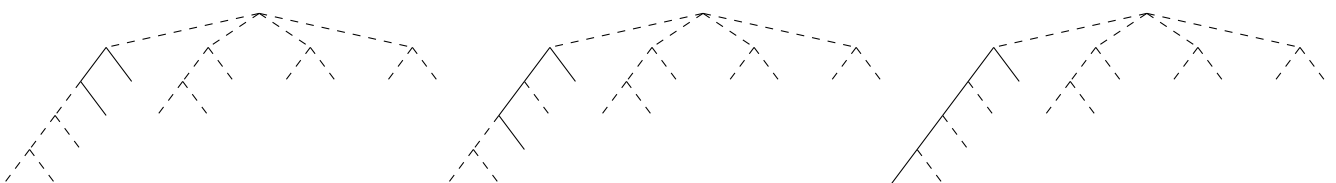
**Topology 397**



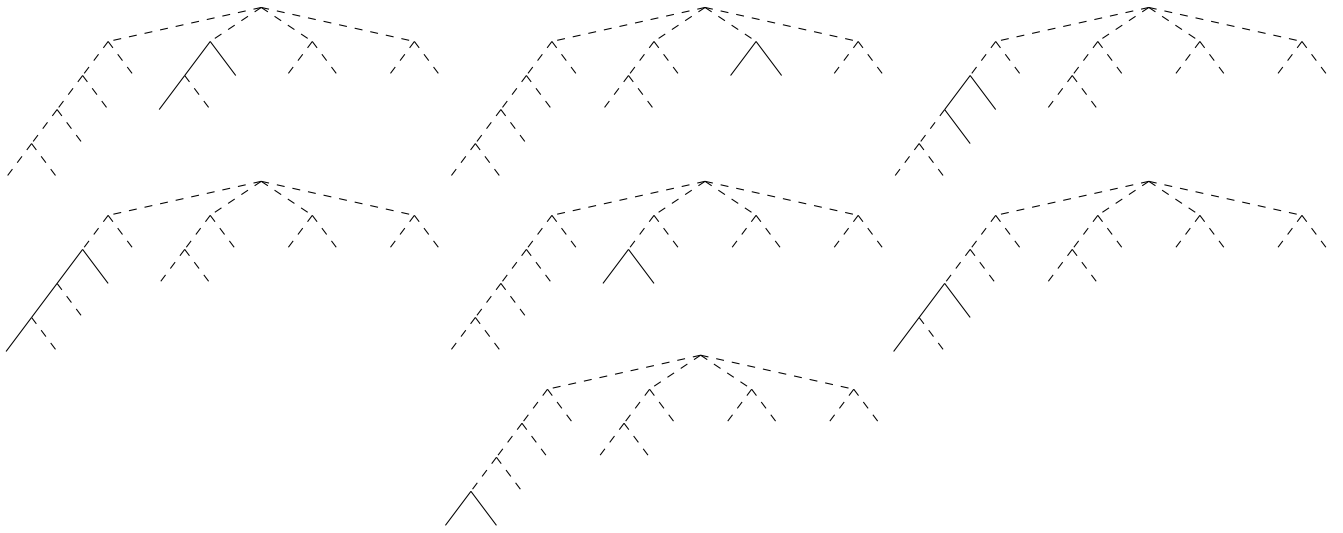
**Topology 398****Topology 399**

**Topology 401****Topology 402**

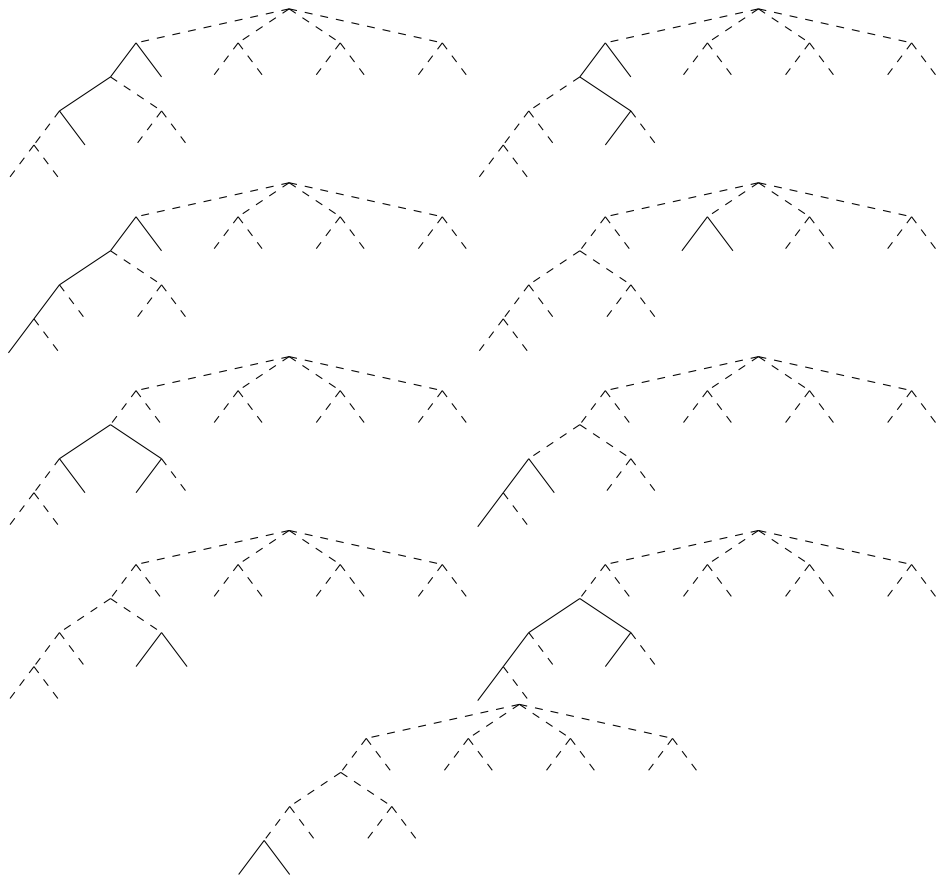
**Topology 403****Topology 404****Topology 405**

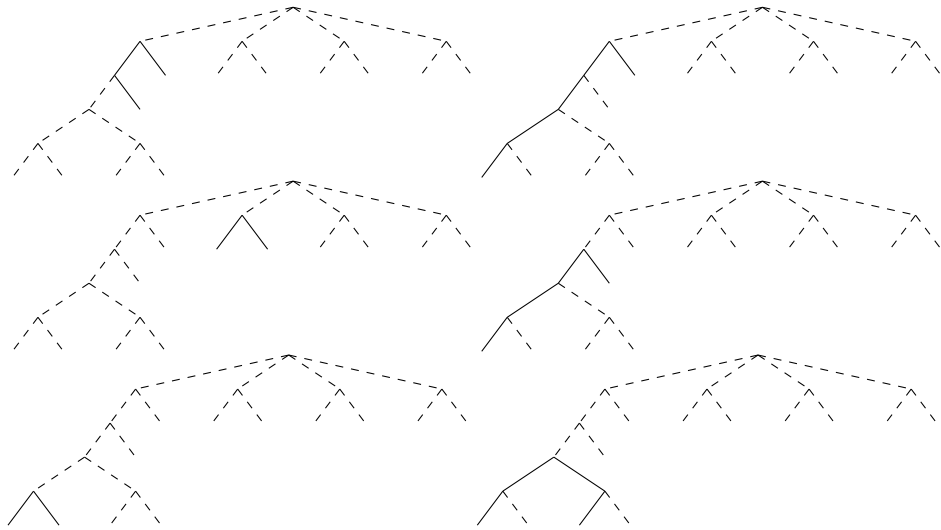
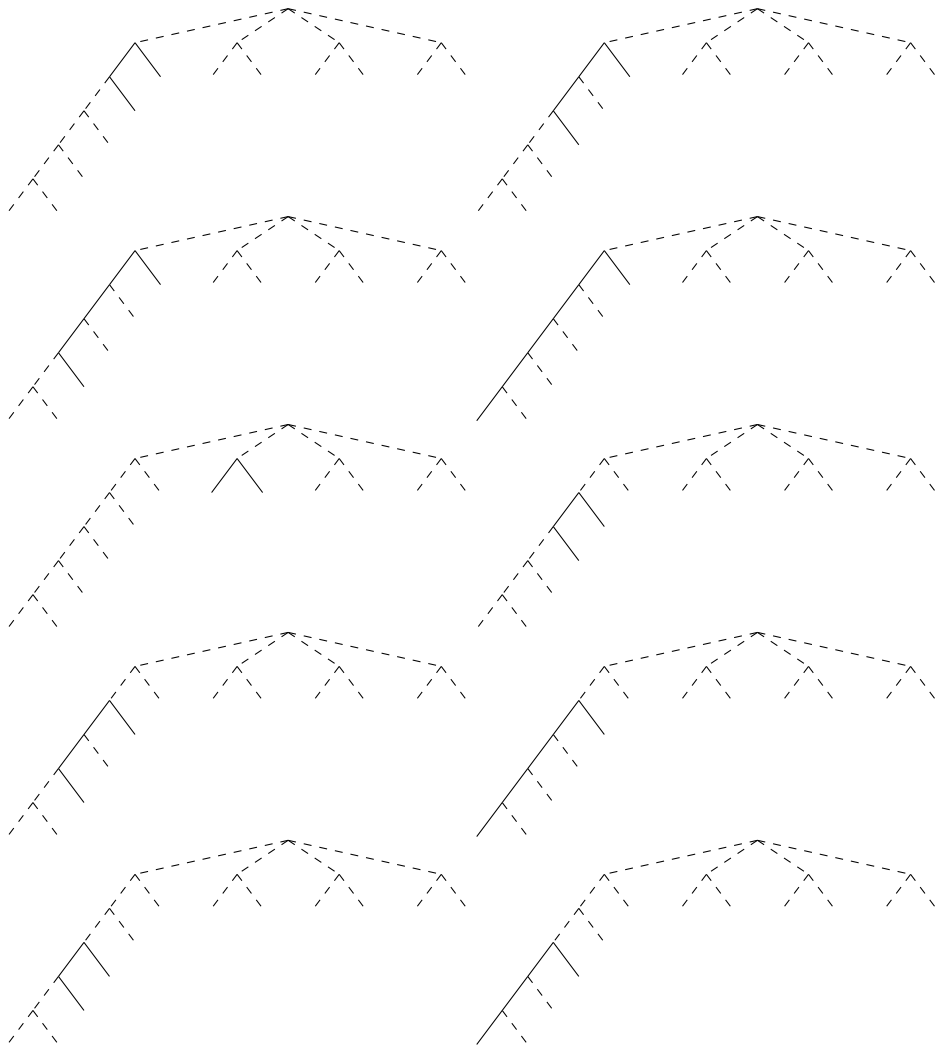
**Topology 406****Topology 407****Topology 408****Topology 409**

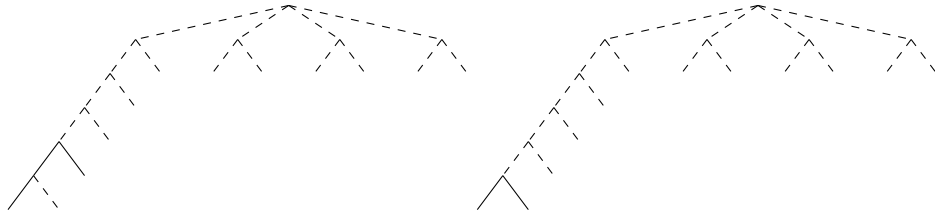
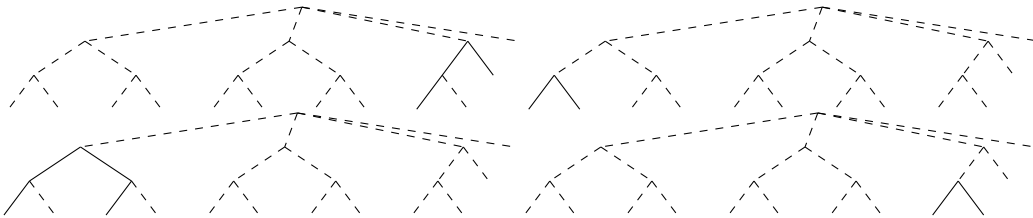
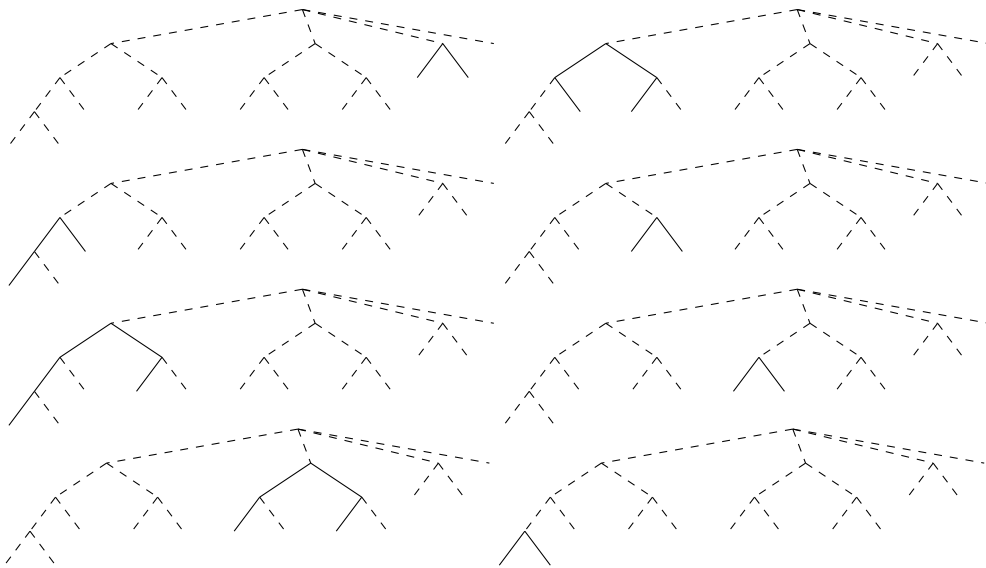
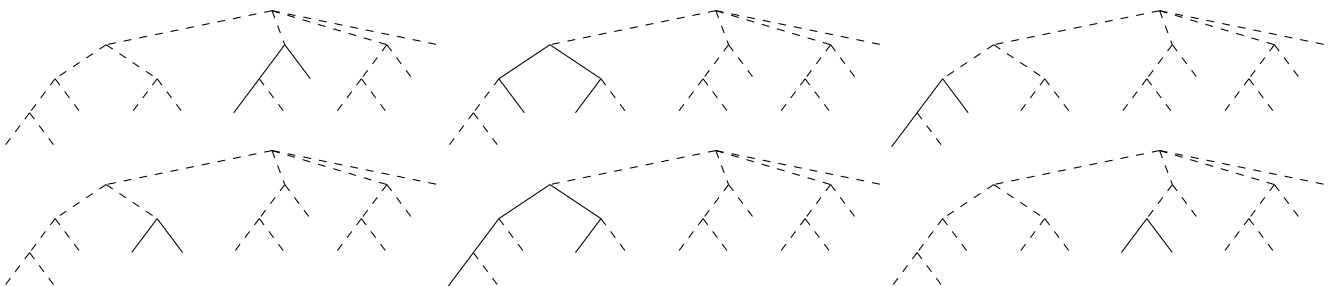


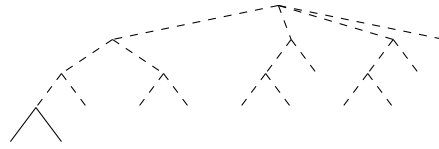
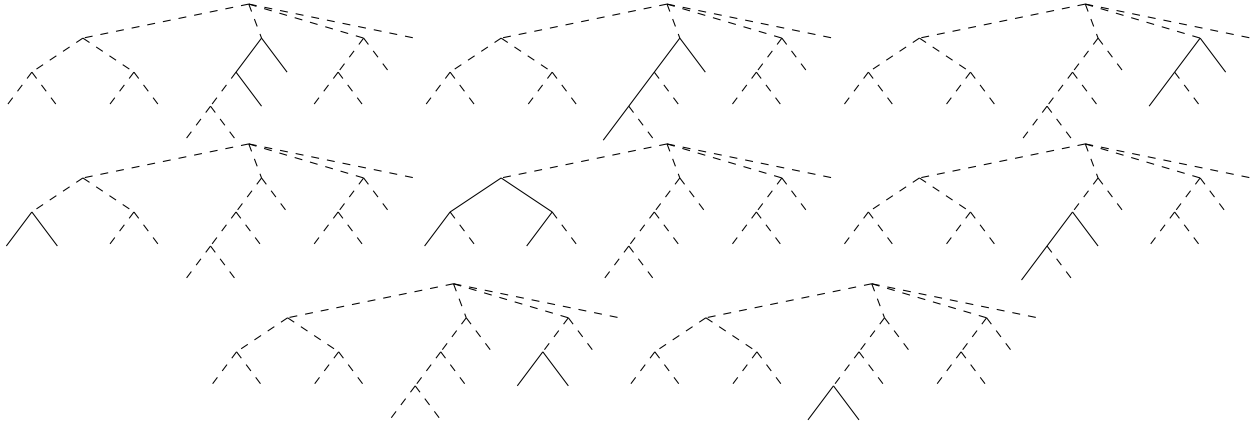
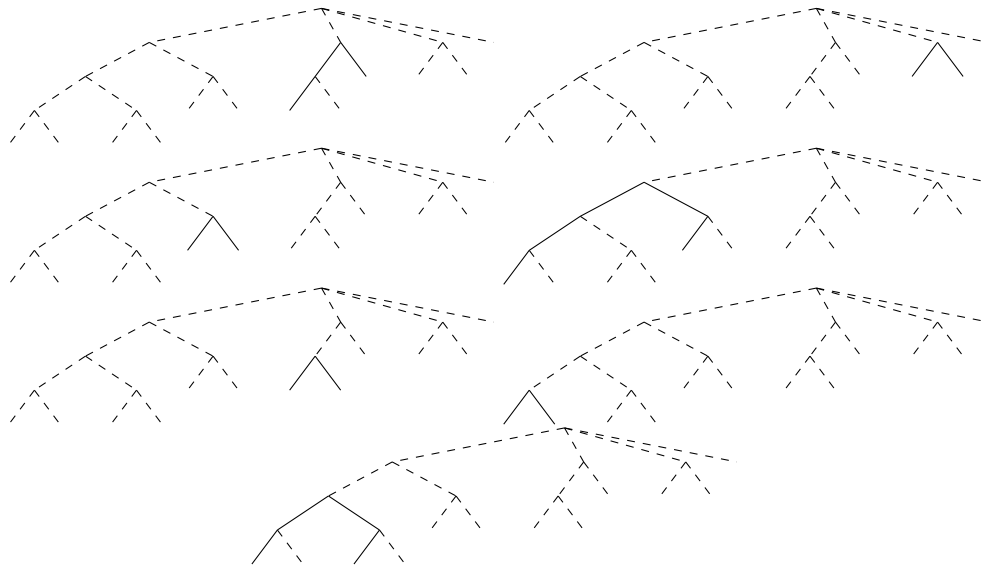
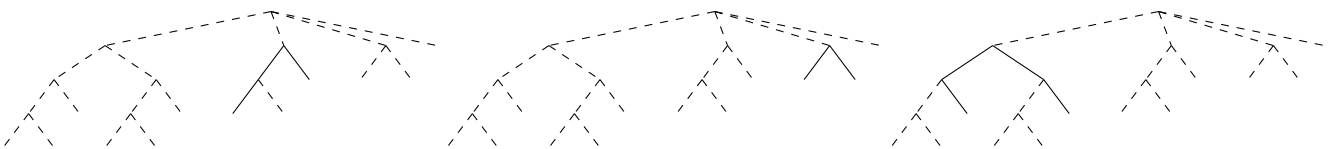


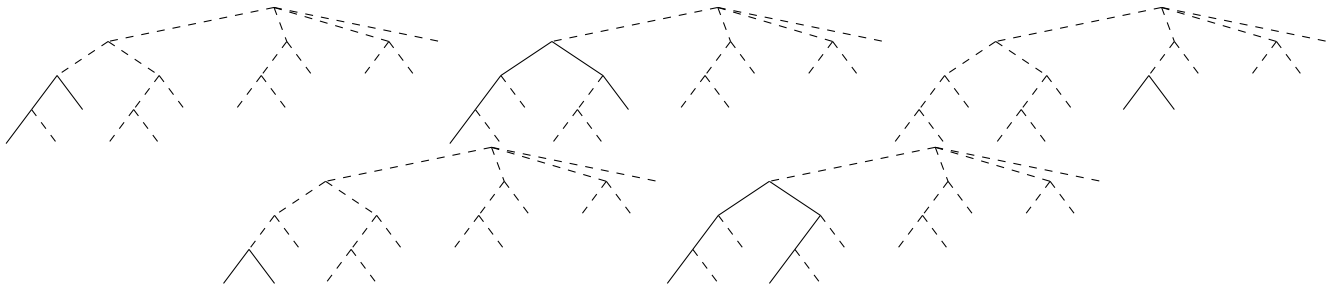
**Topology 410**



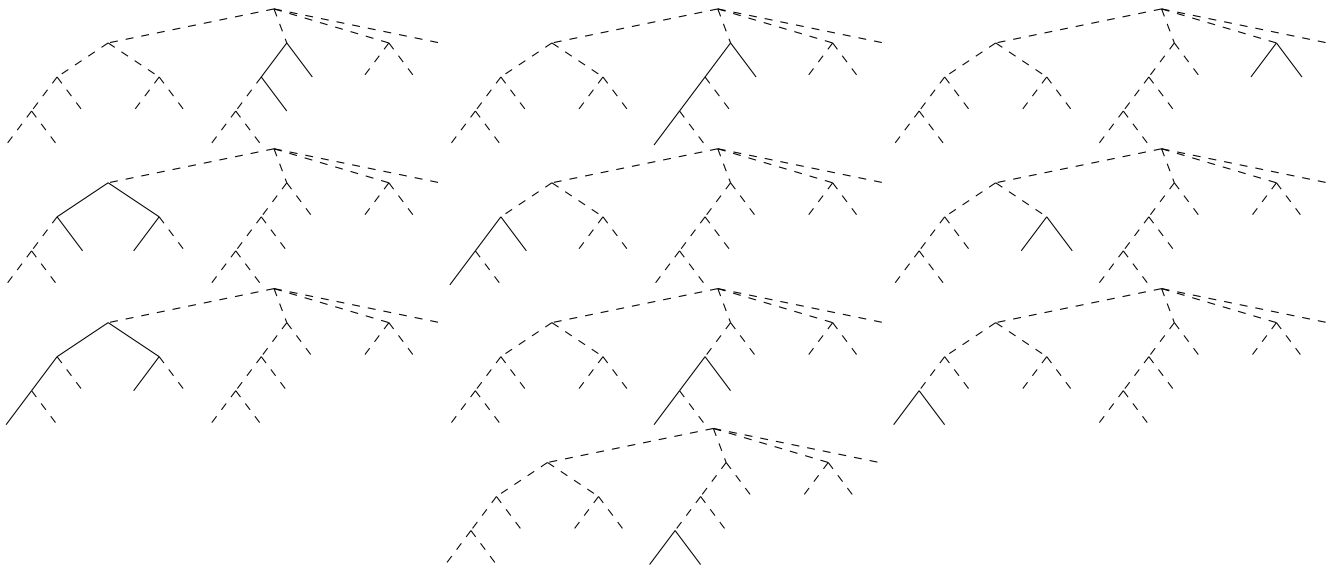
**Topology 411****Topology 412**

**Topology 413****Topology 414****Topology 415**

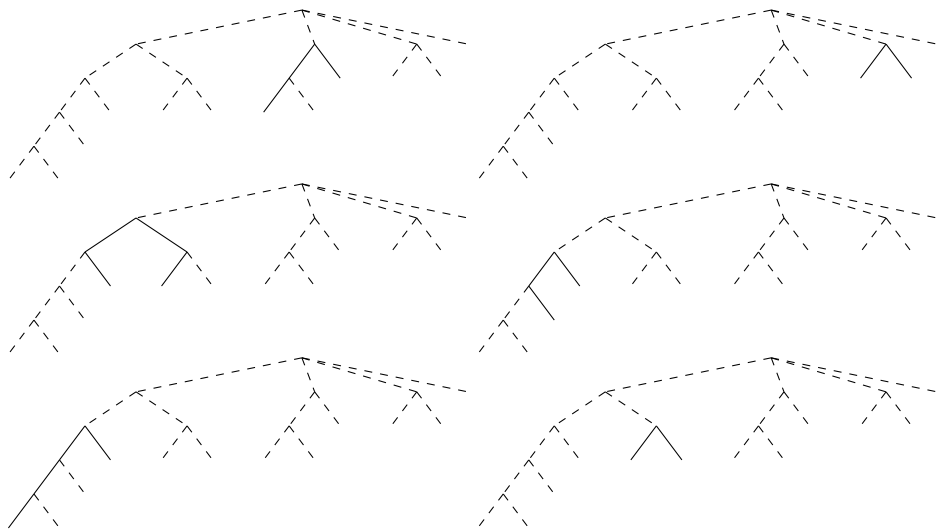
**Topology 416****Topology 417****Topology 418**

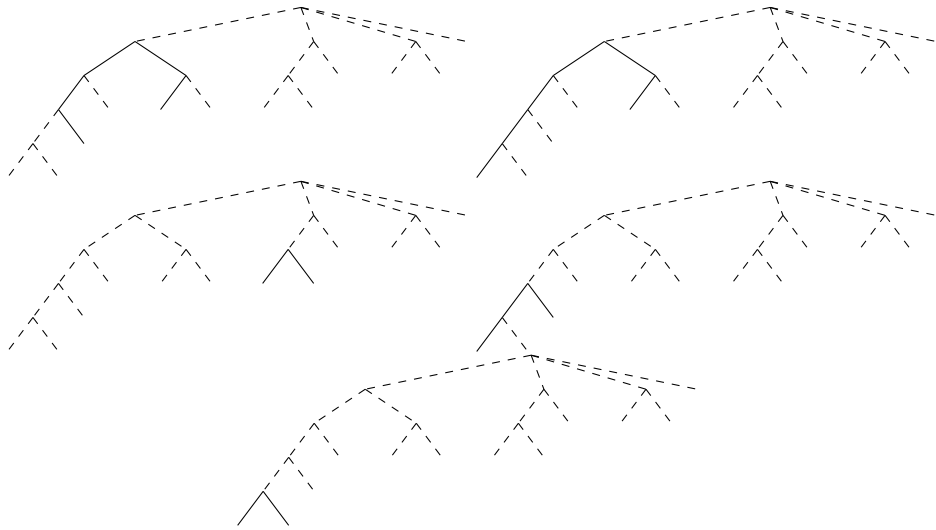
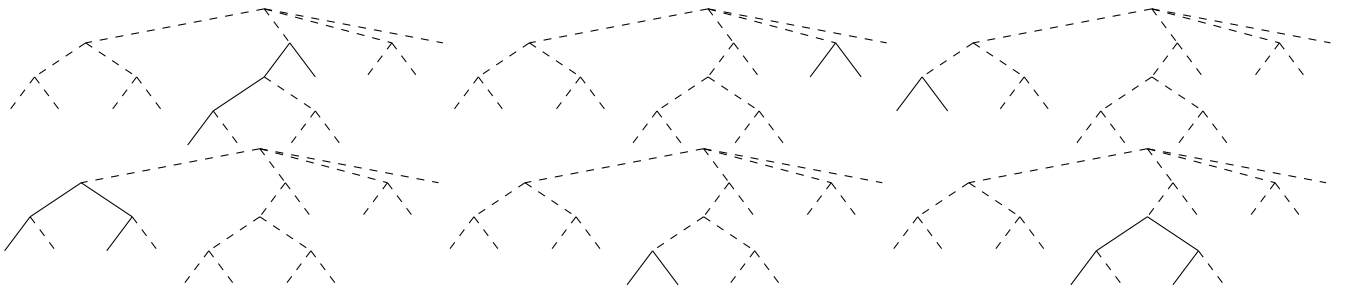
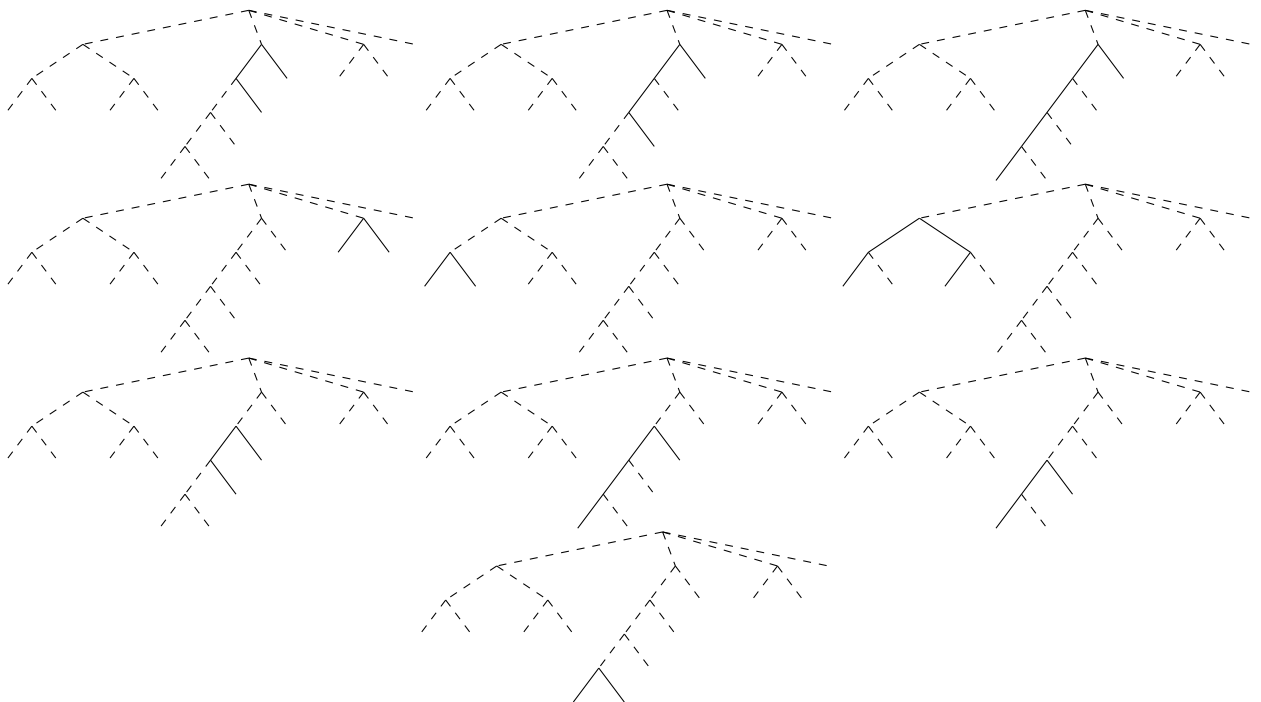


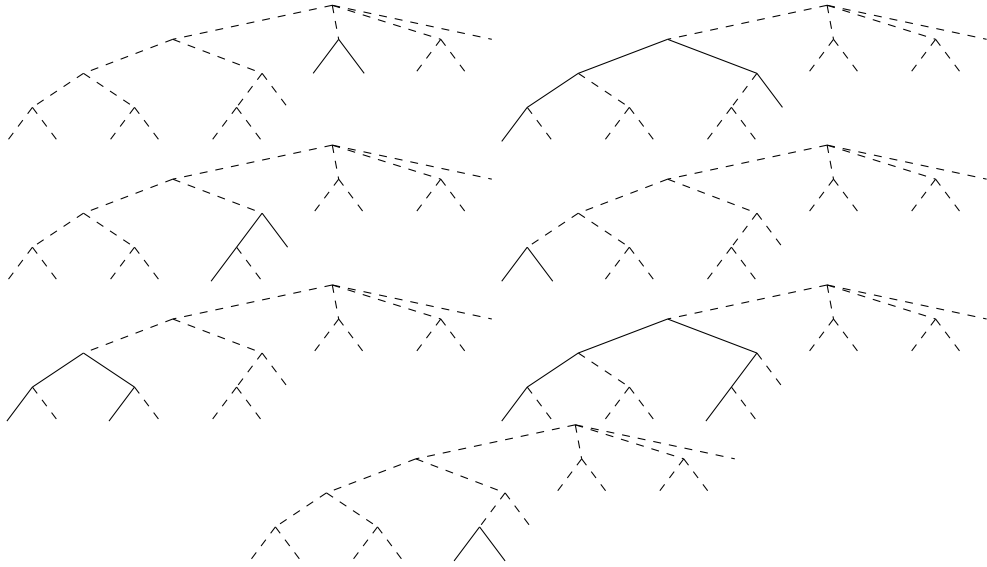
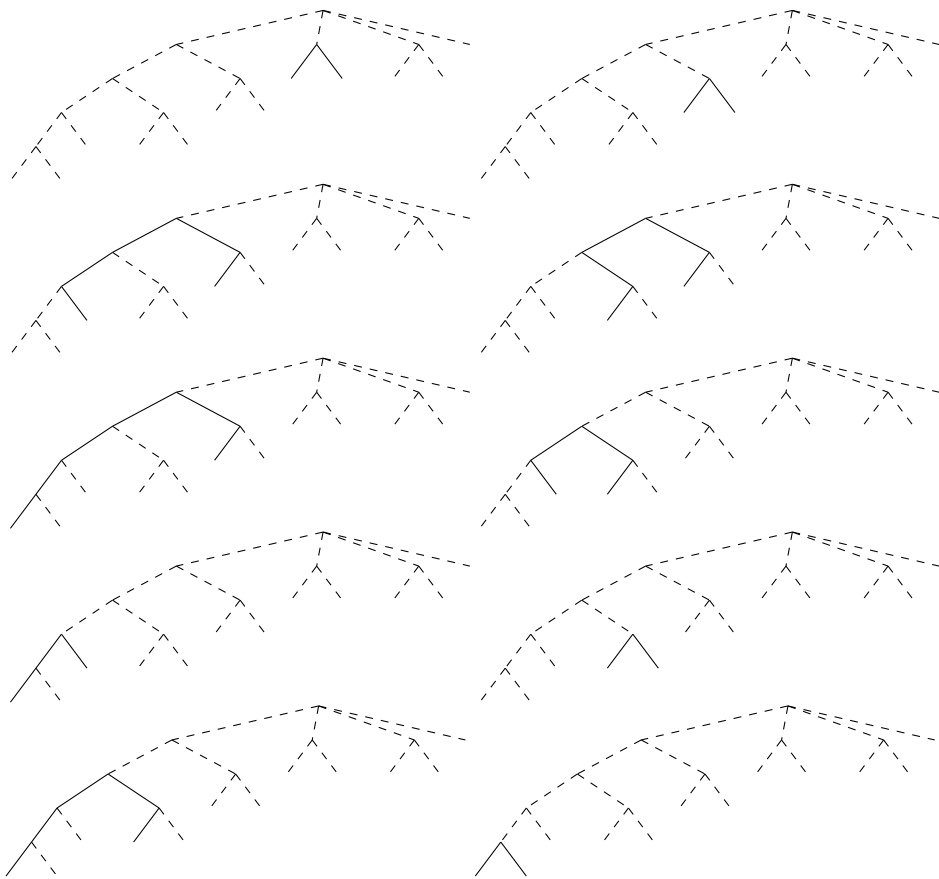
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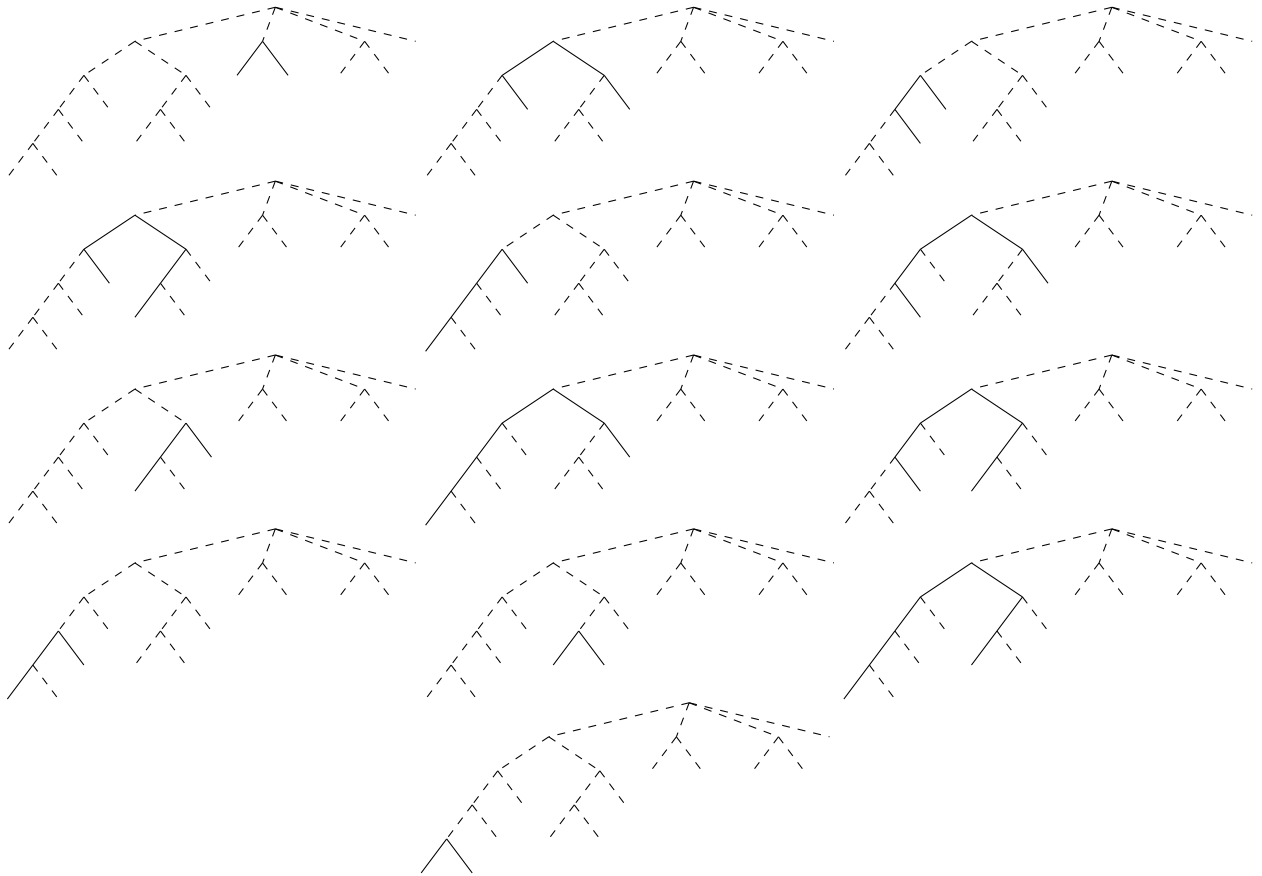
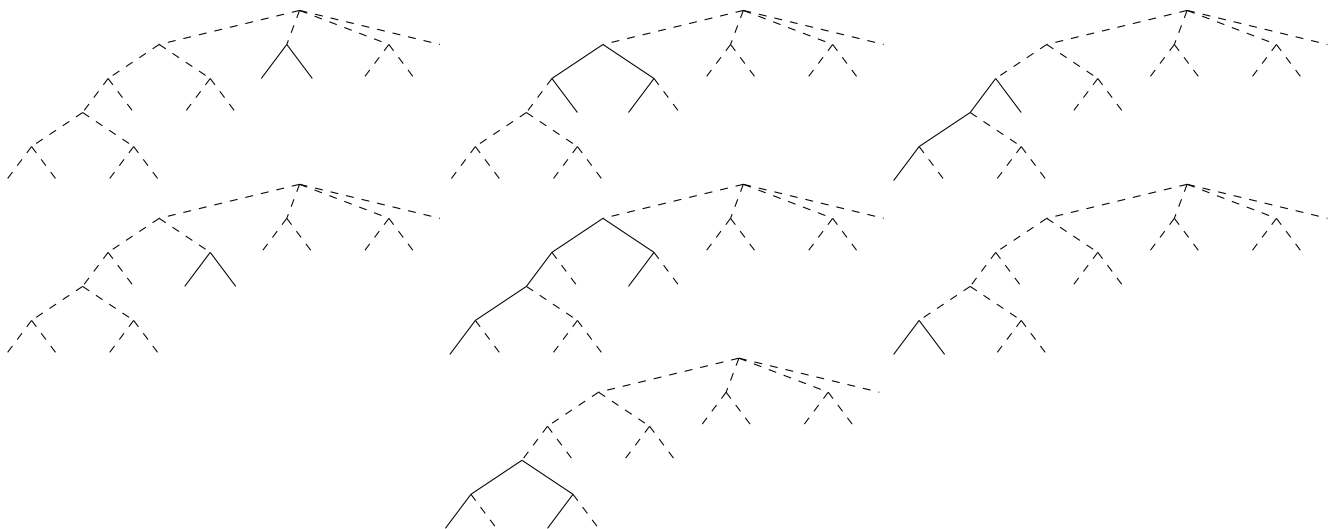


**Topology 420**

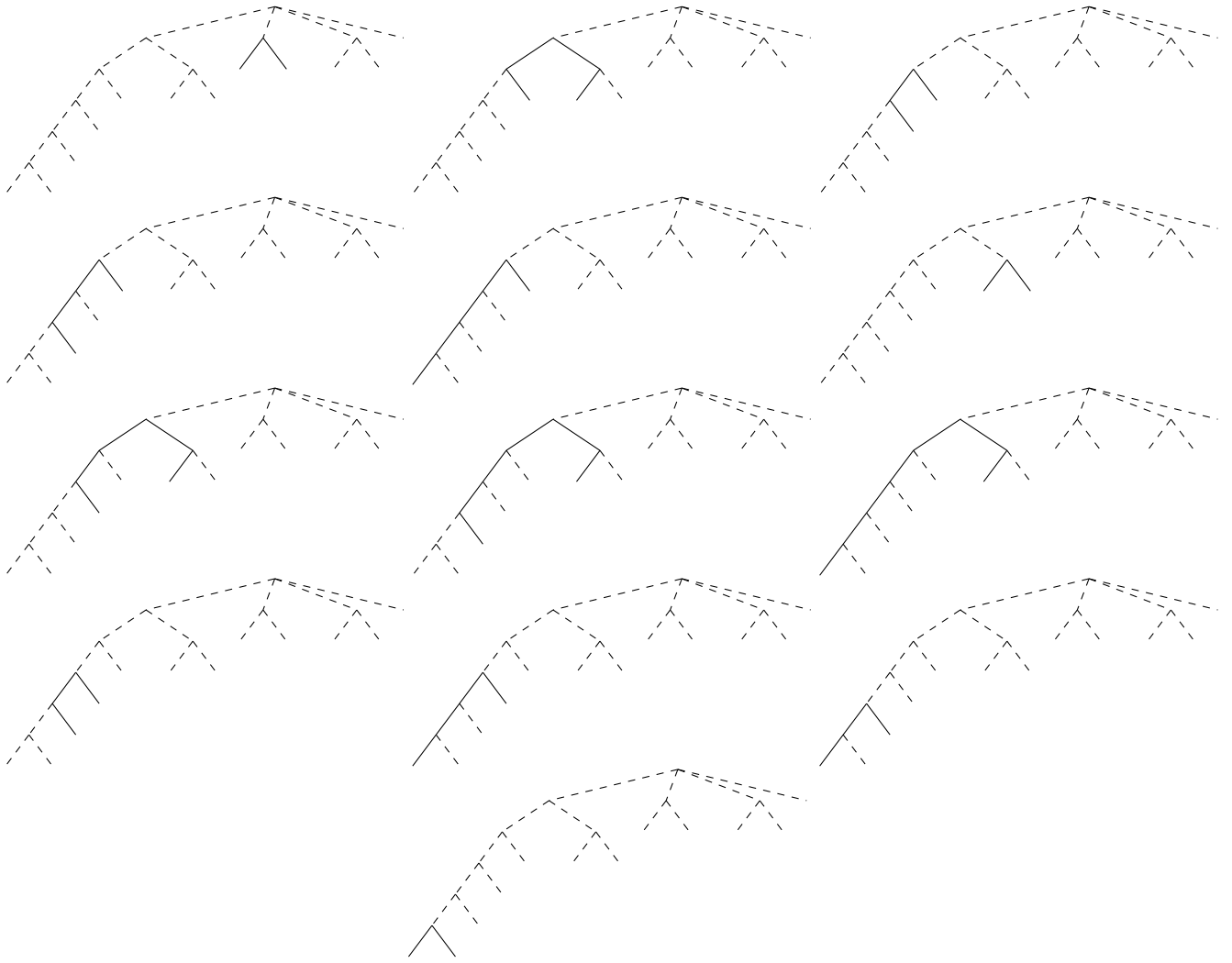
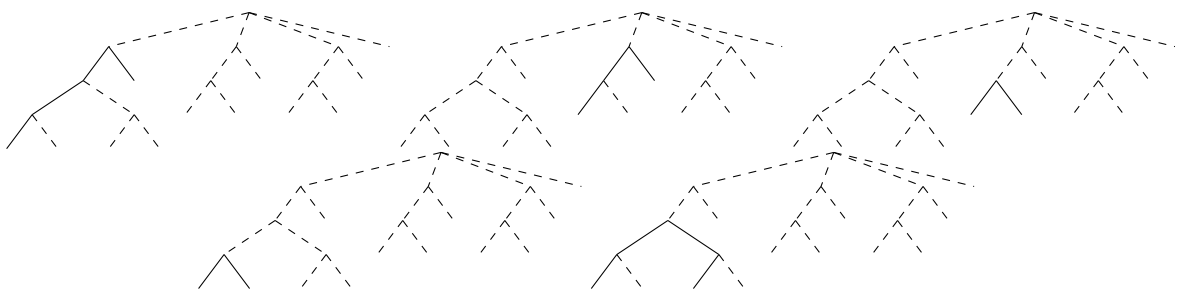


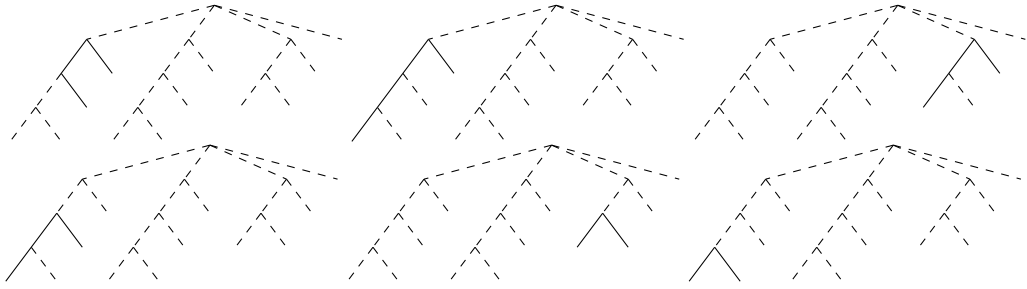
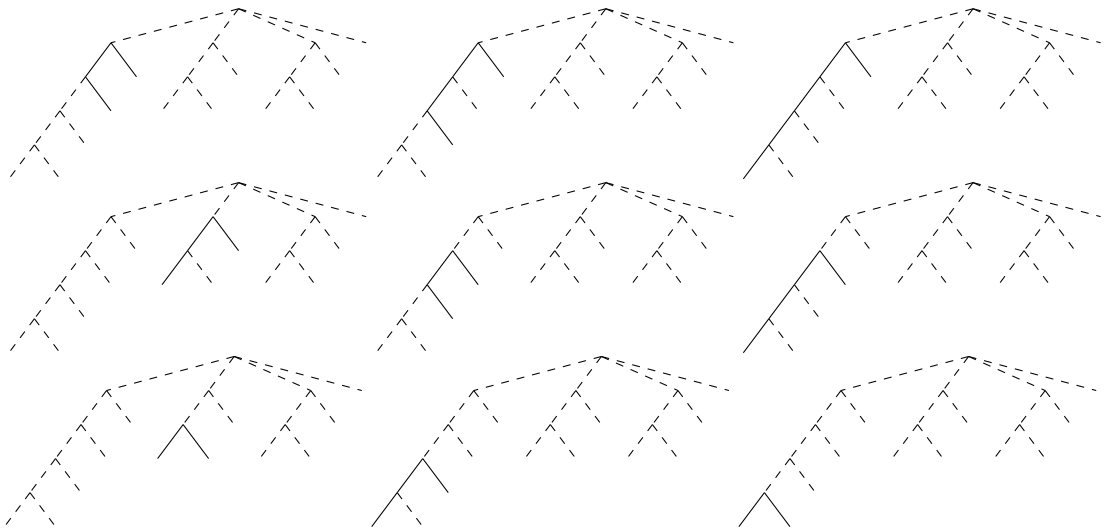
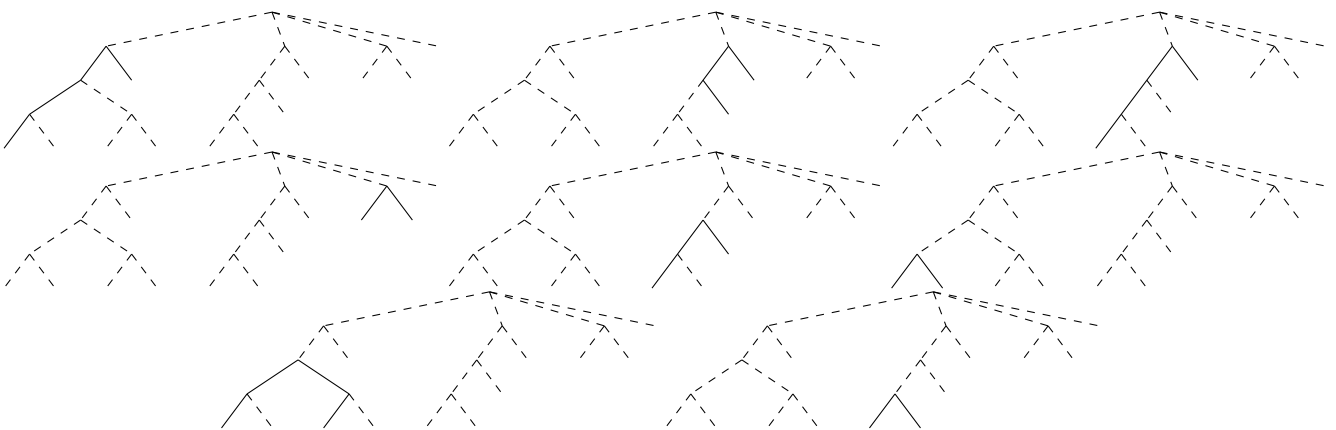
**Topology 421****Topology 422**

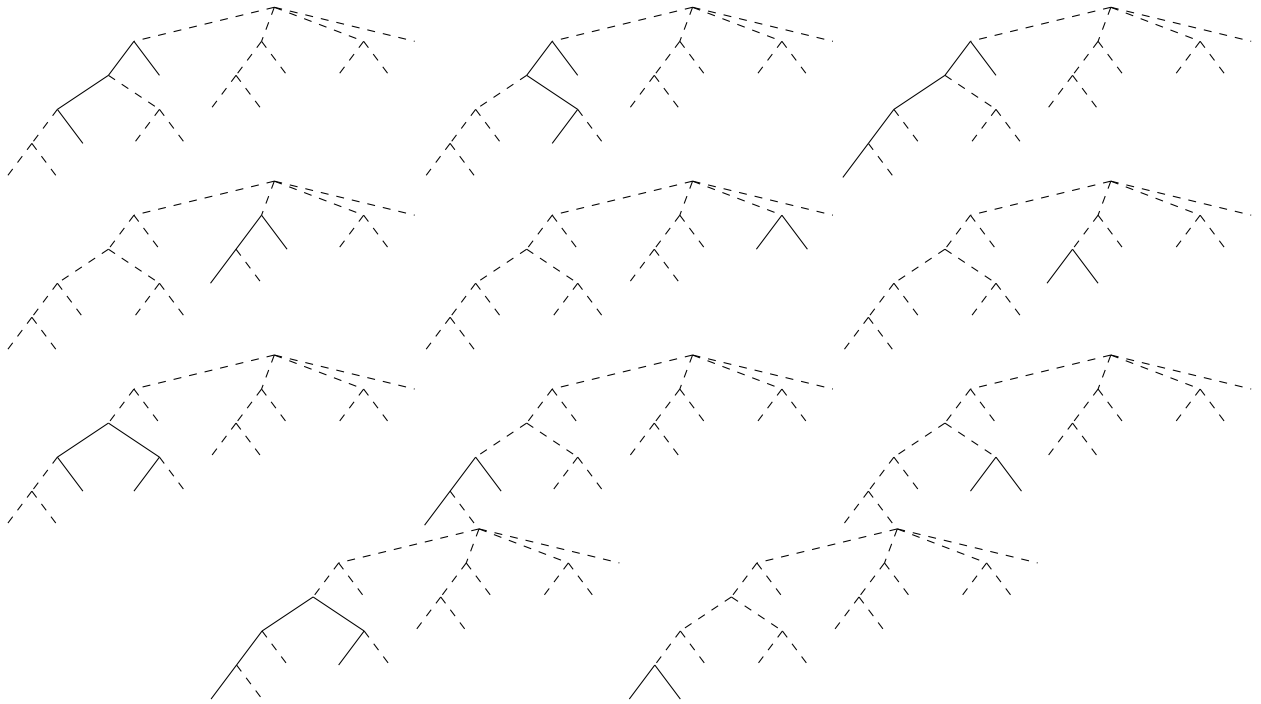
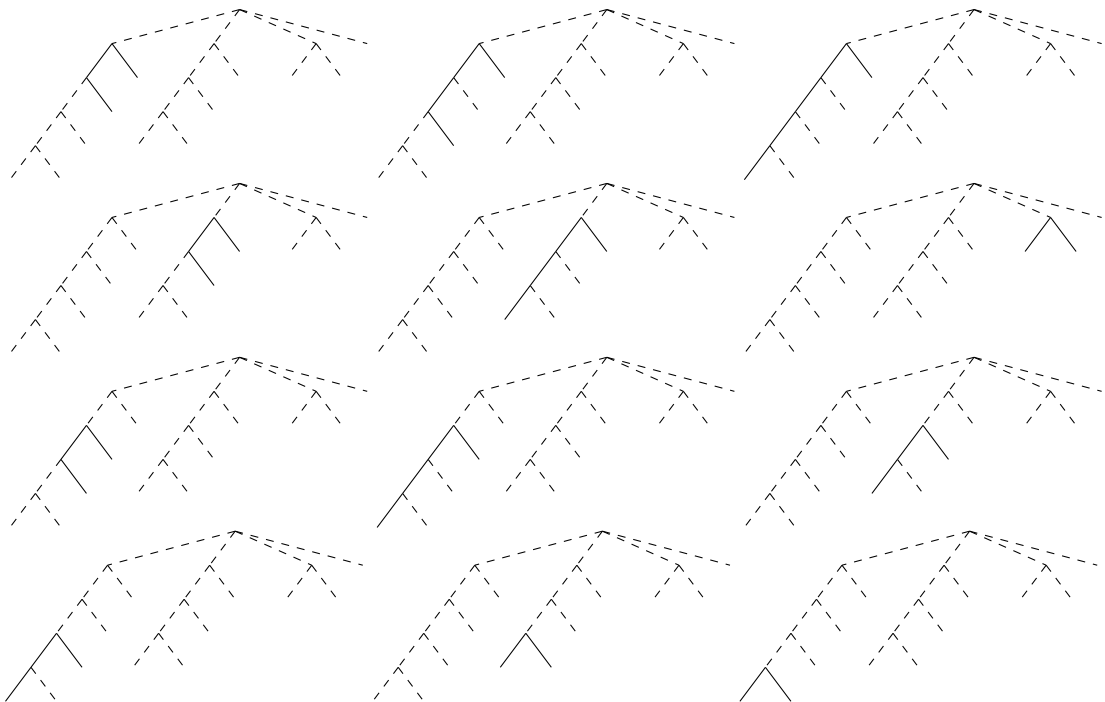
**Topology 423****Topology 424**

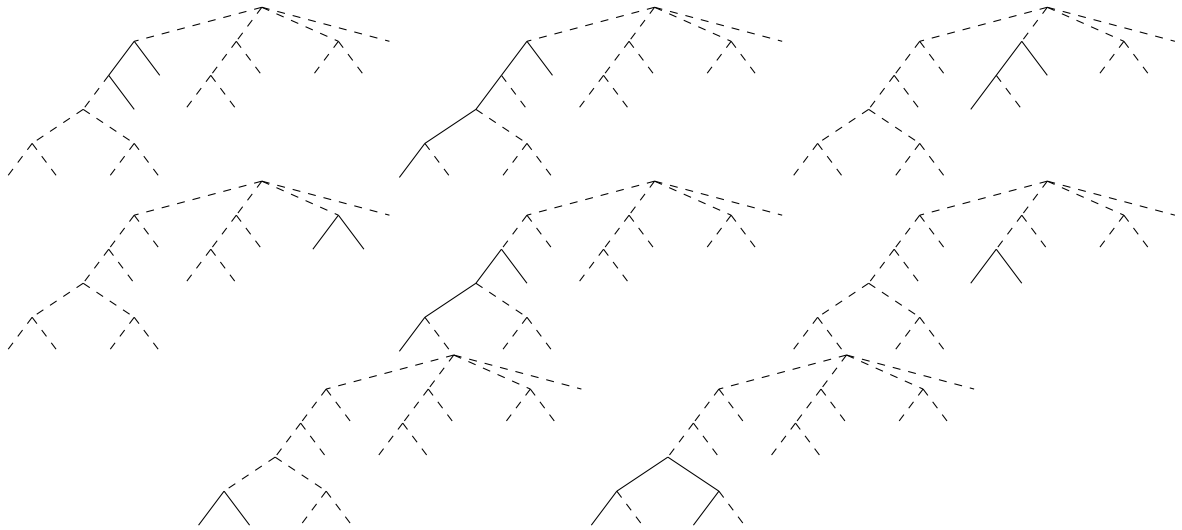
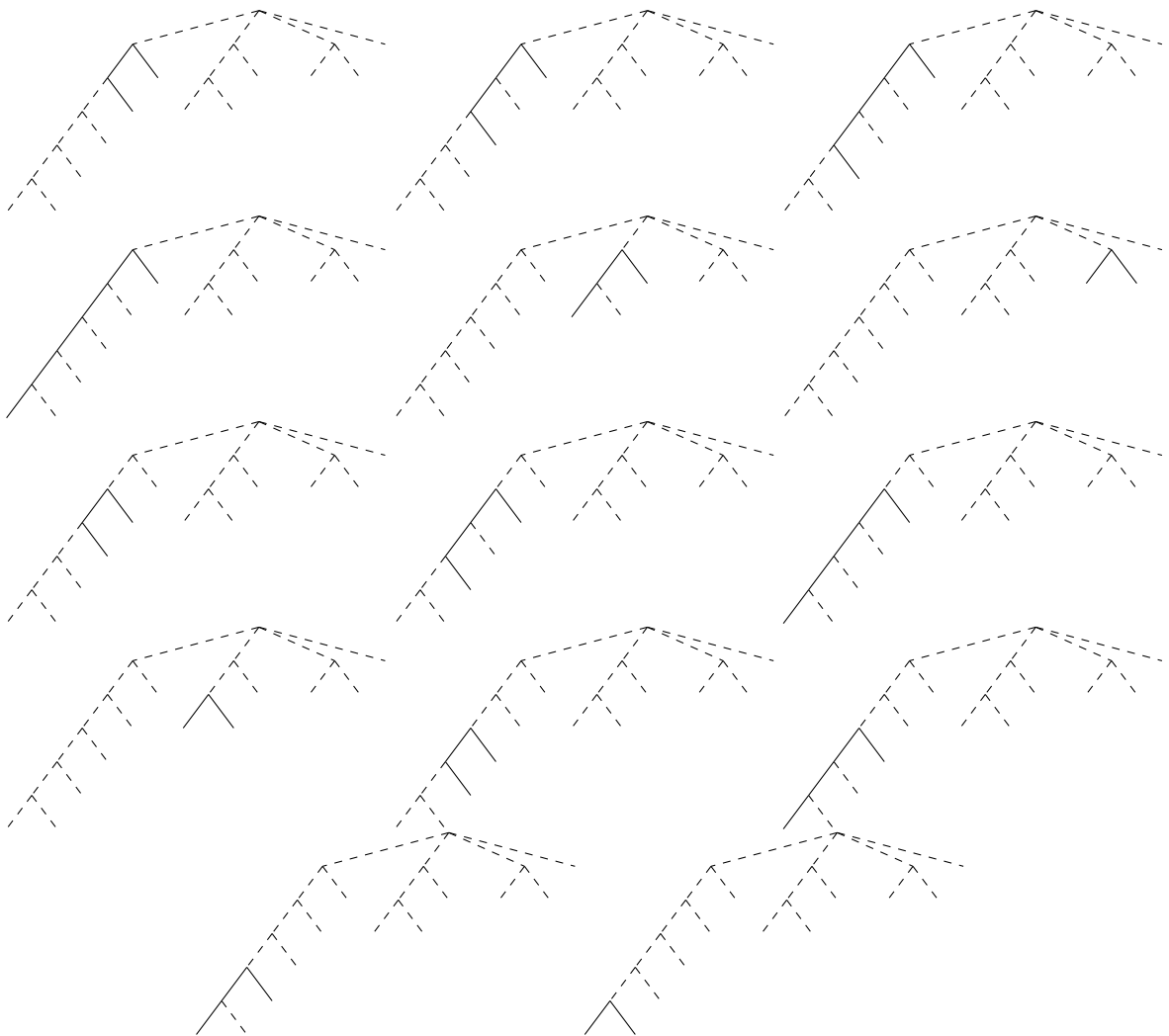
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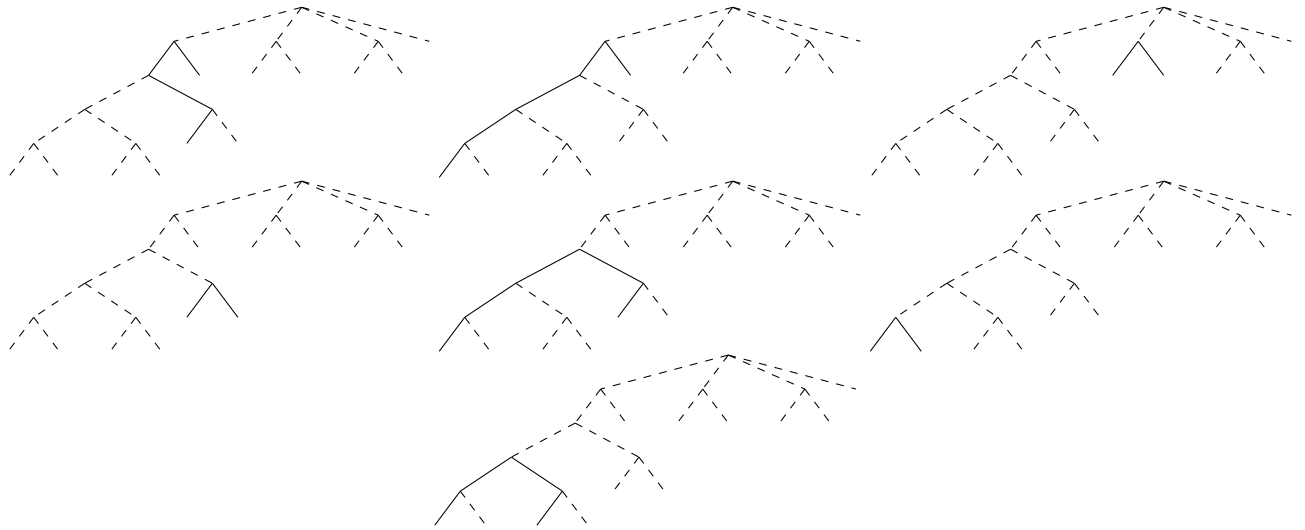
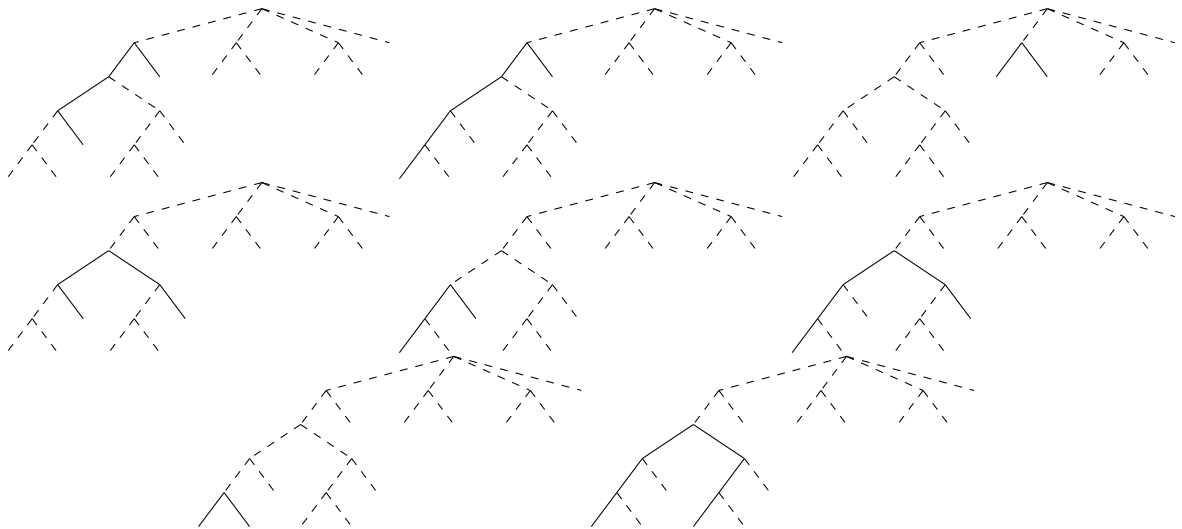
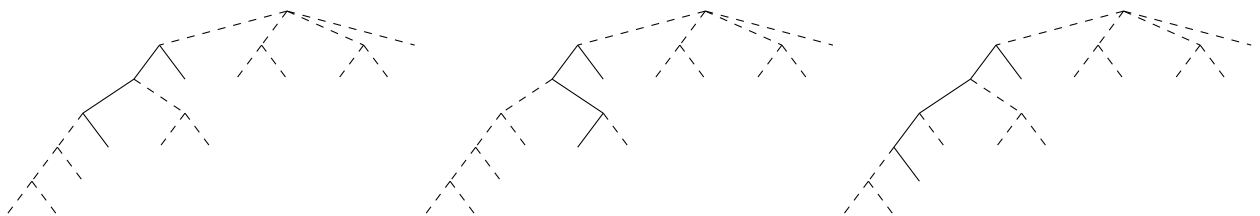


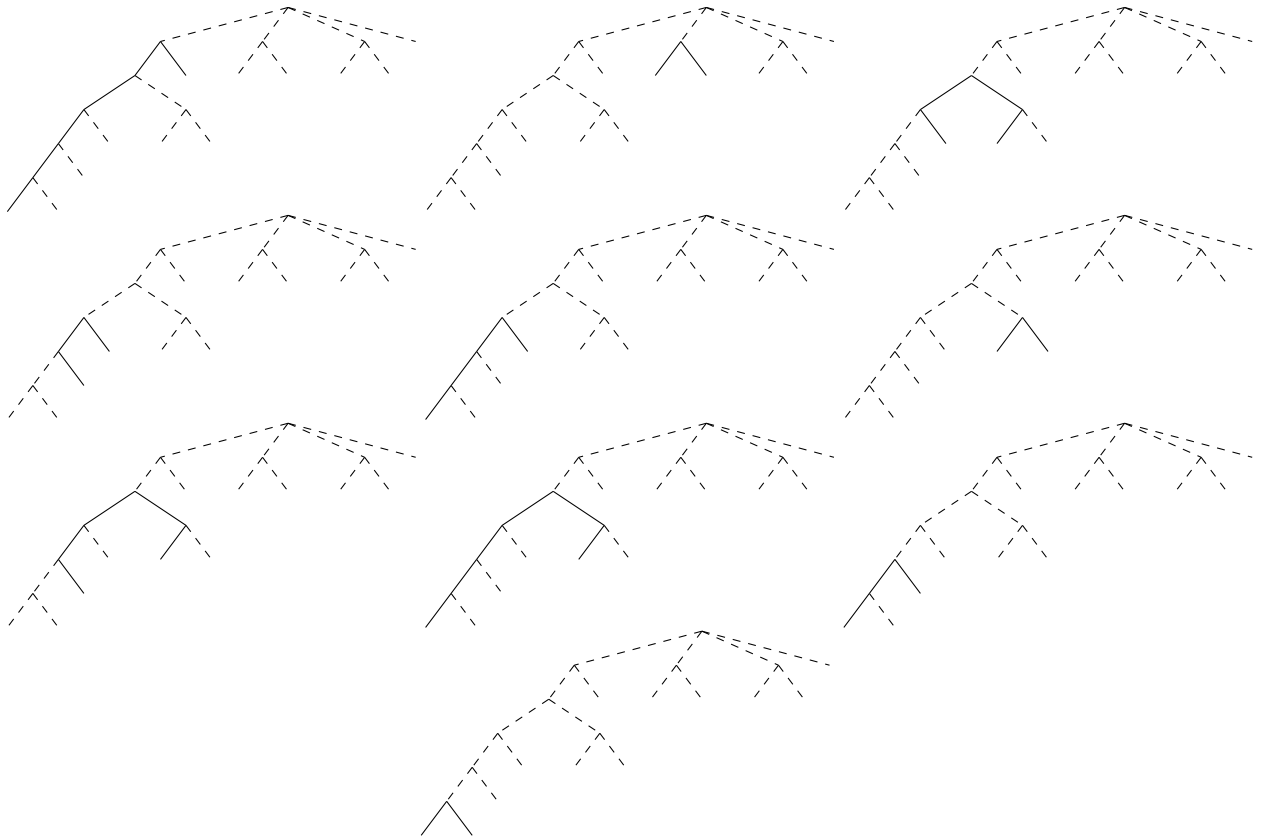
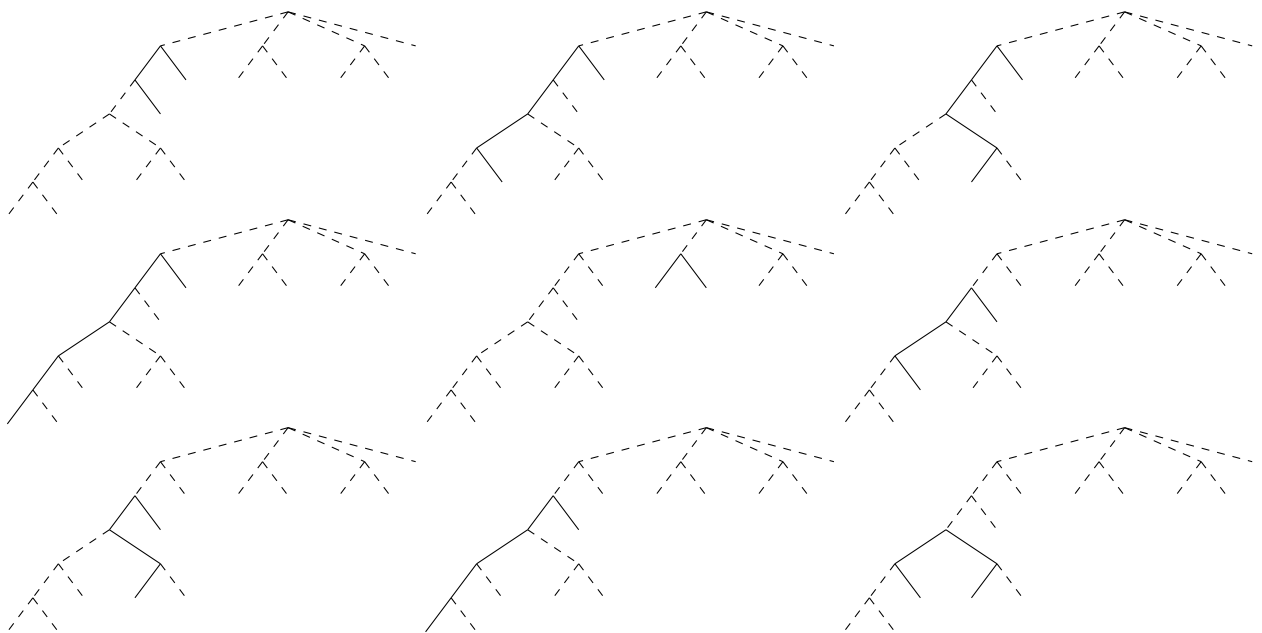
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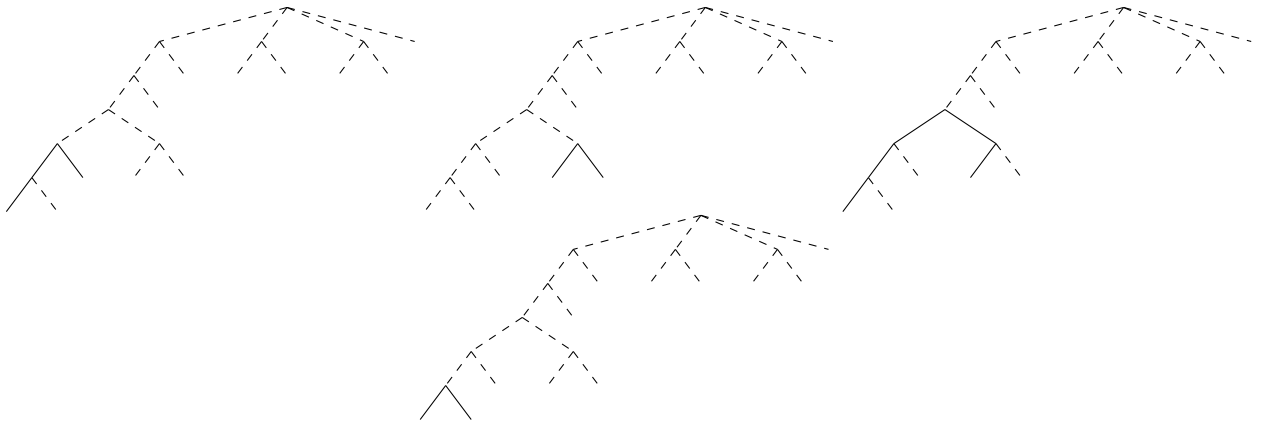
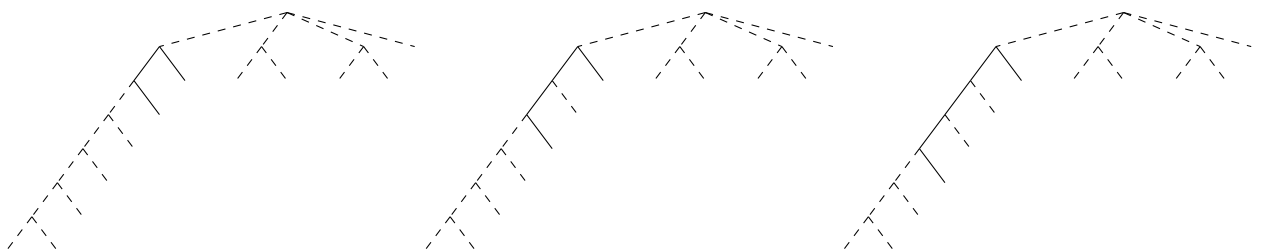
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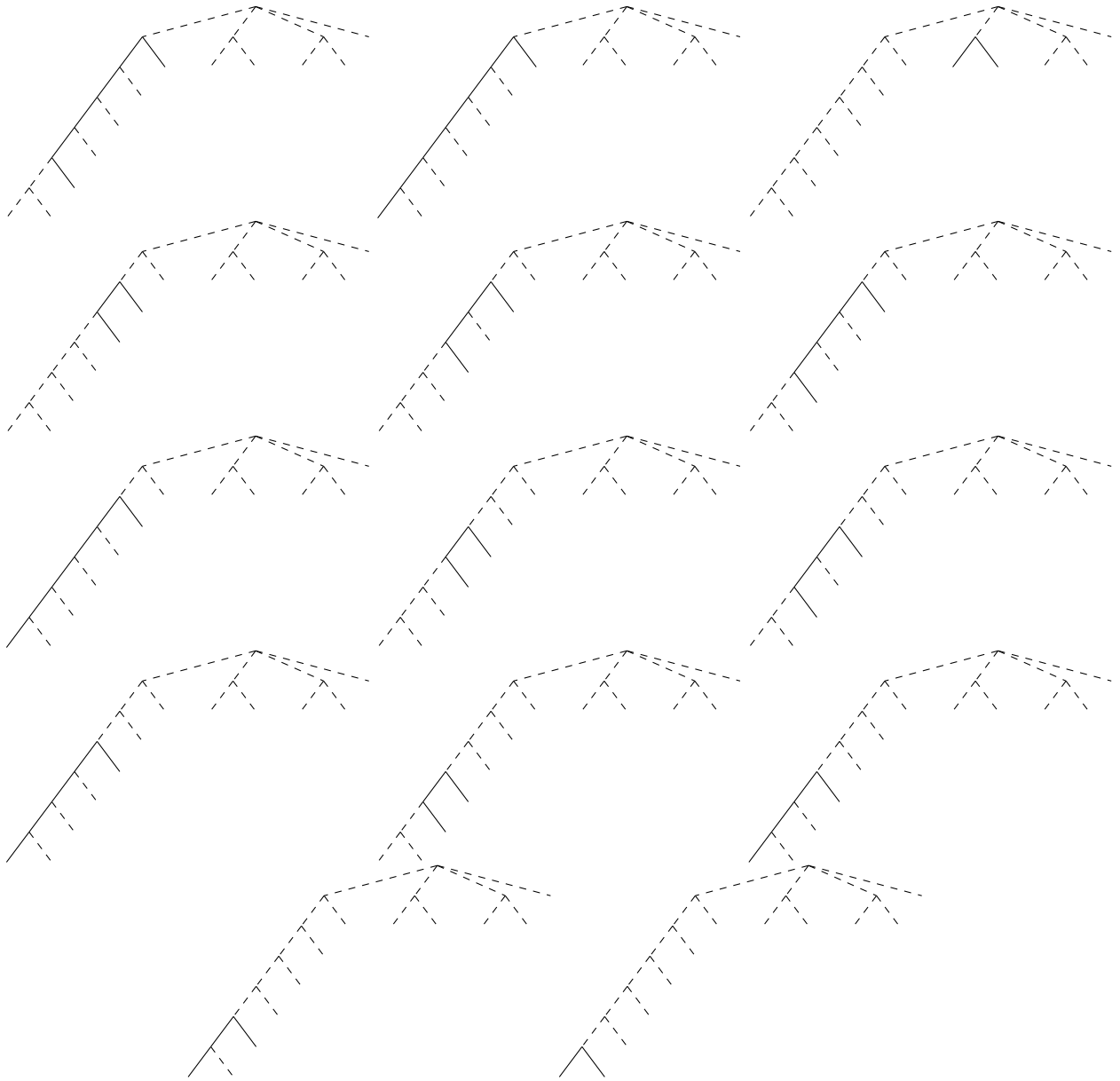
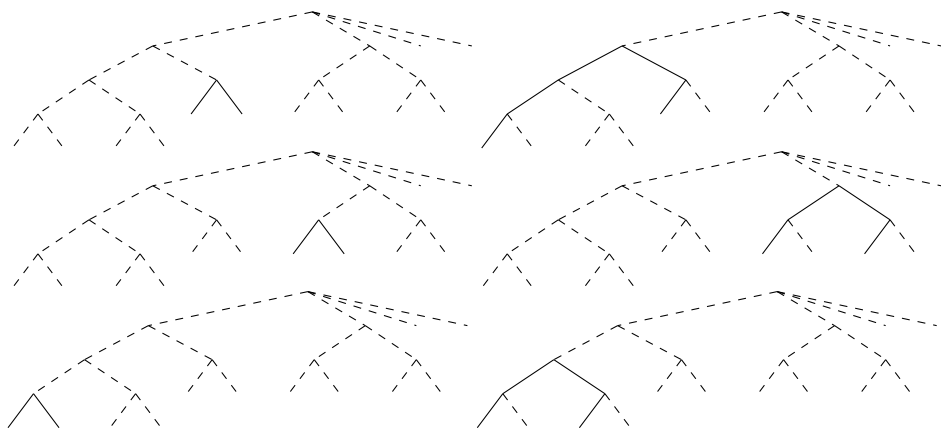
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**Topology 434****Topology 435**

**Topology 436****Topology 437****Topology 438**

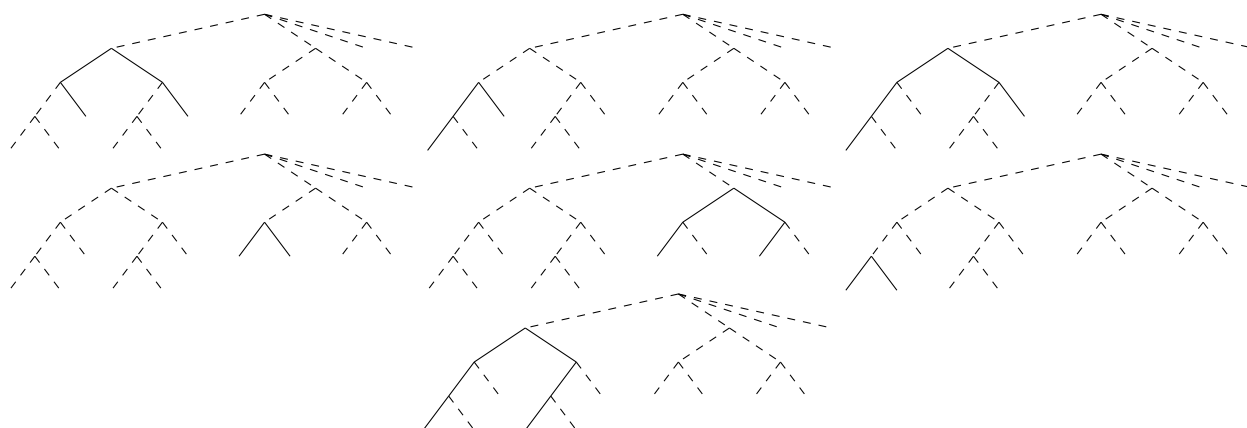
**Topology 439**

**Topology 440****Topology 441**

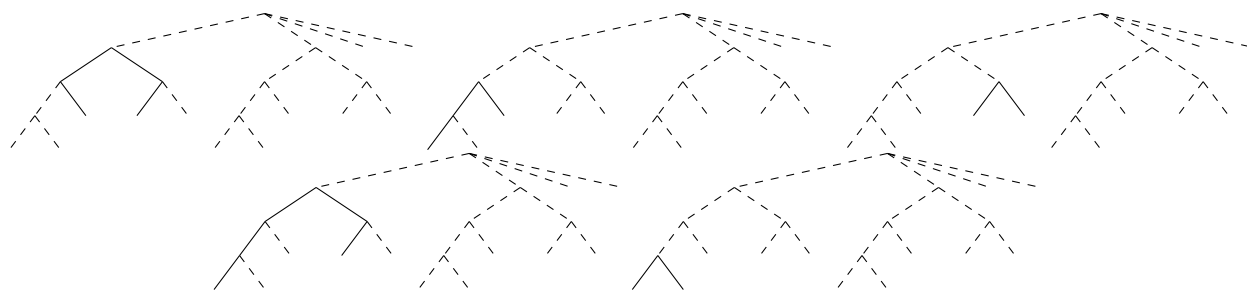
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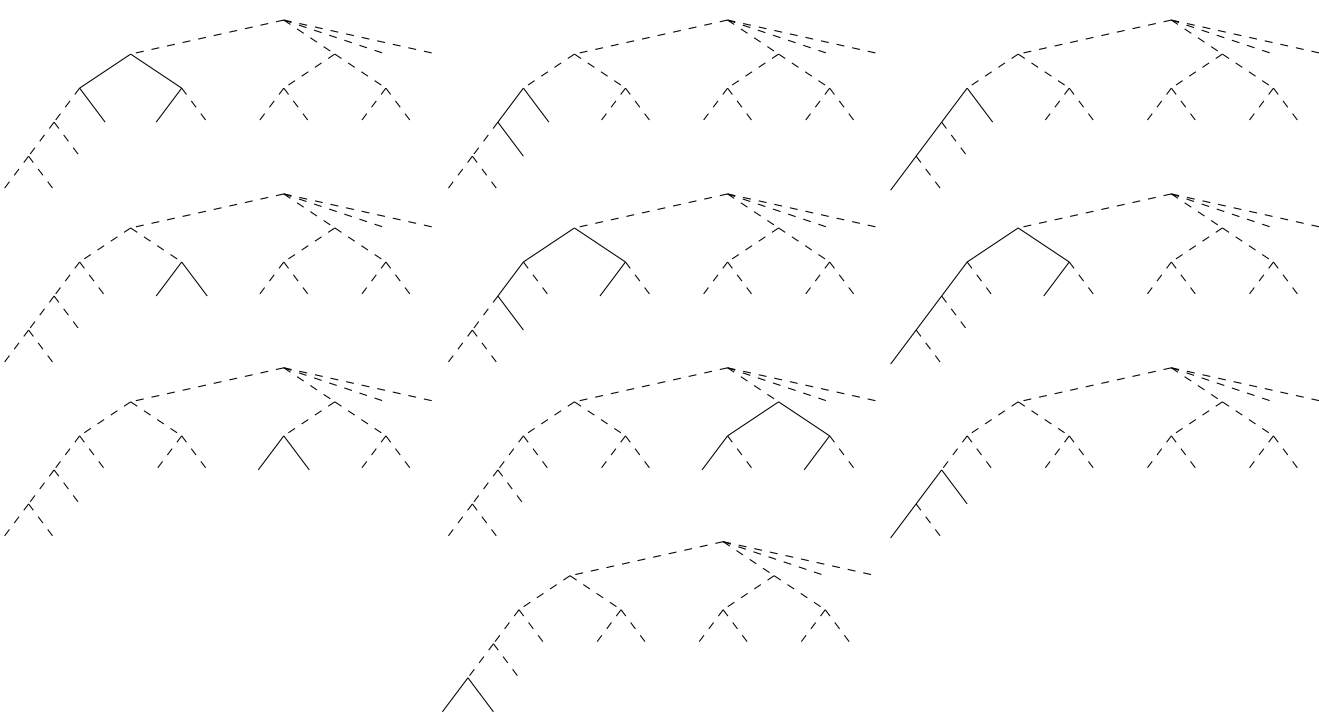
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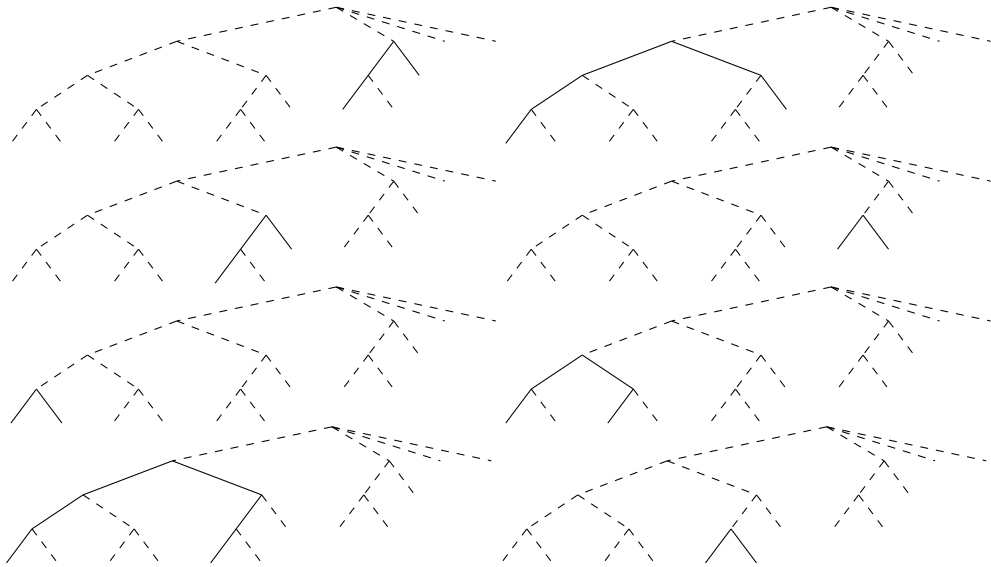
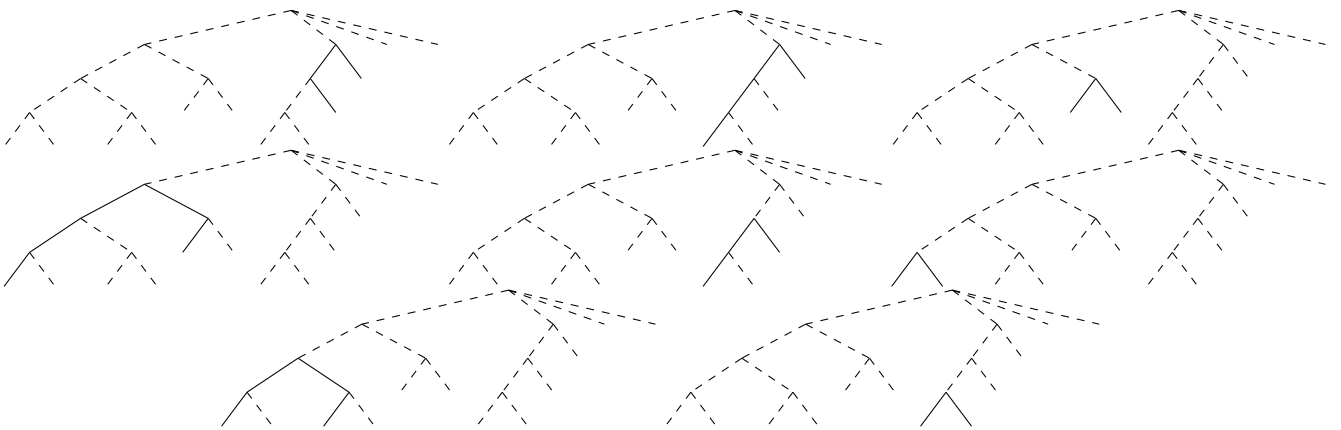
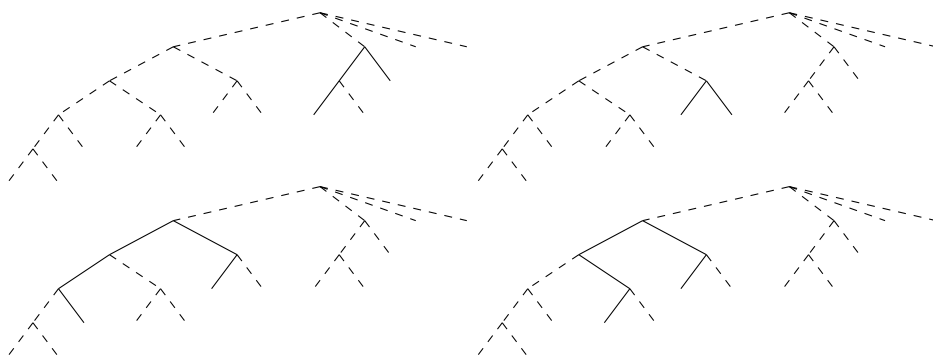


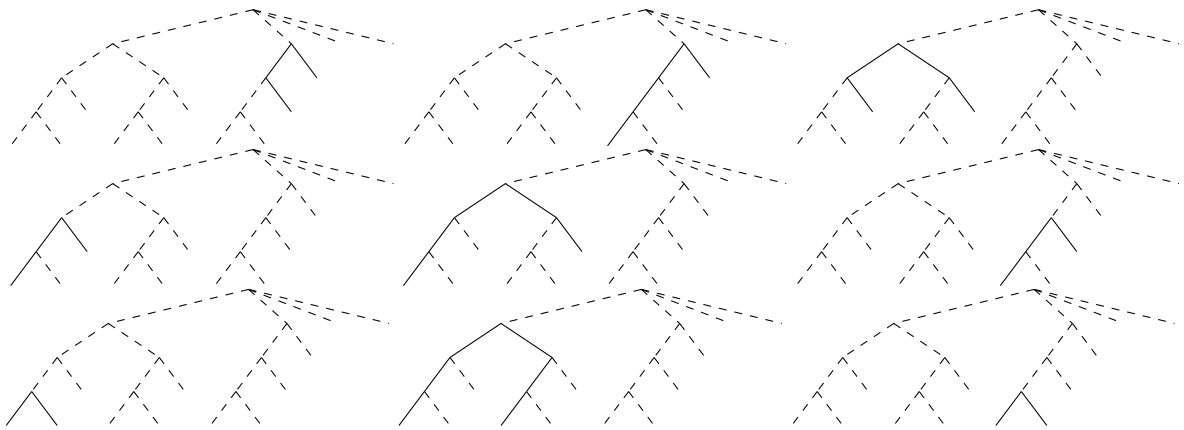
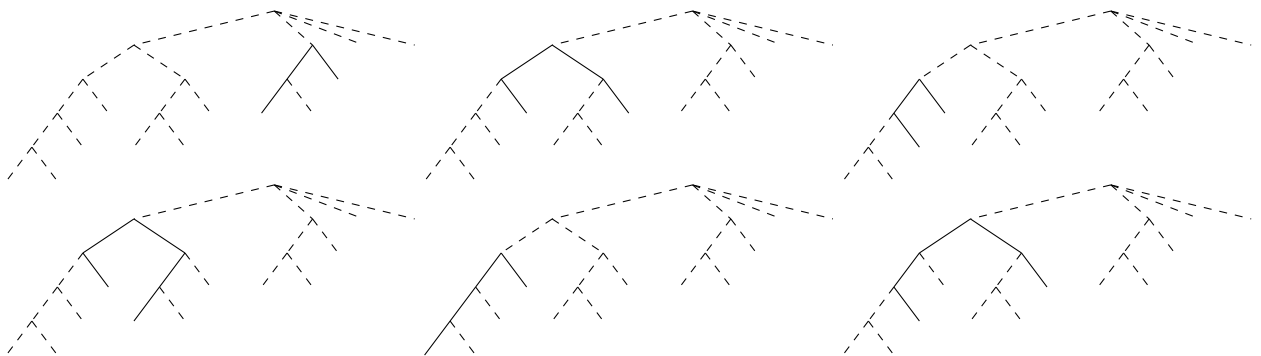
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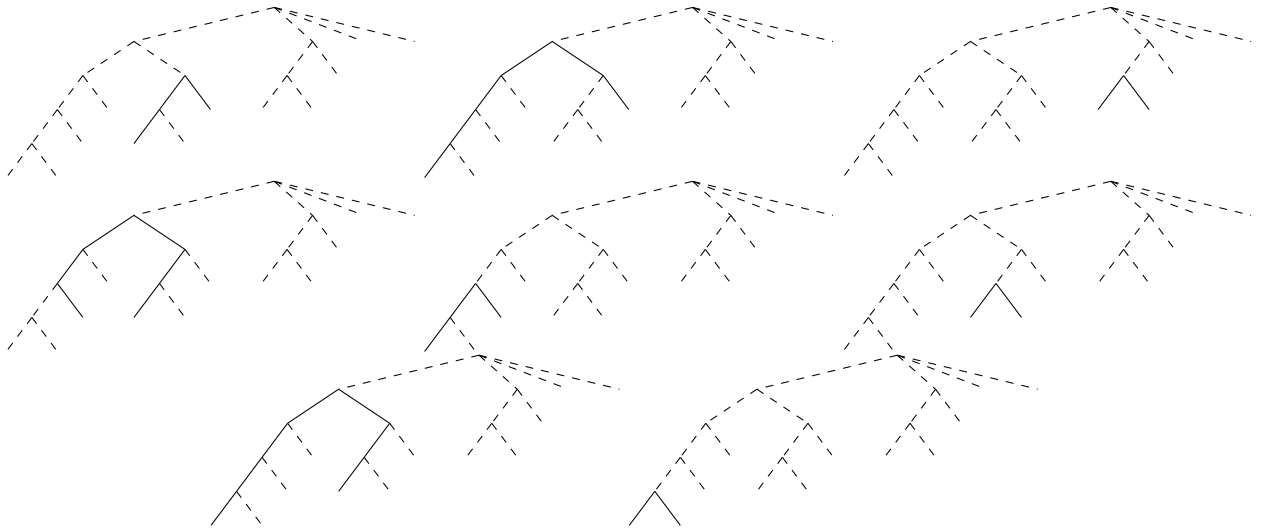
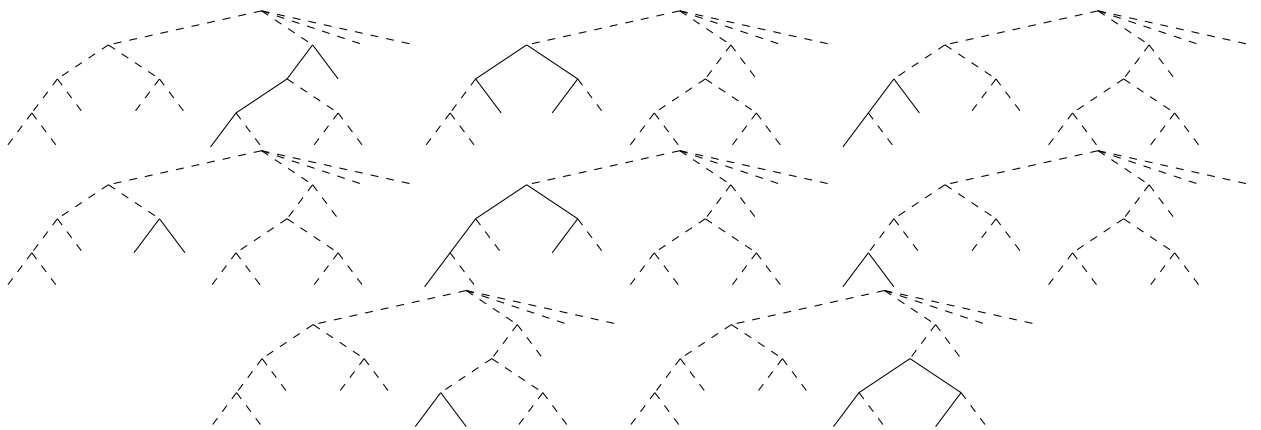
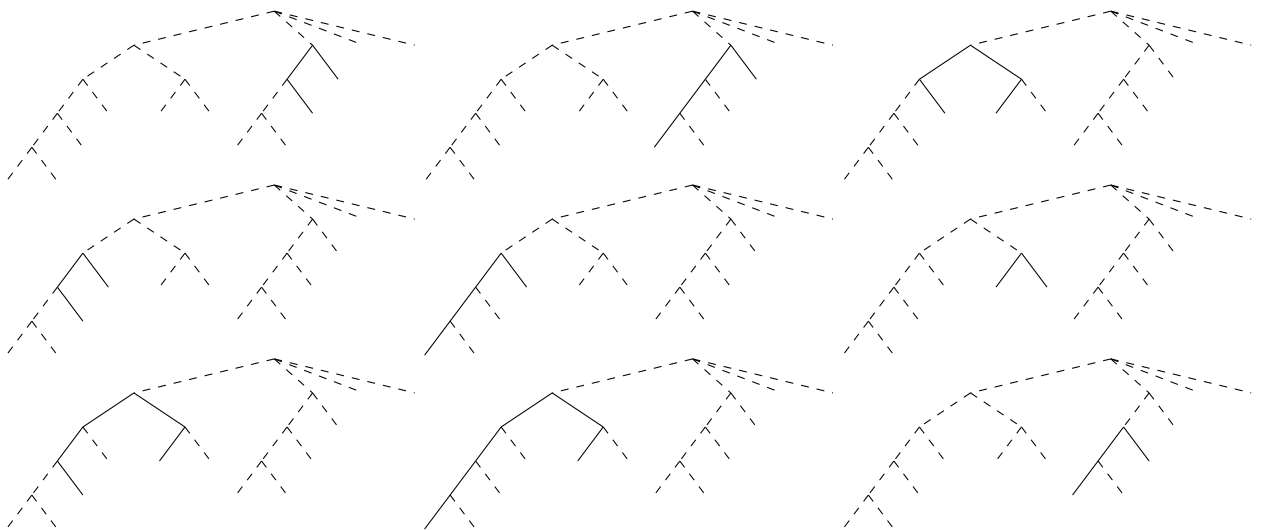


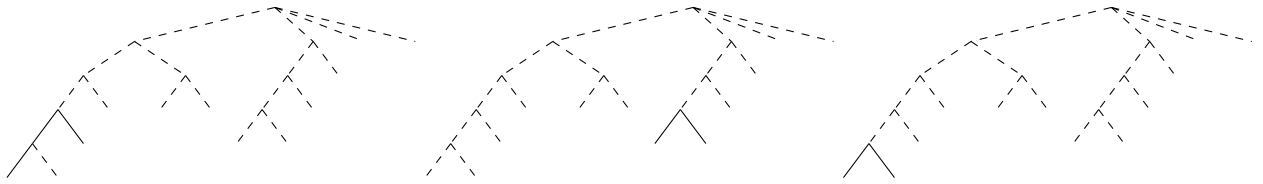
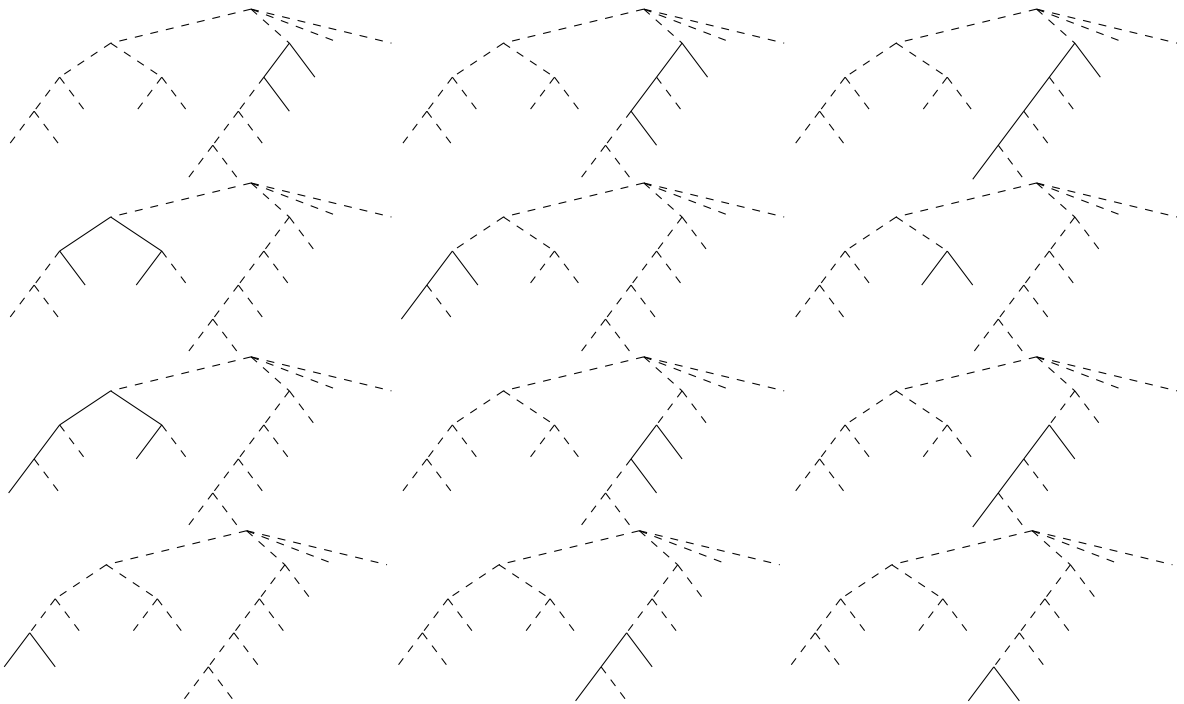
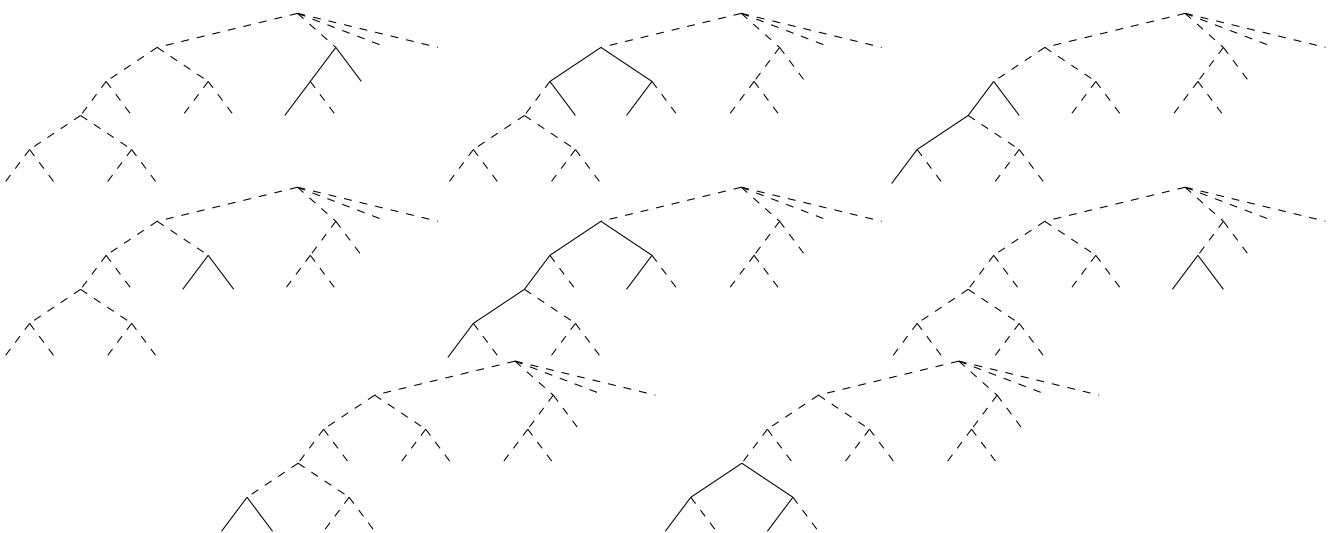
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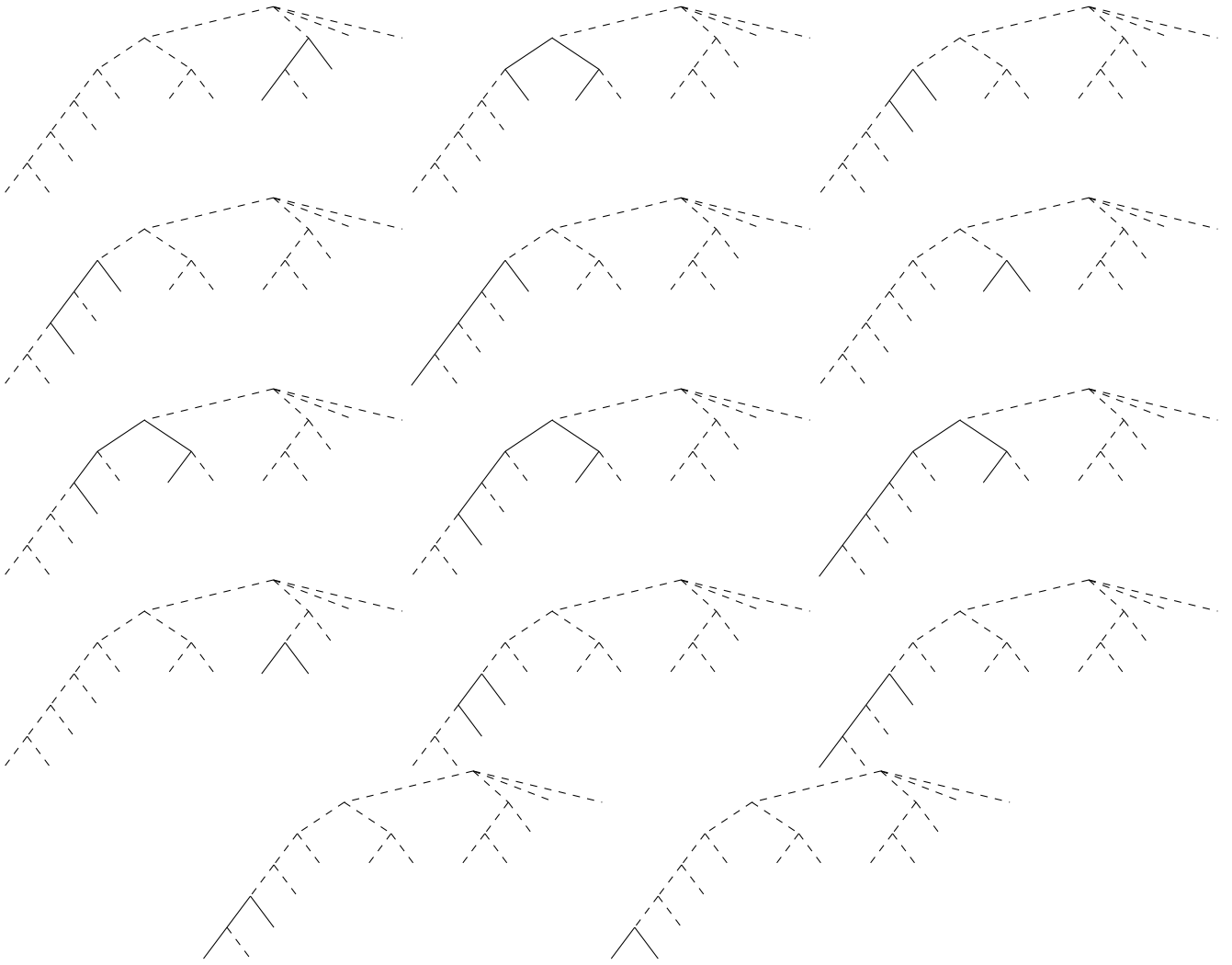
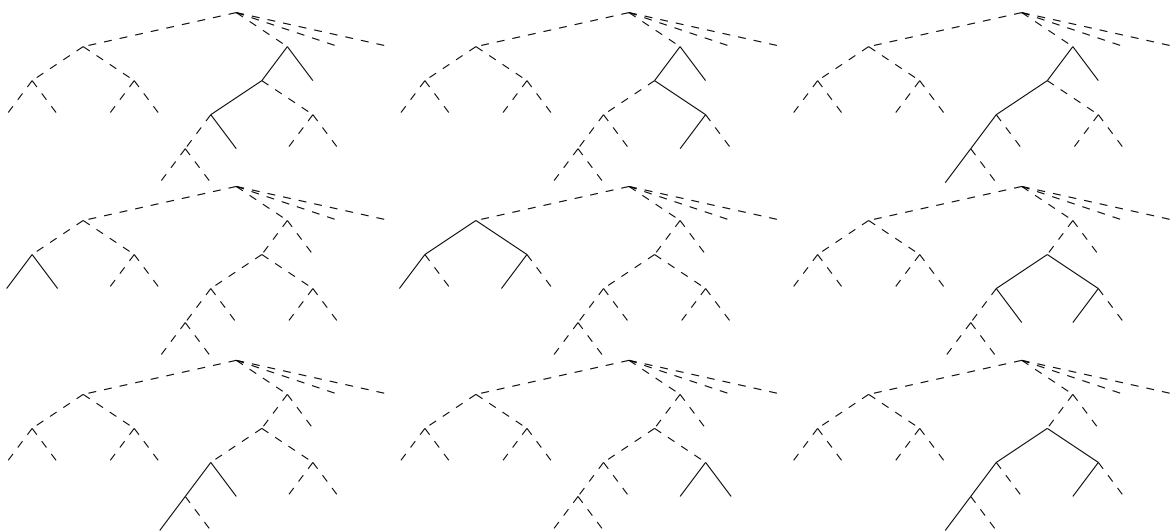


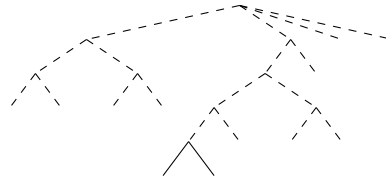
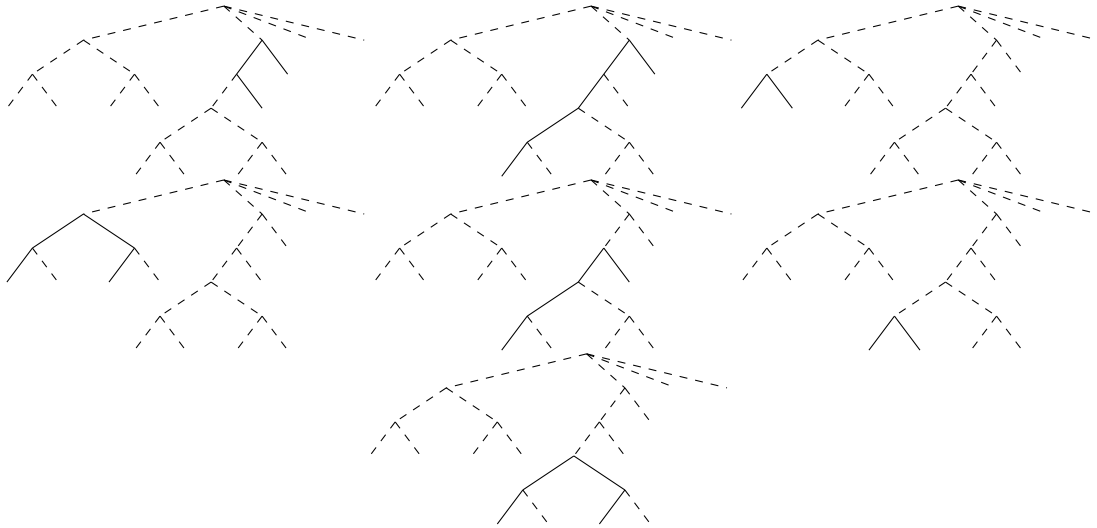
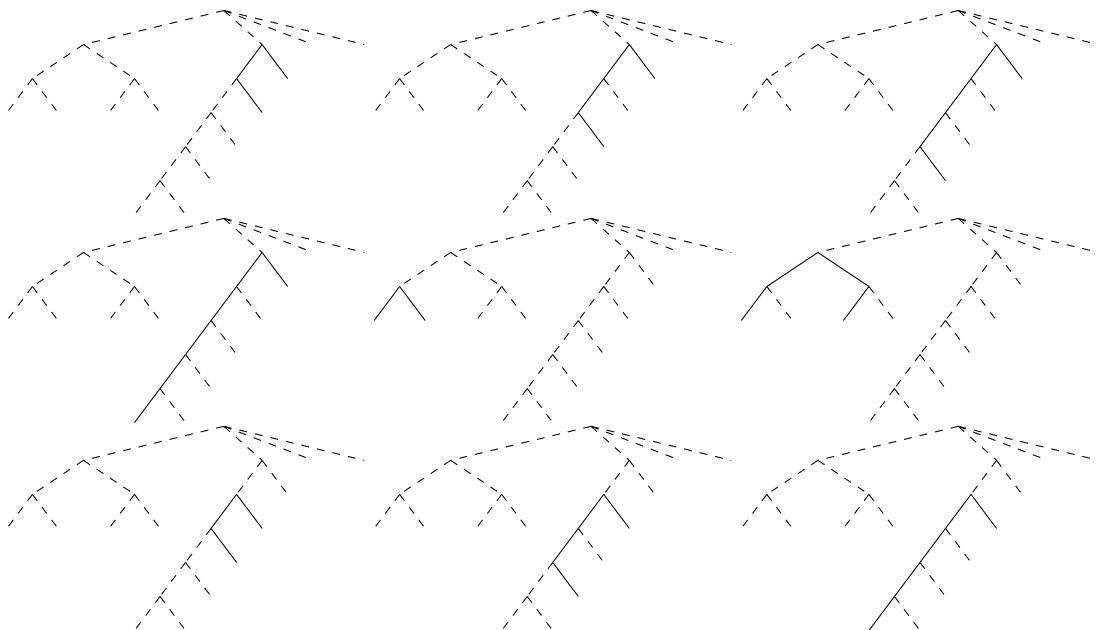
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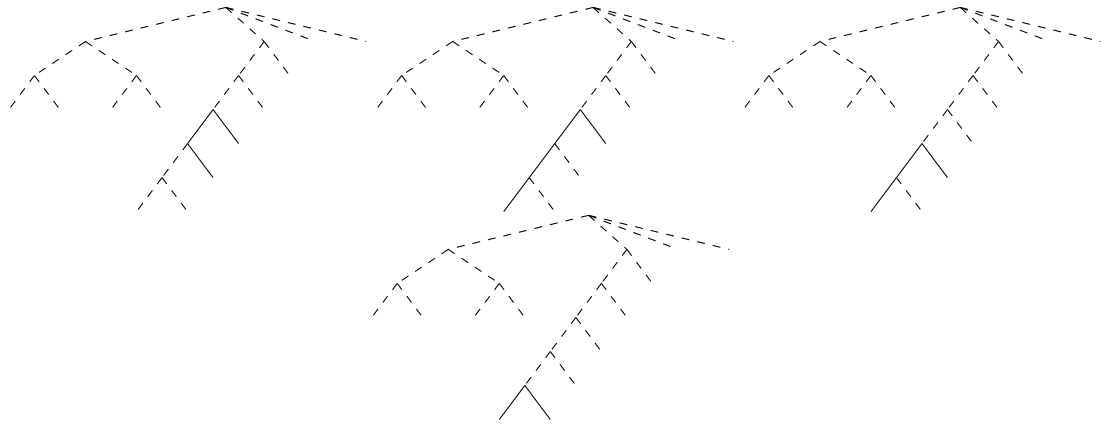
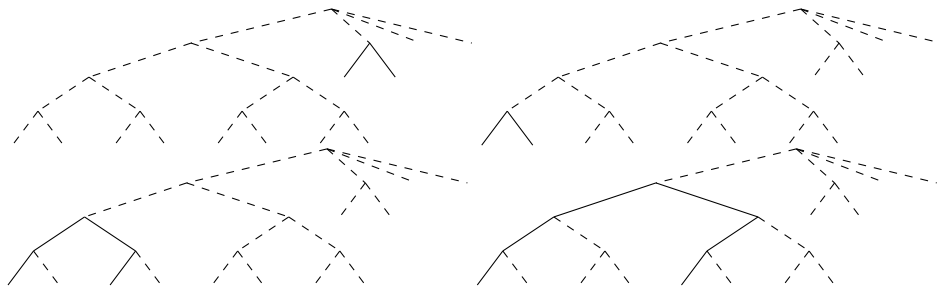
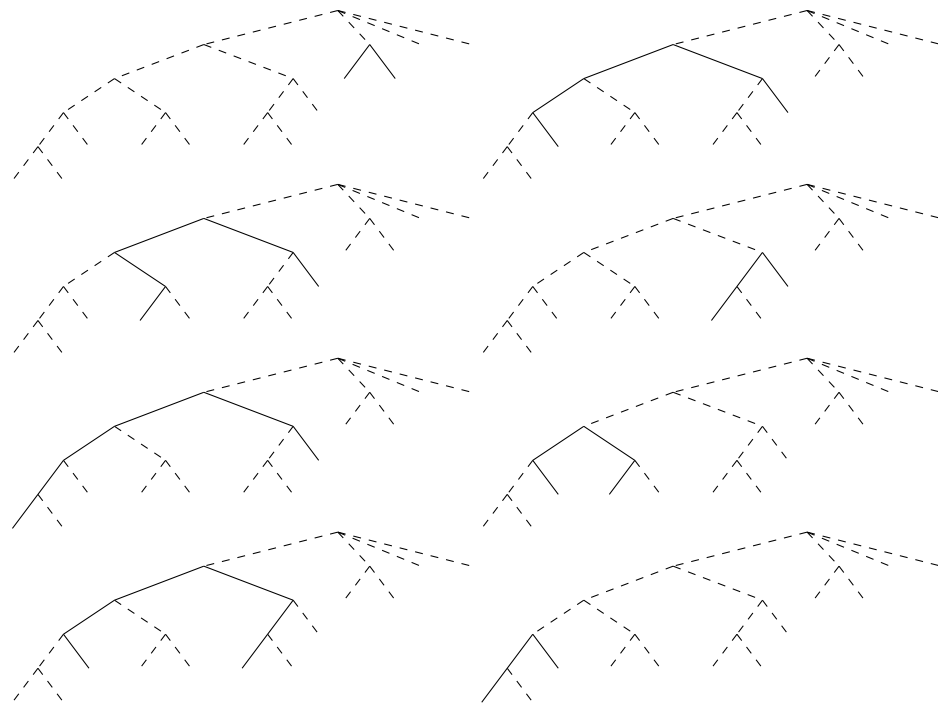
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**Topology 451****Topology 452**

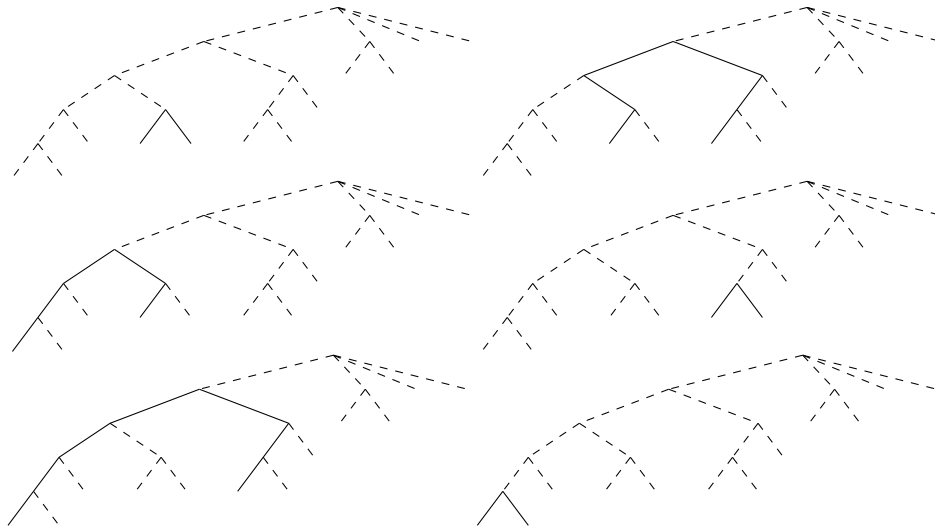
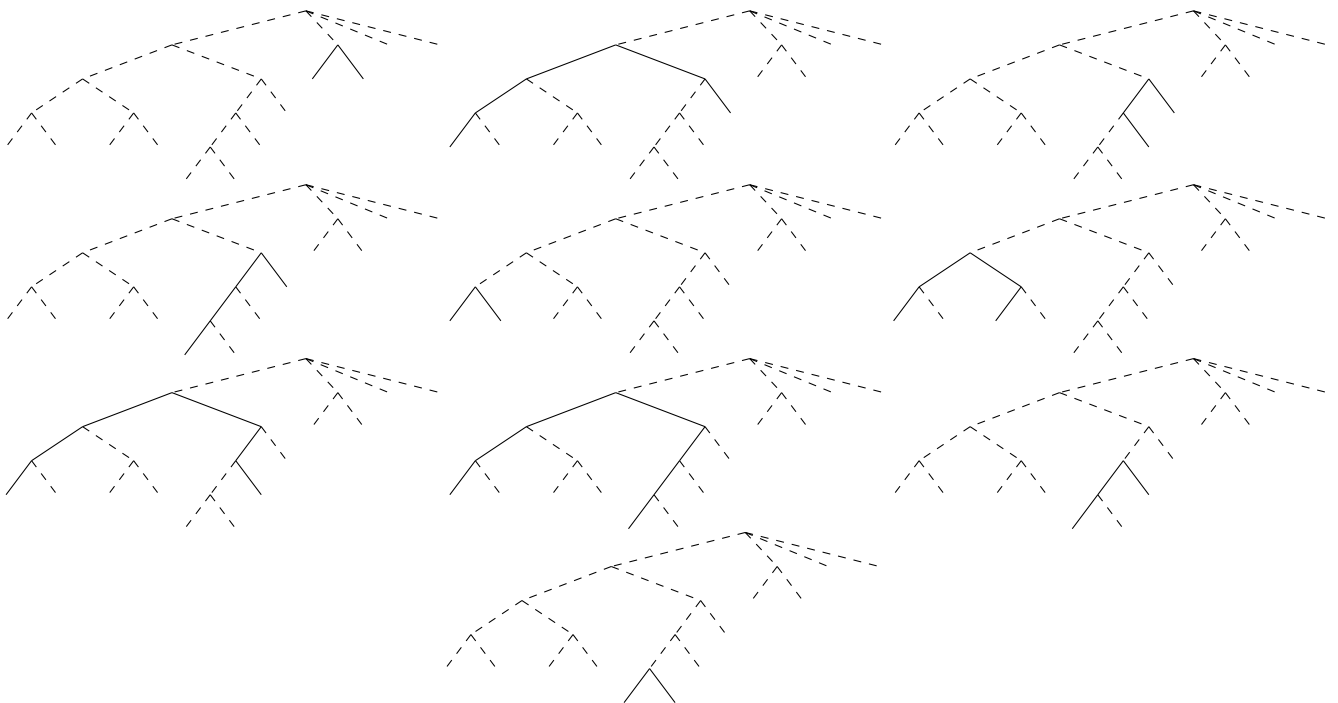
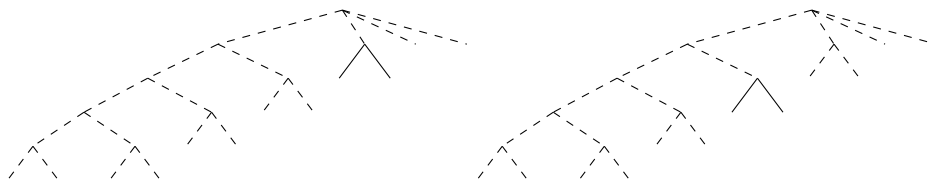
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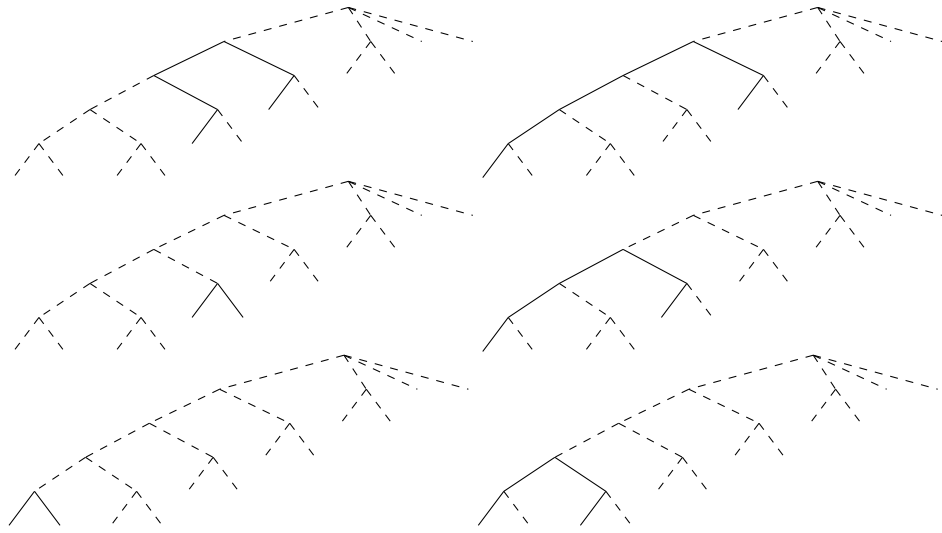
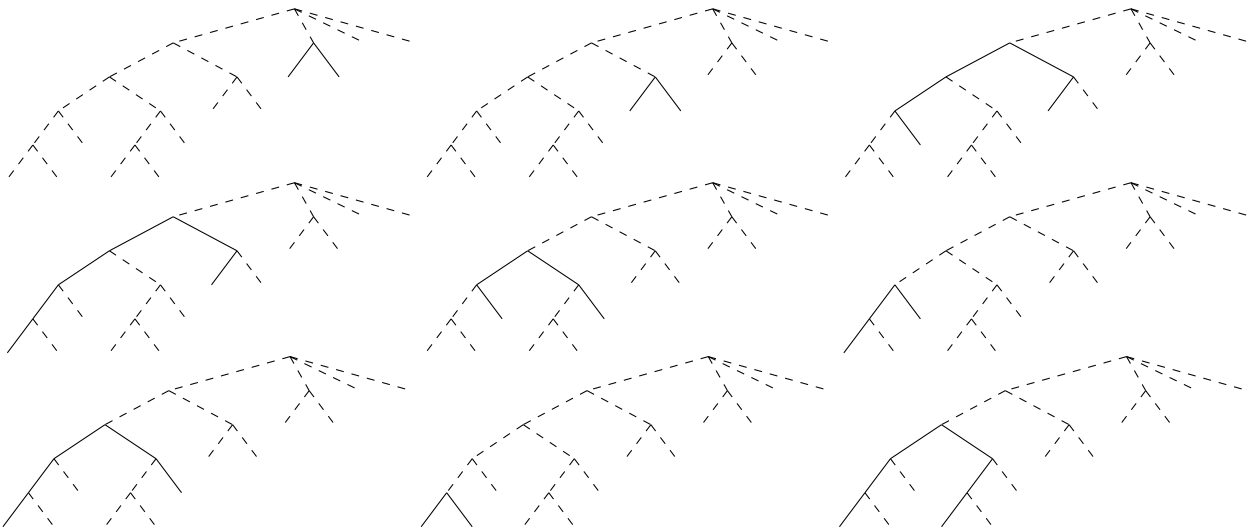
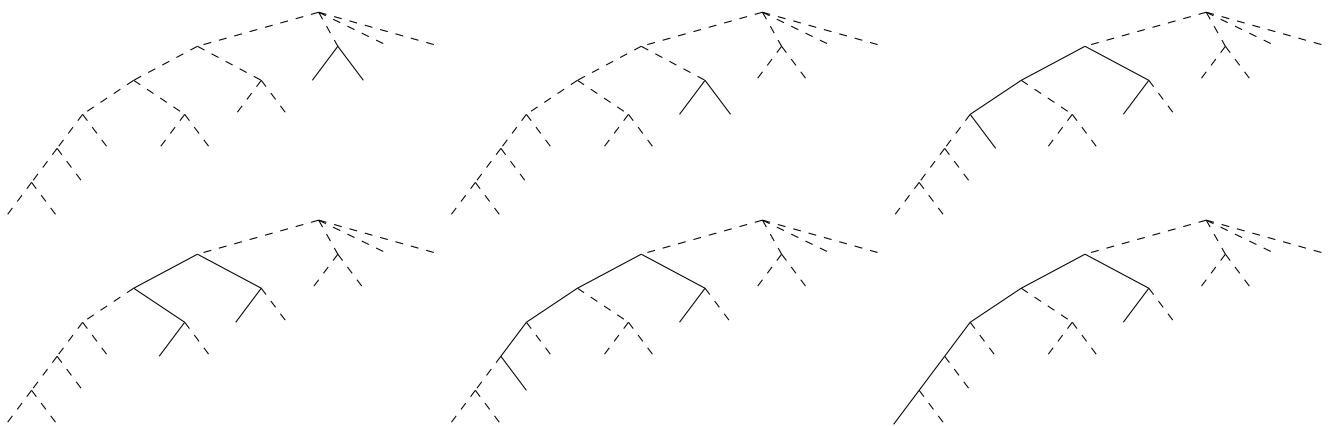
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**Topology 457****Topology 458**

**Topology 459****Topology 460**

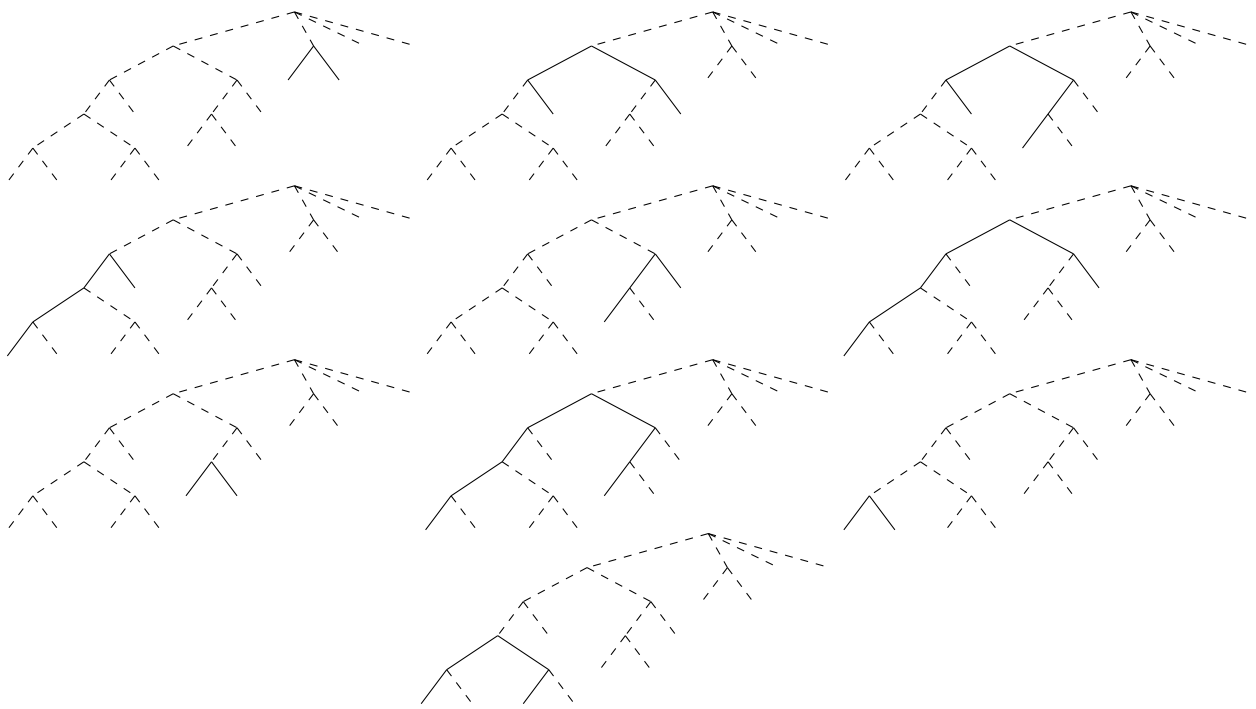


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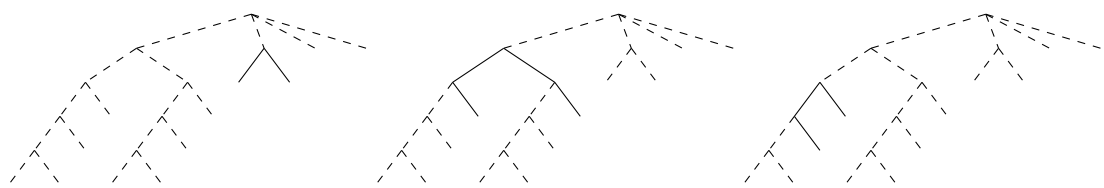
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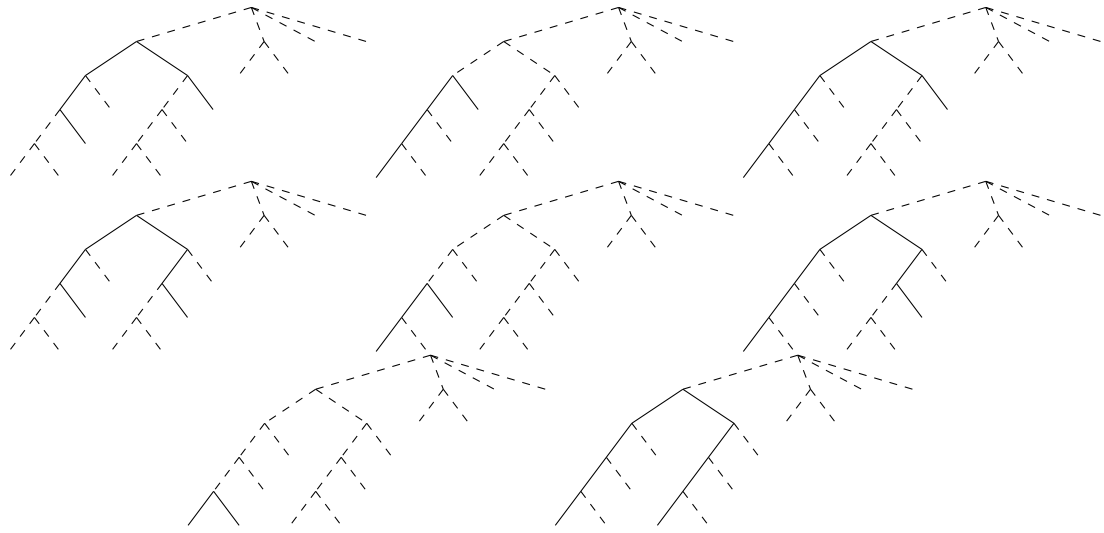
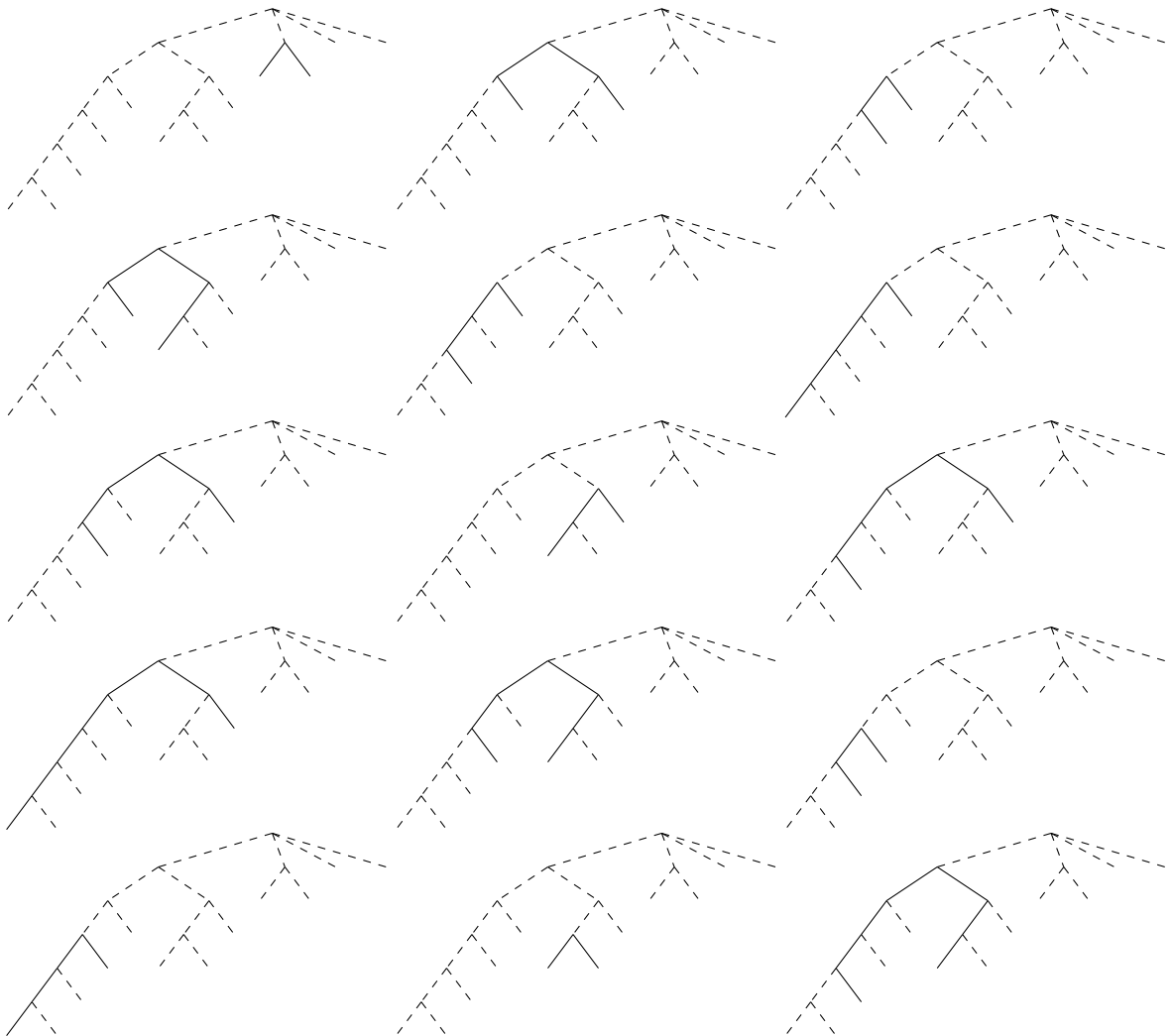


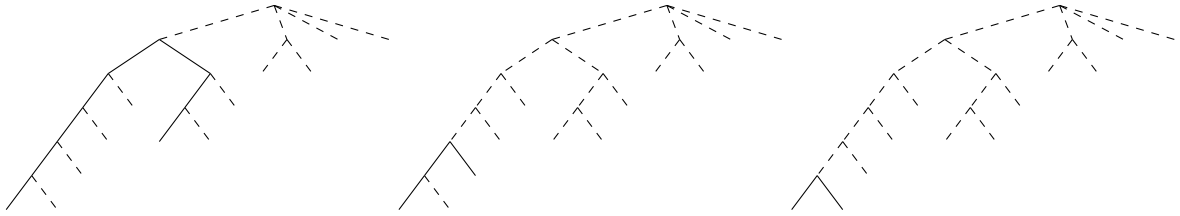
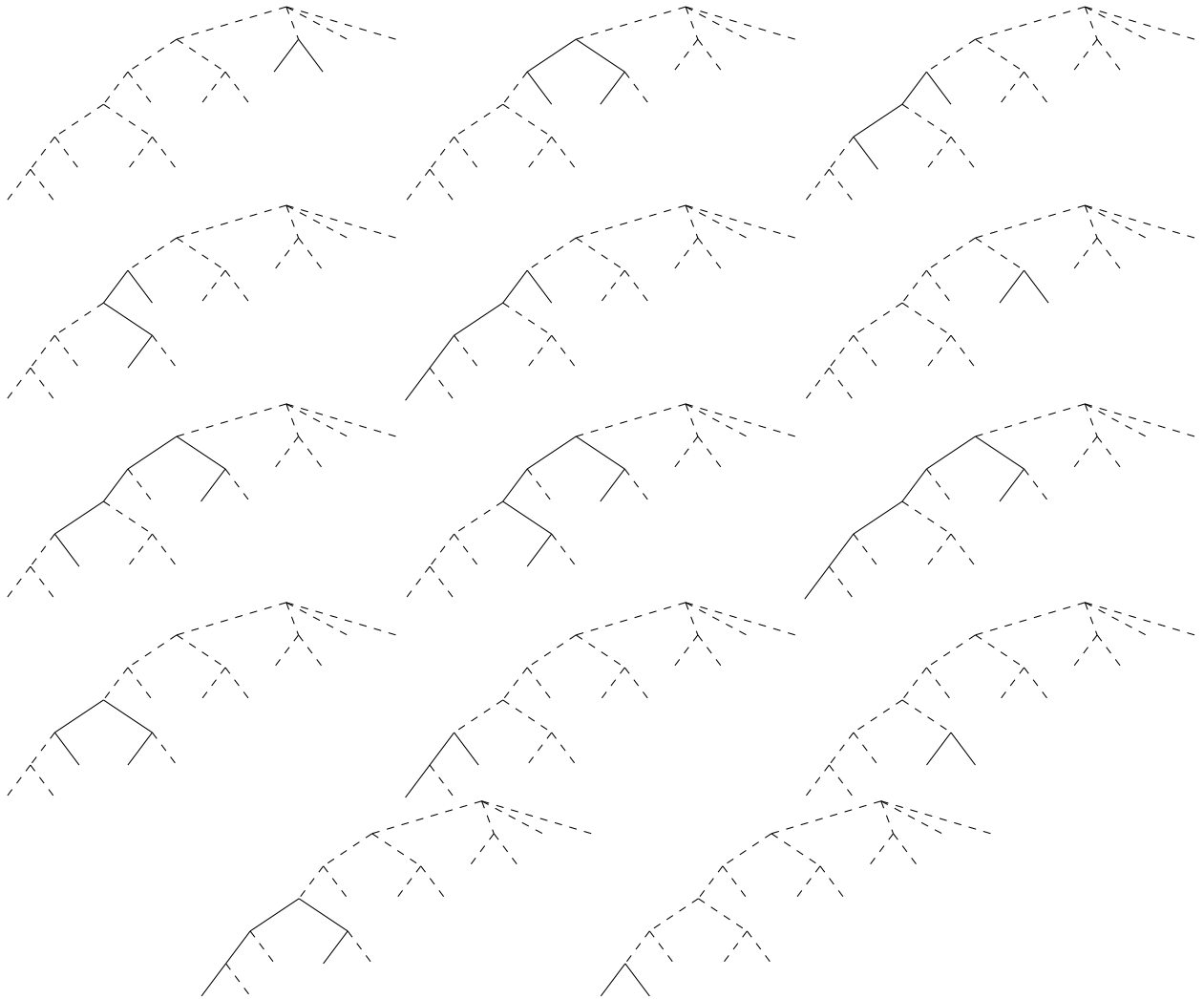
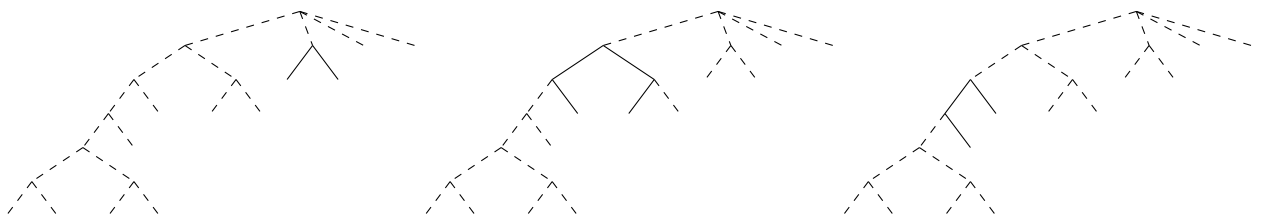
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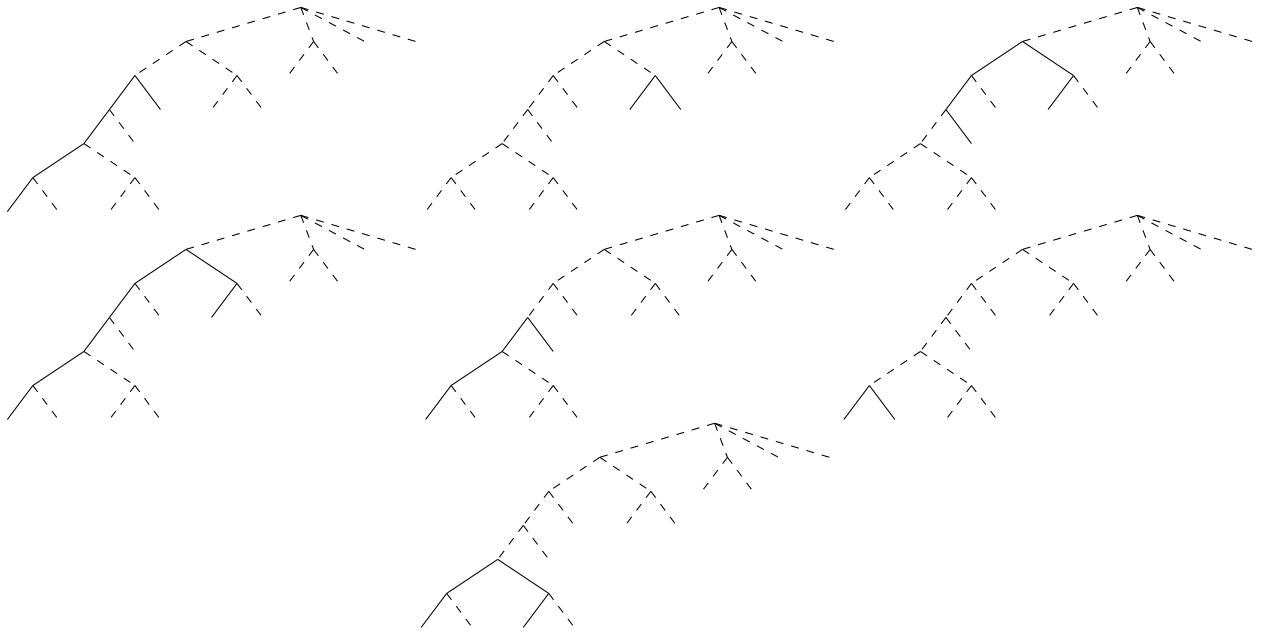
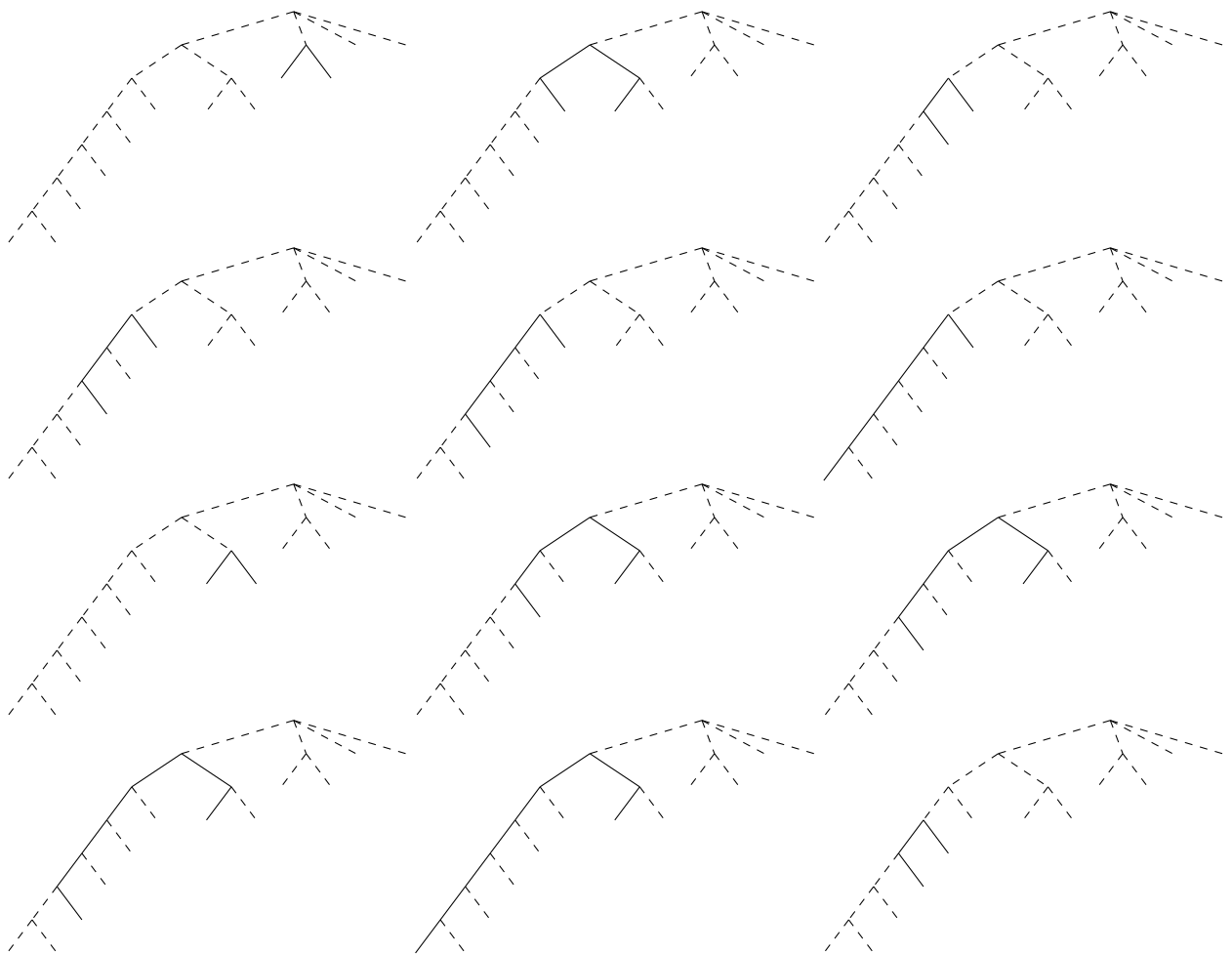


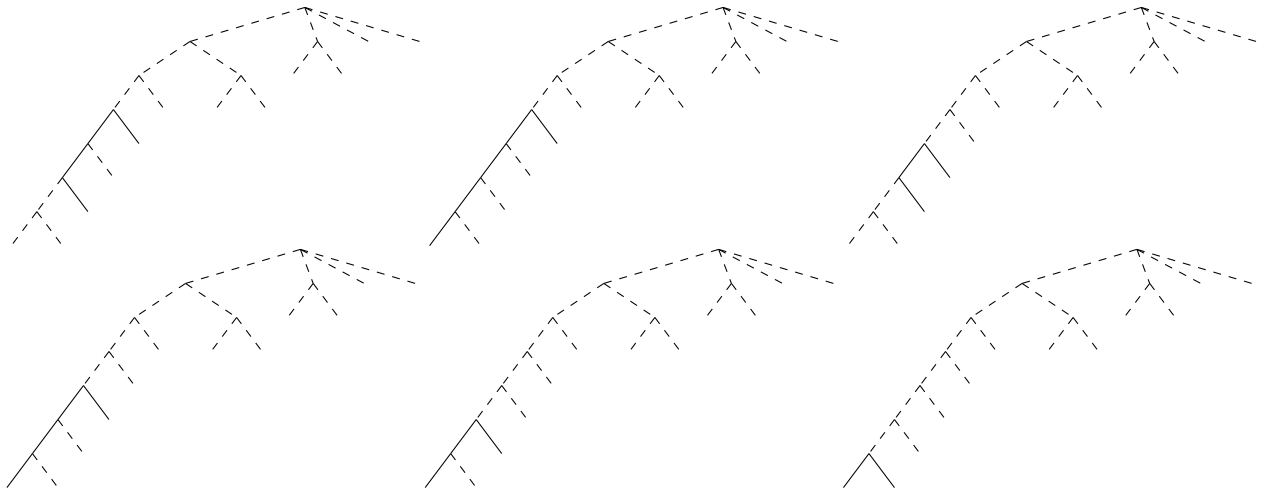
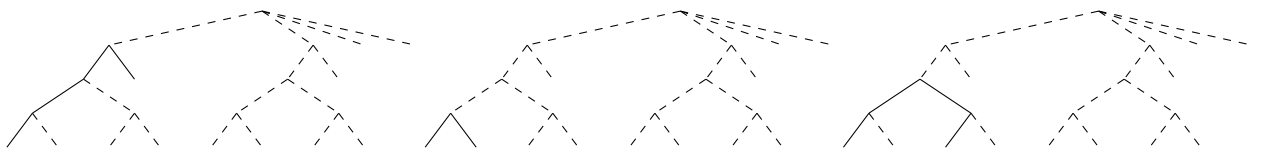
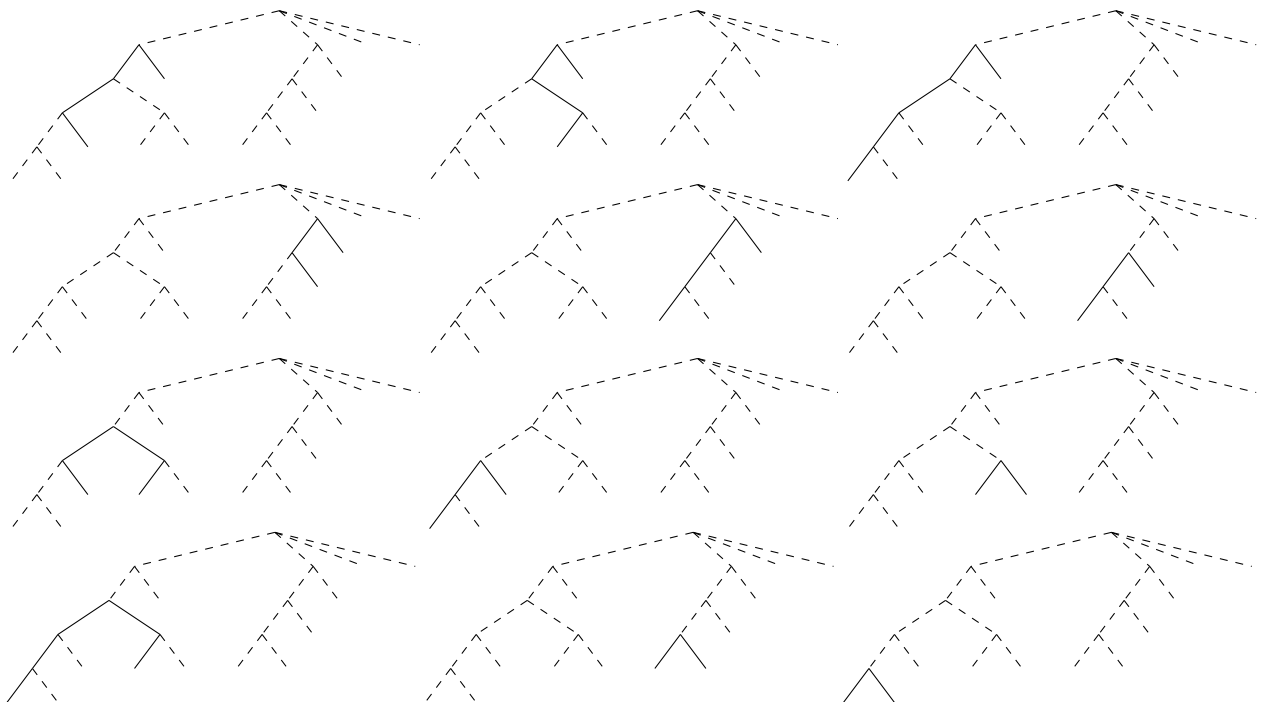
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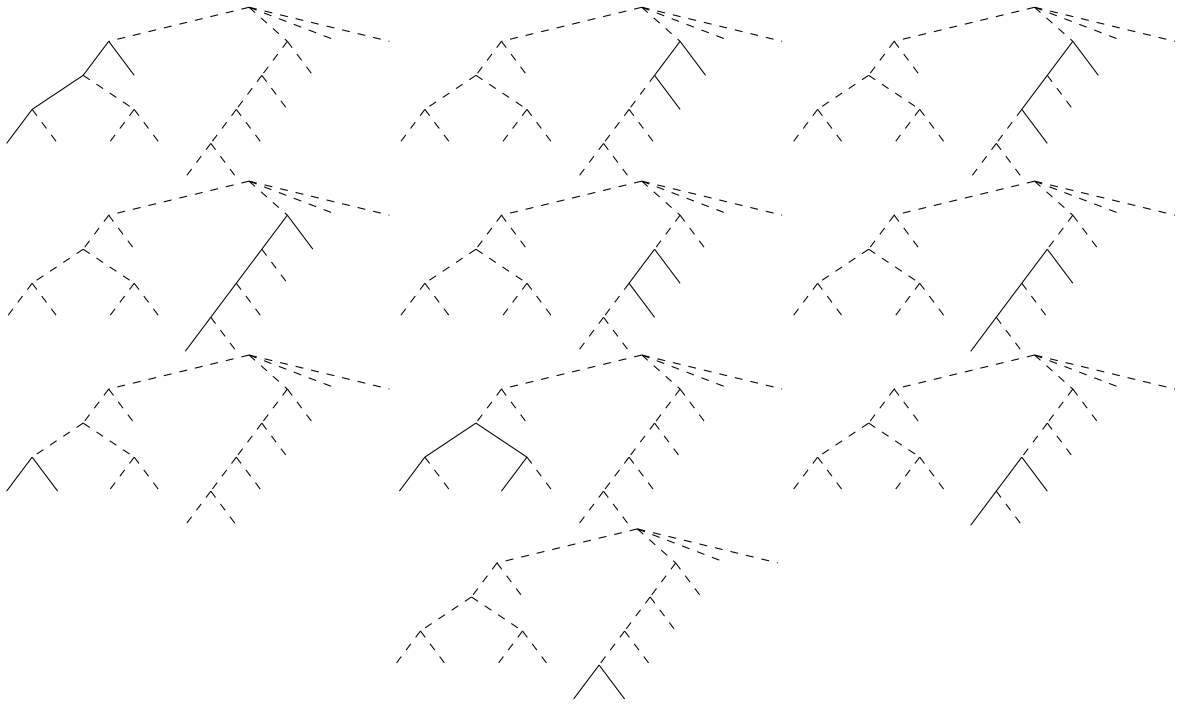
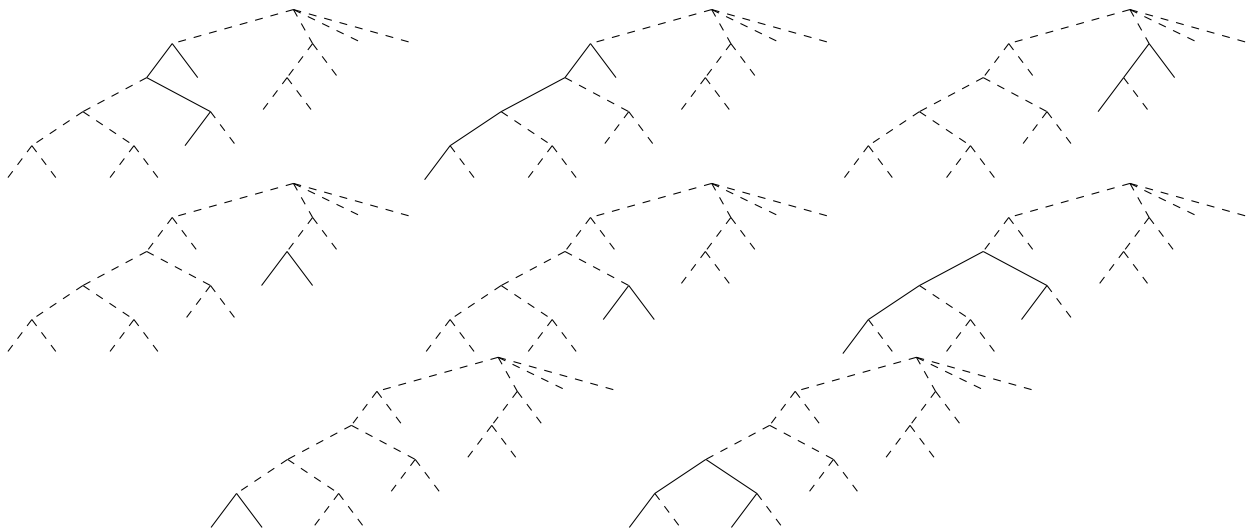
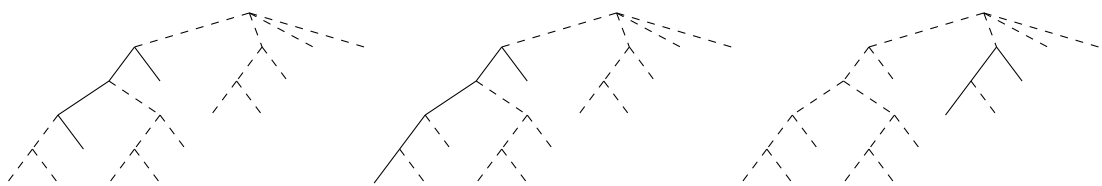


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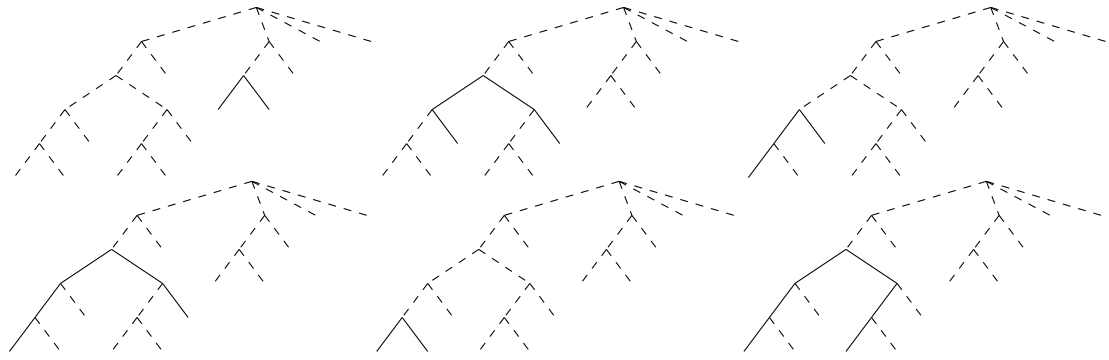
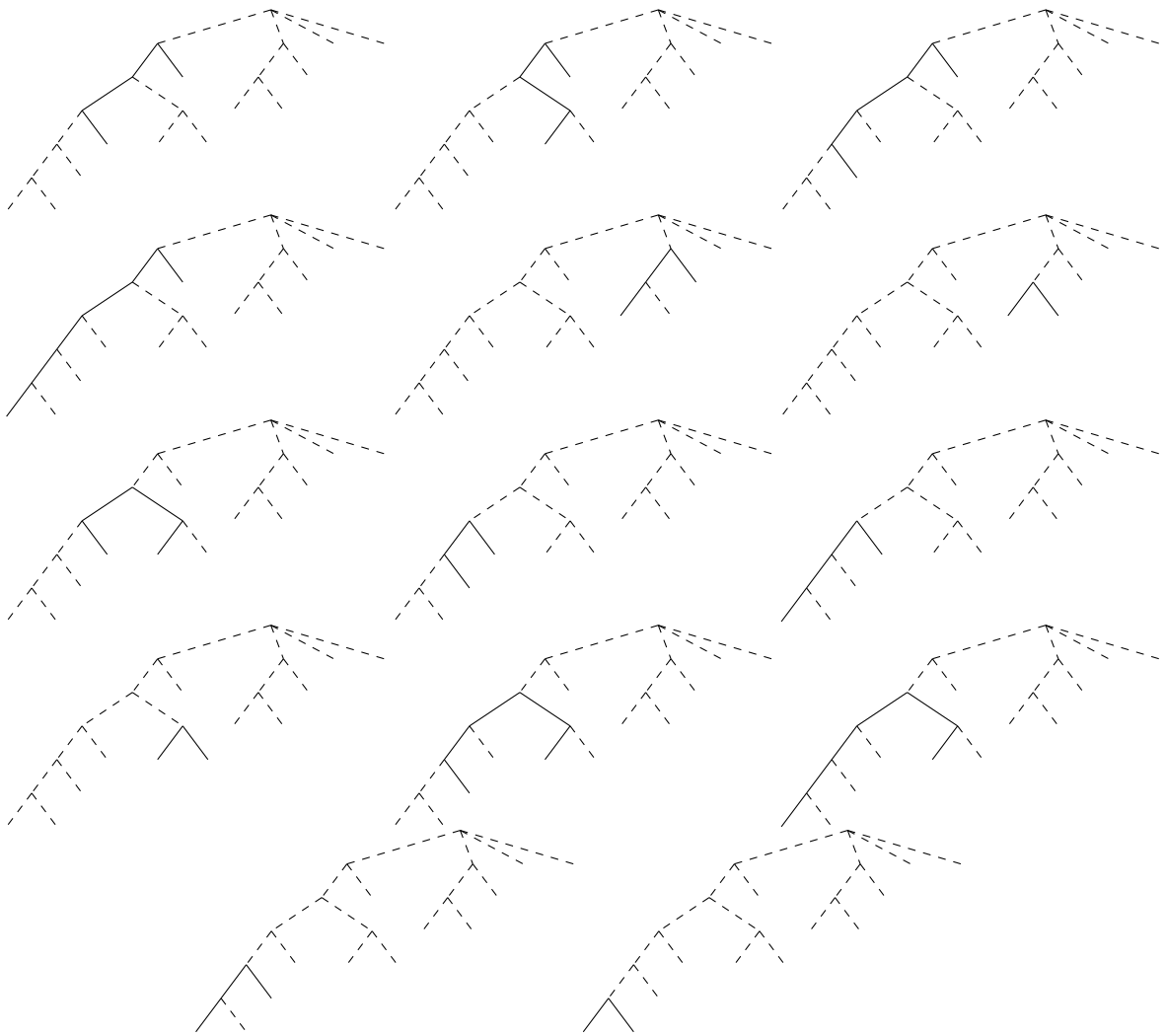
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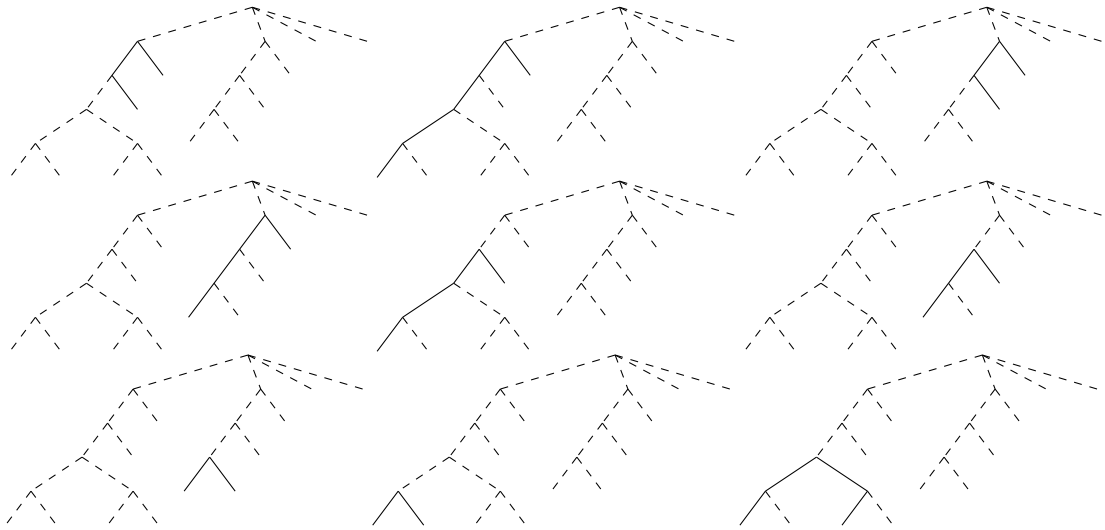
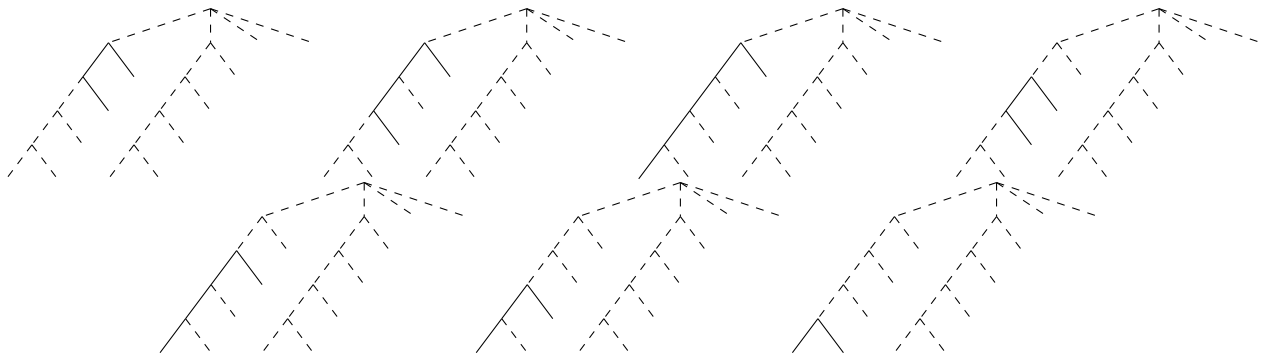
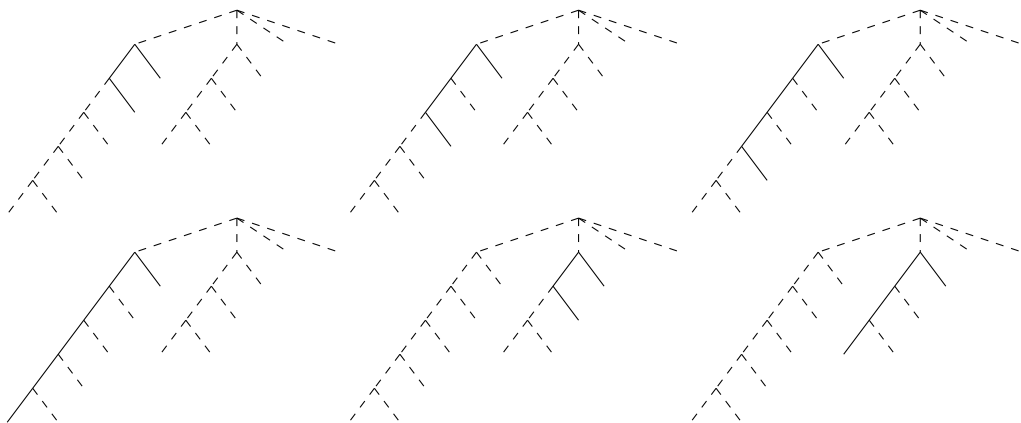
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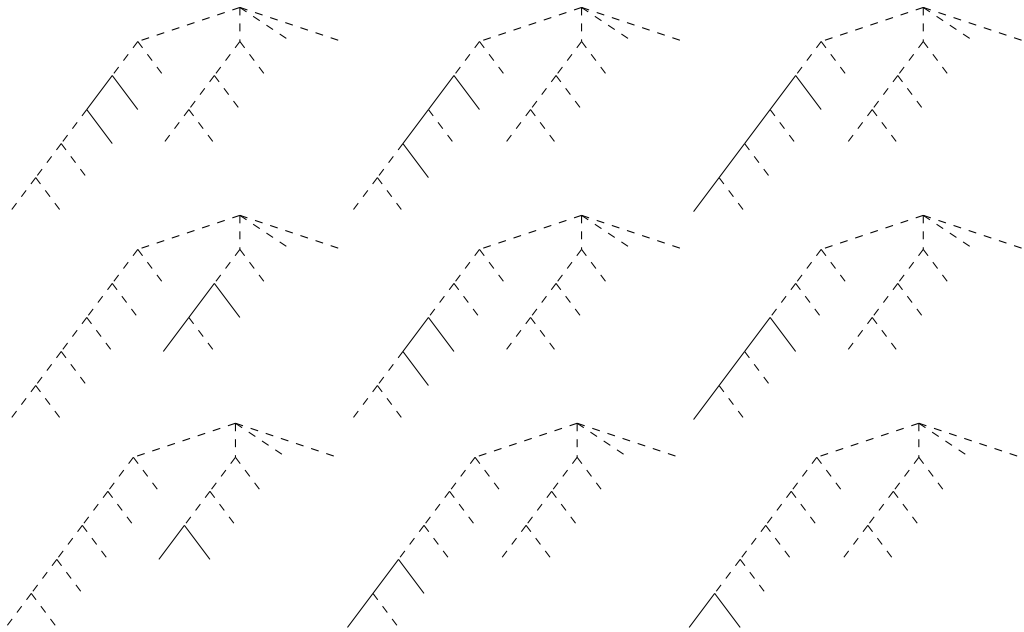
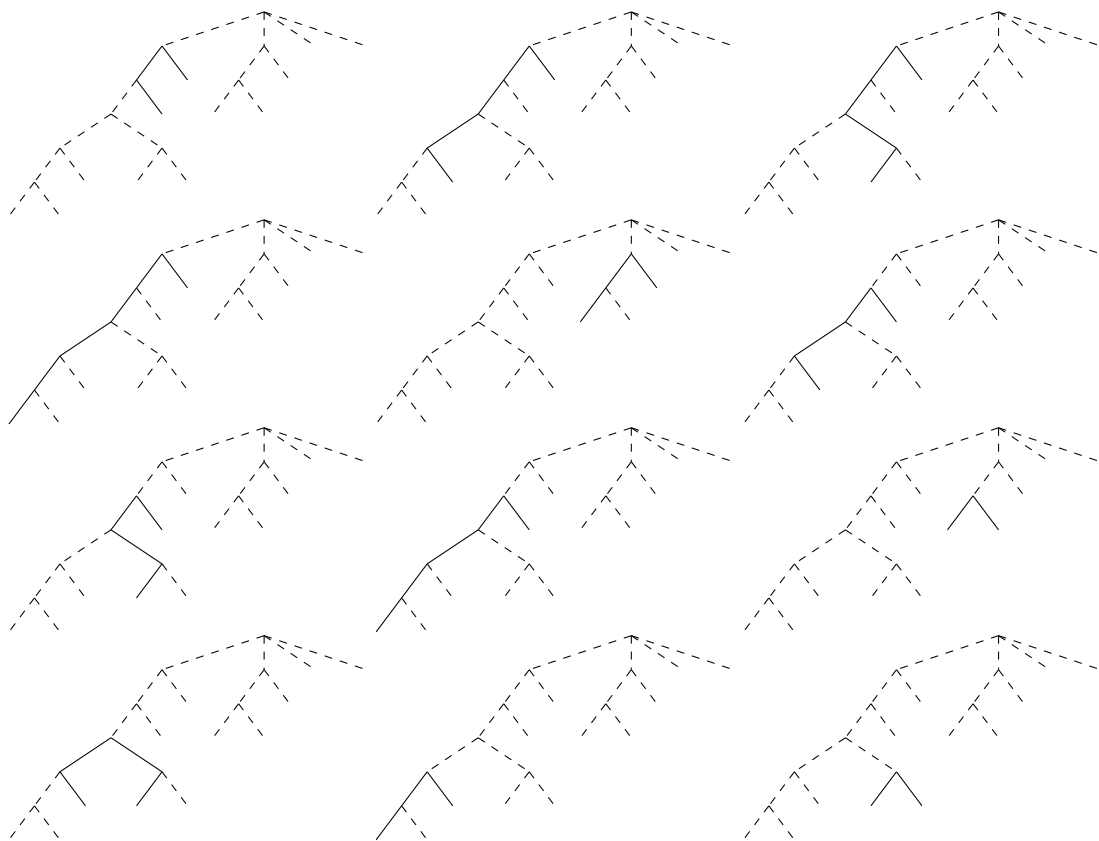
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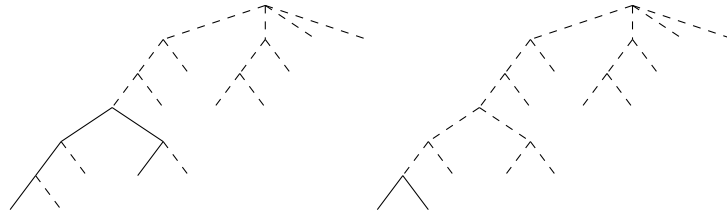
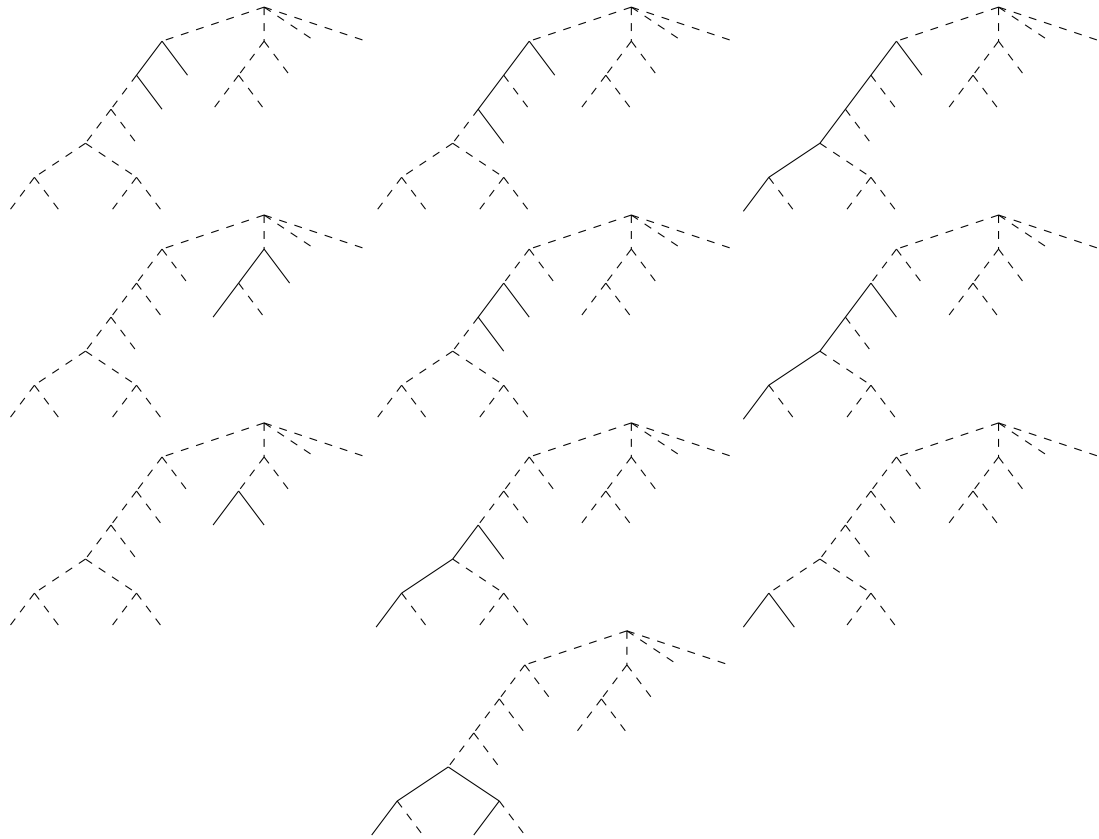
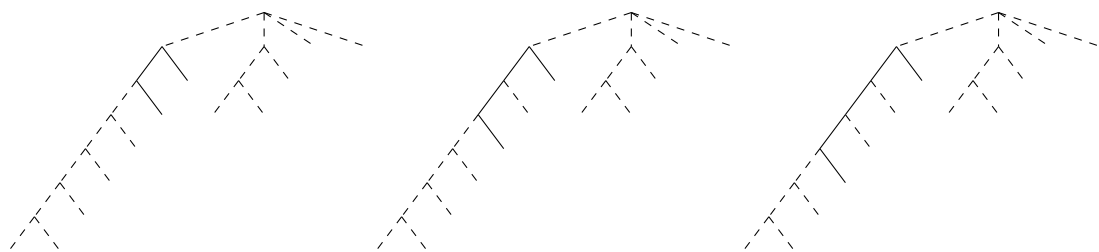
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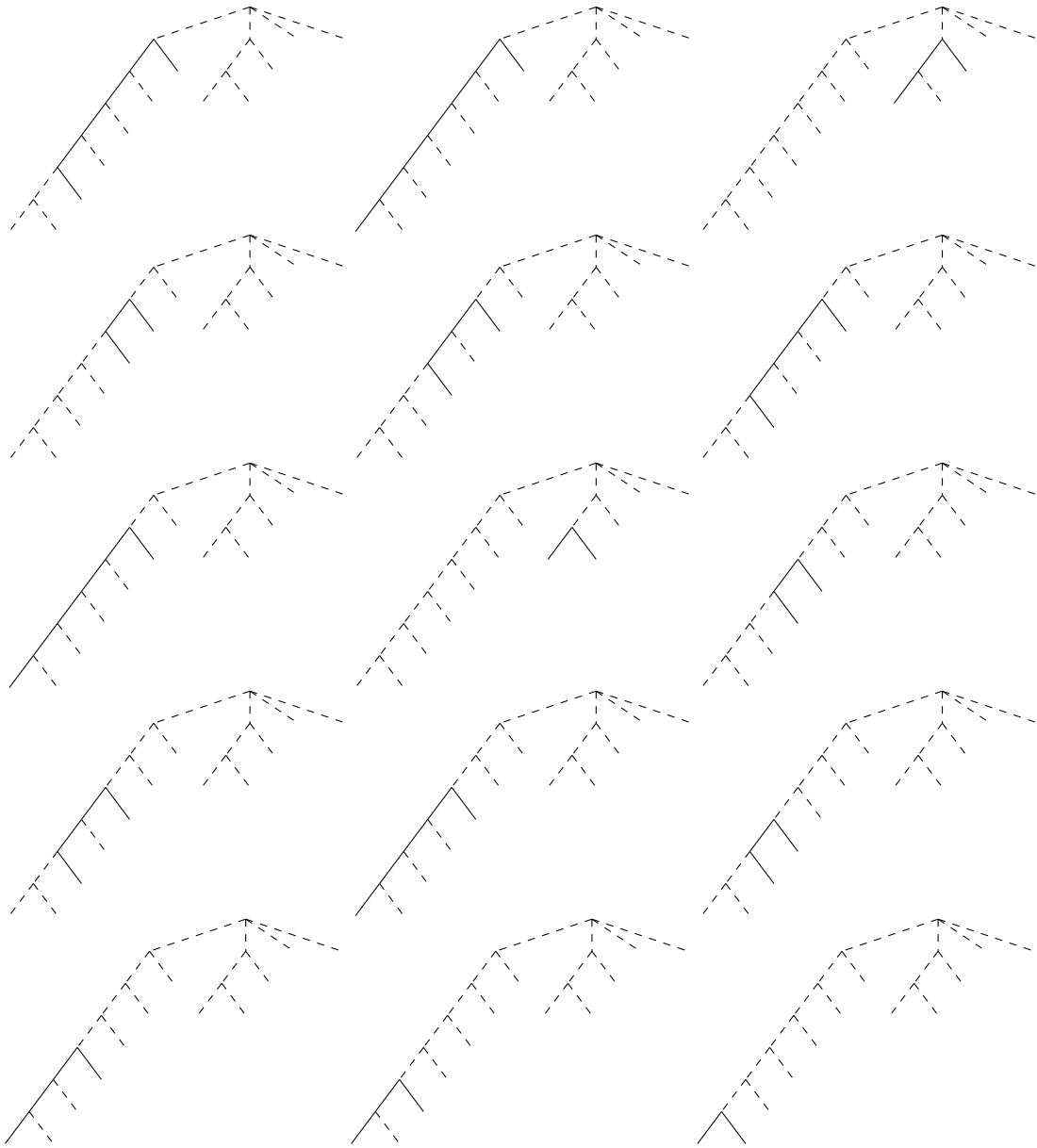
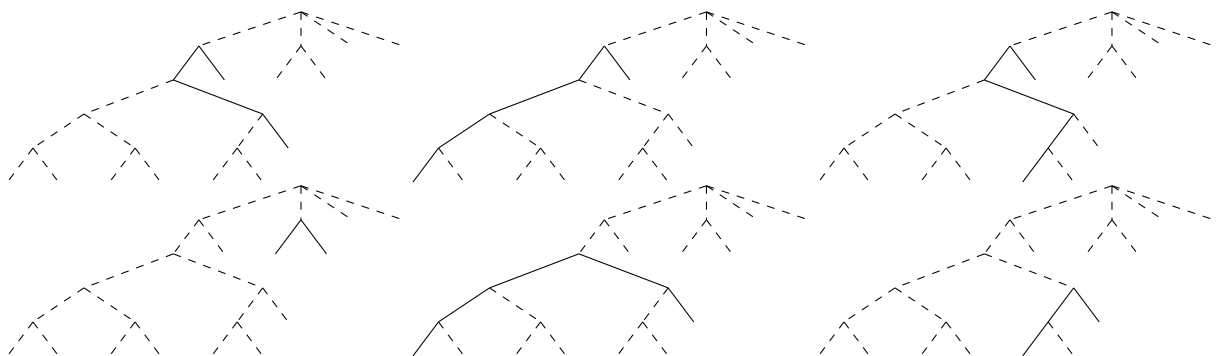


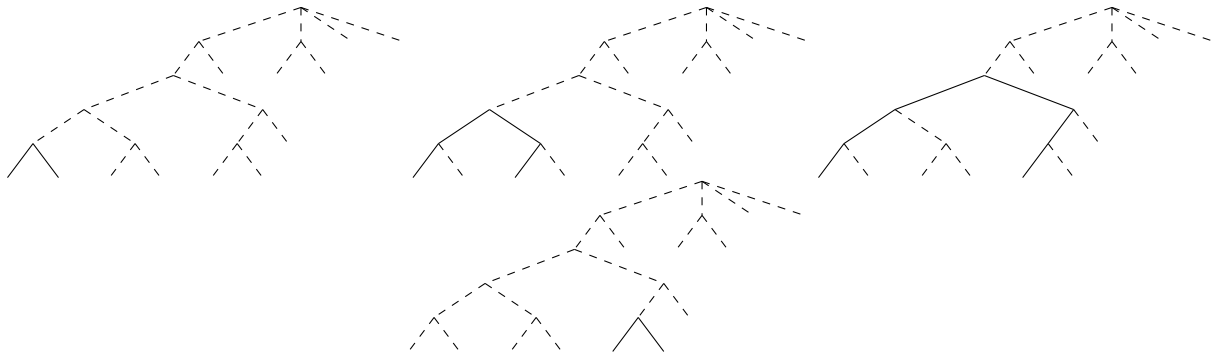
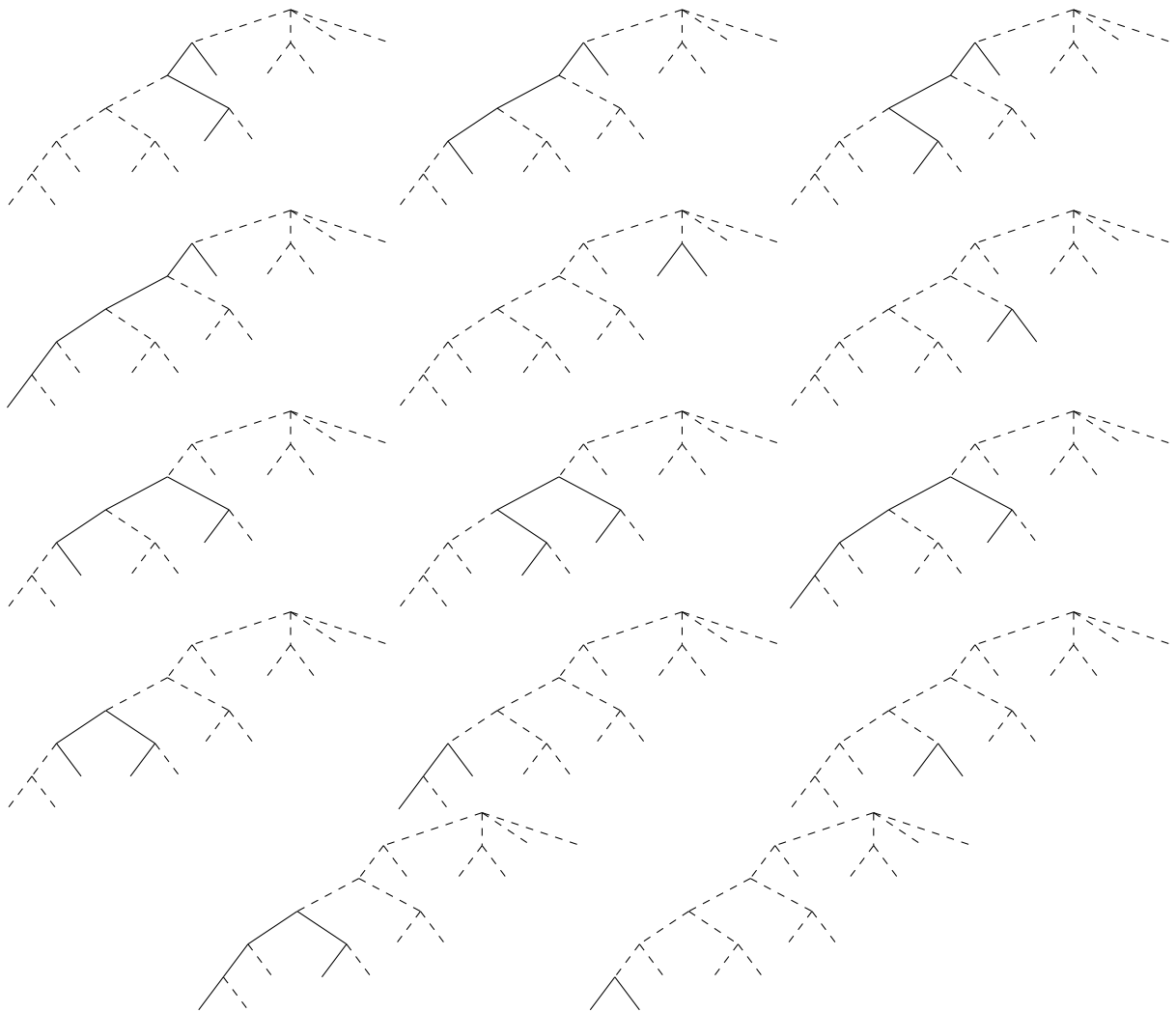
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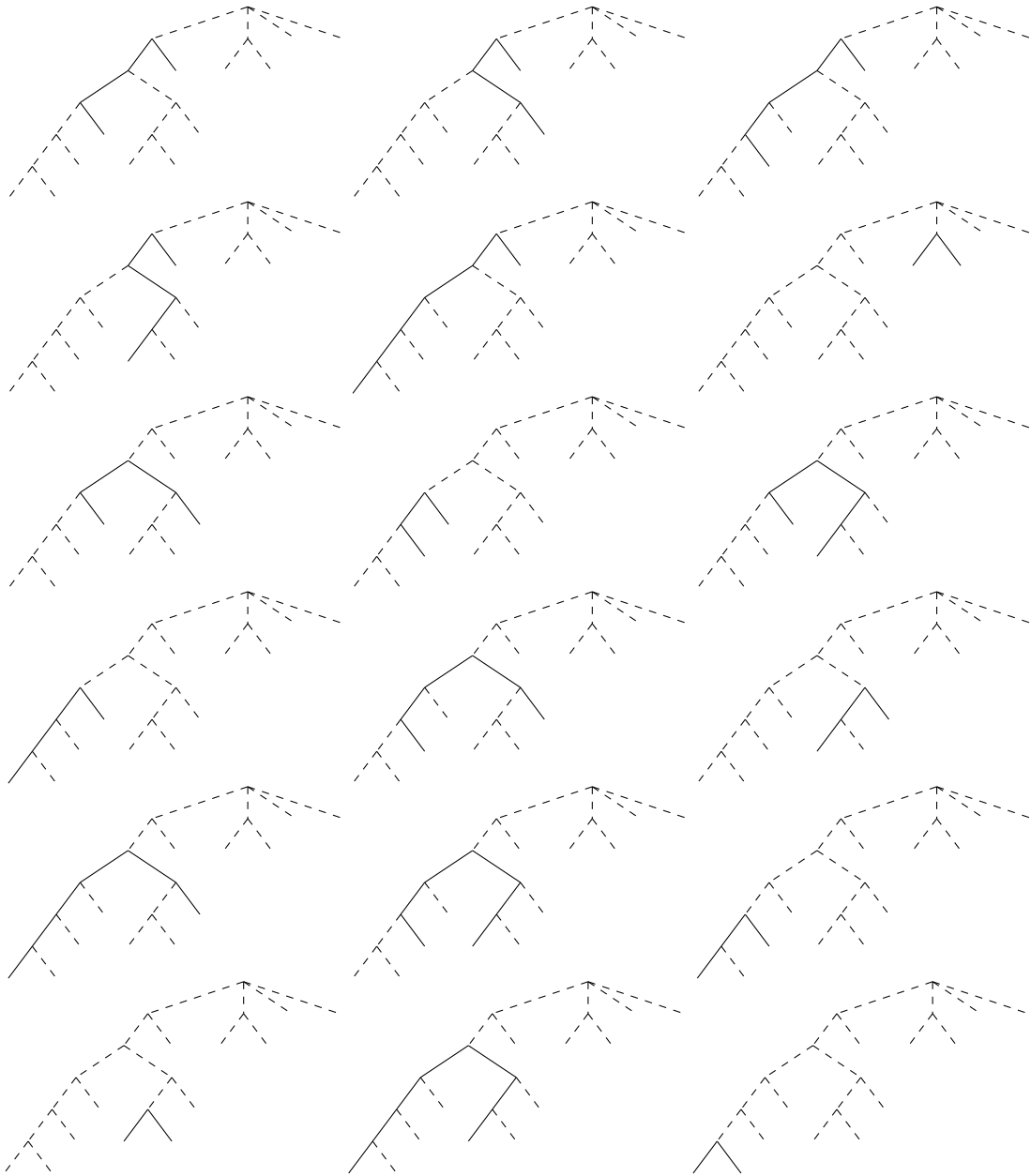
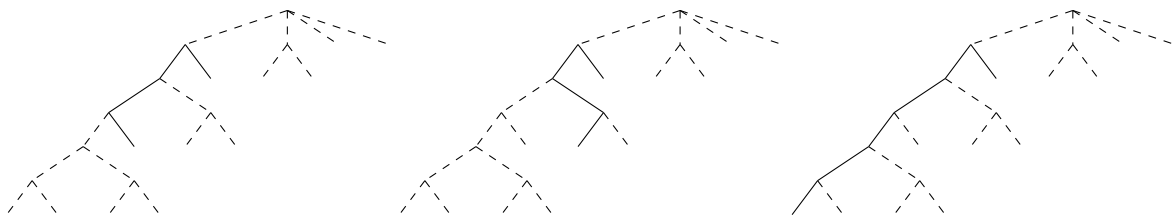
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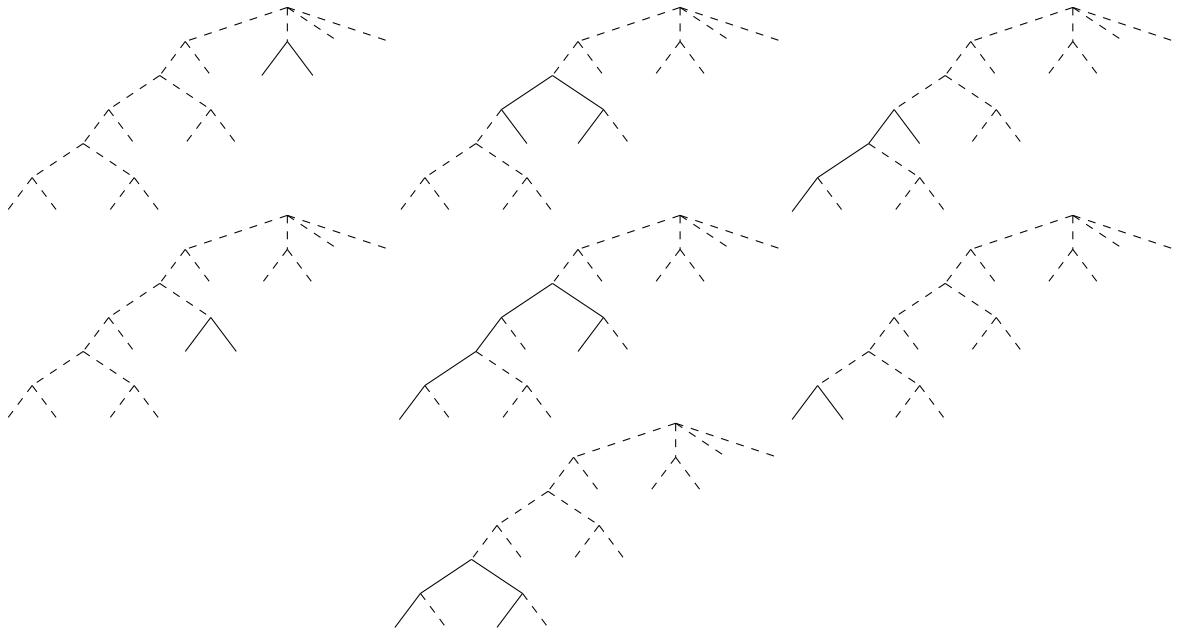
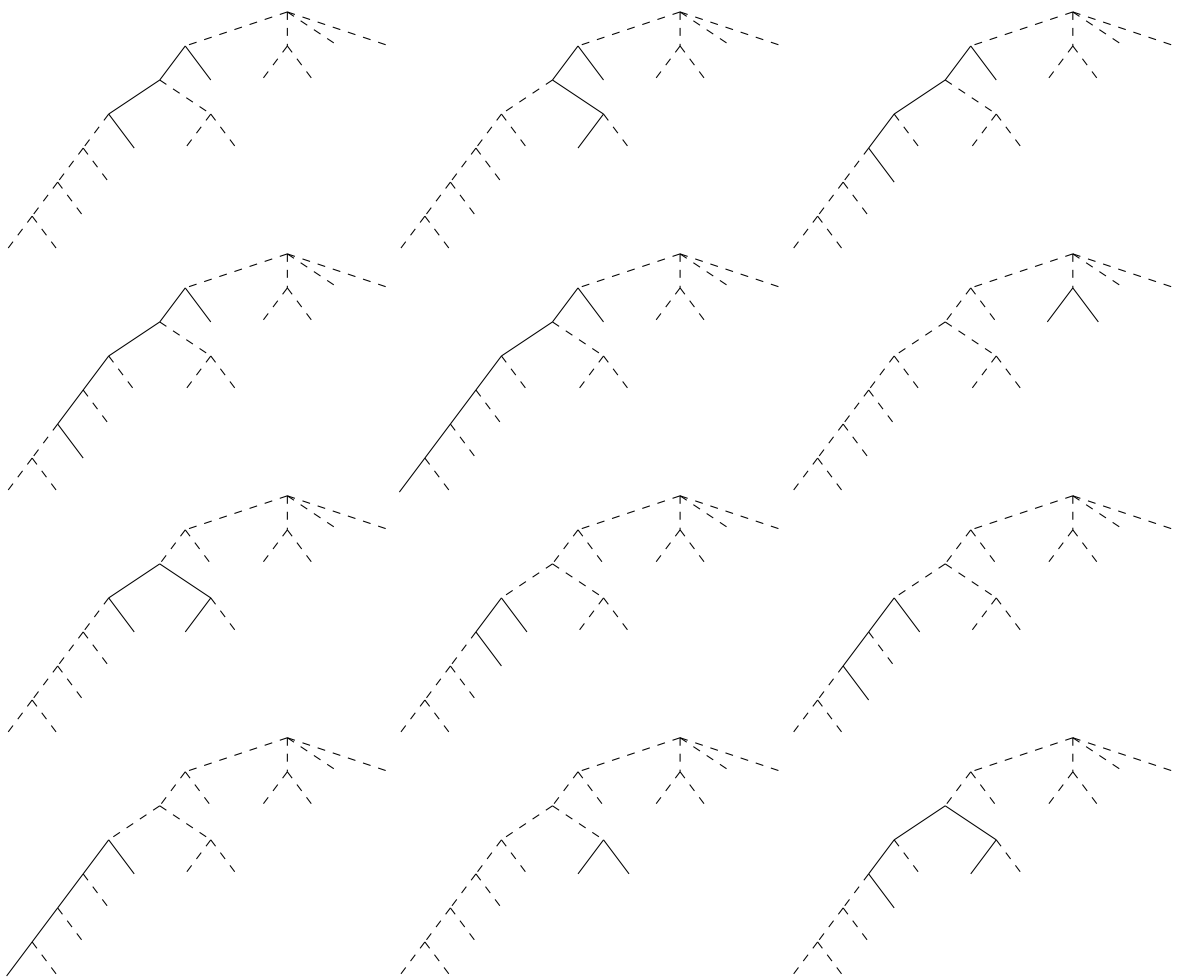
**Topology 480**

**Topology 481****Topology 482**

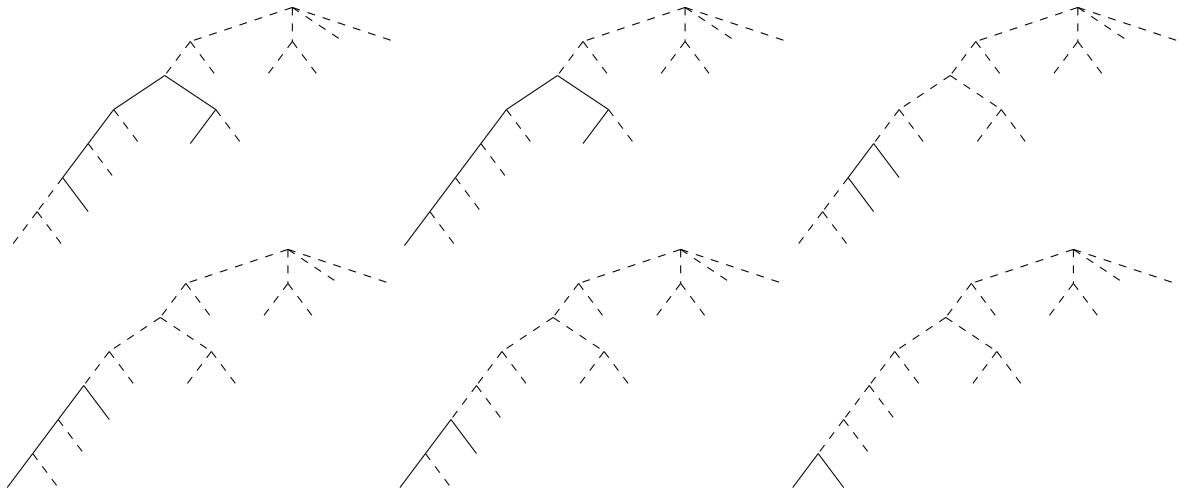
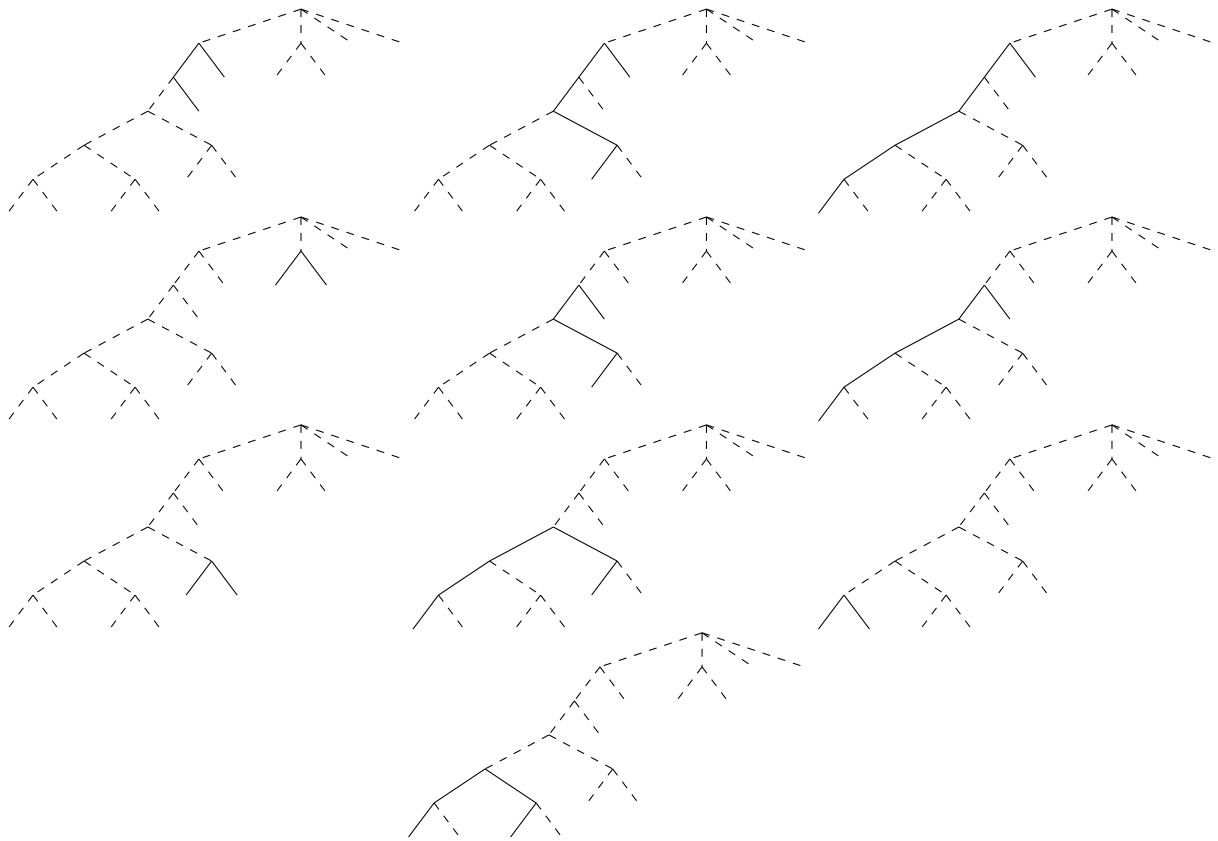
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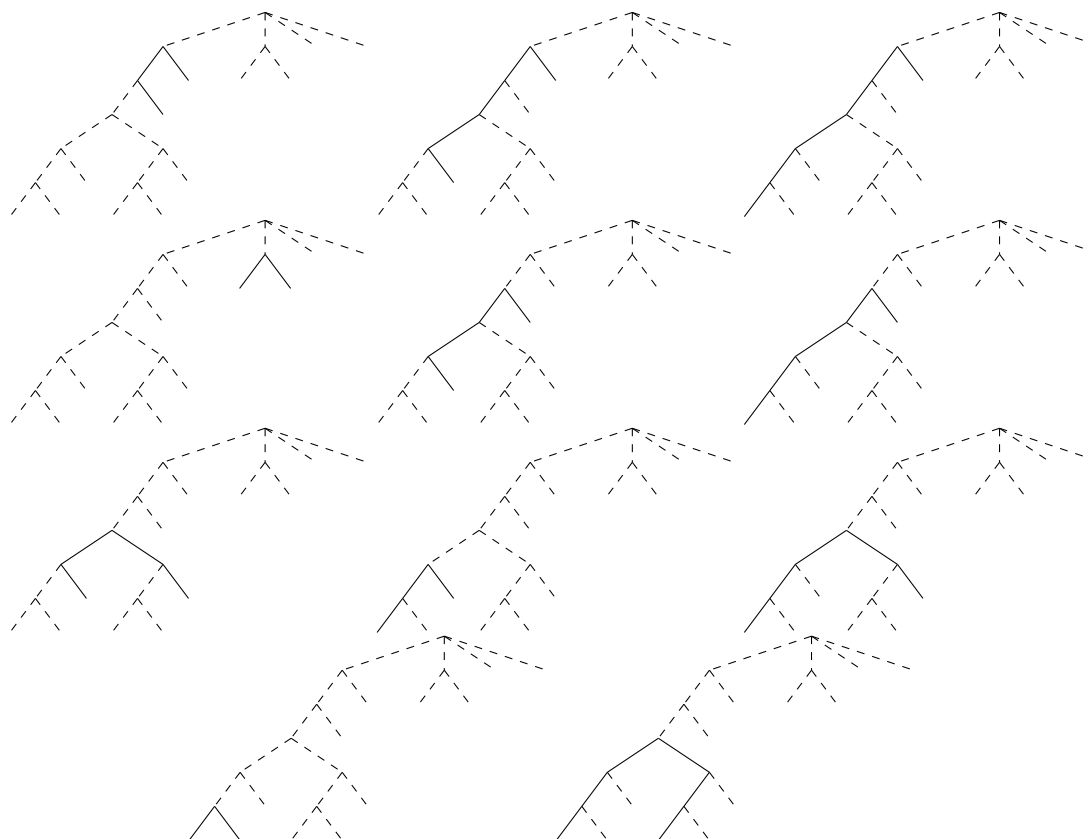
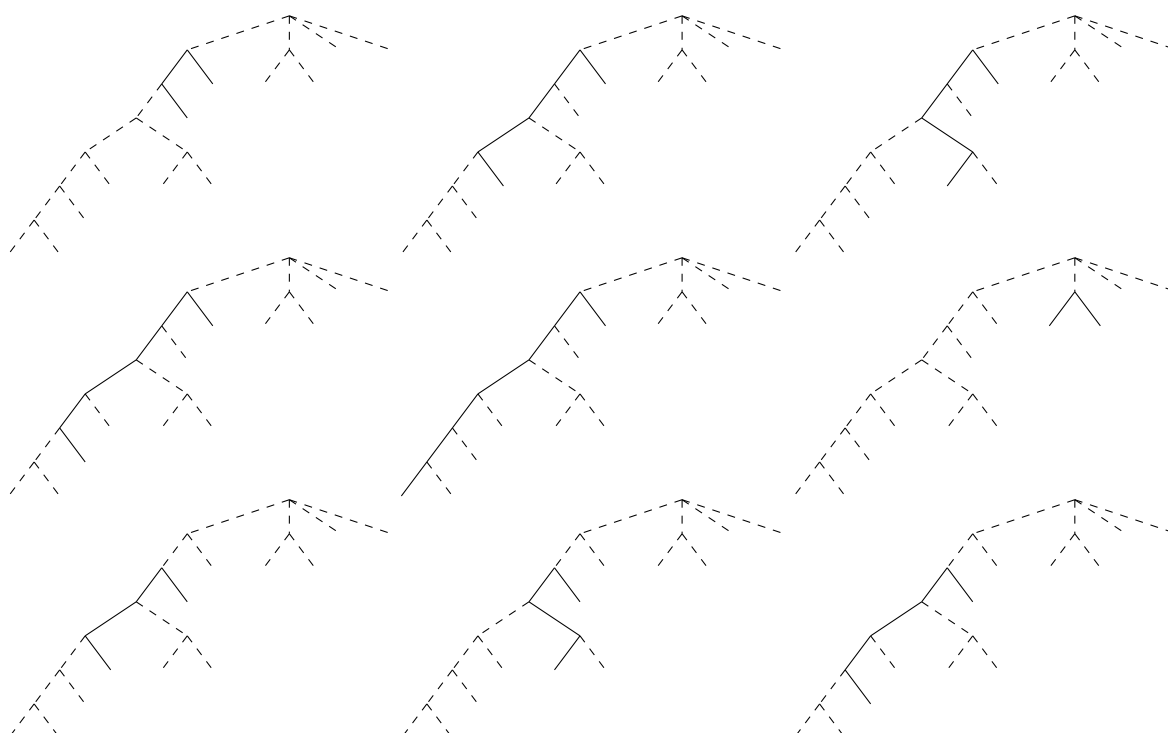
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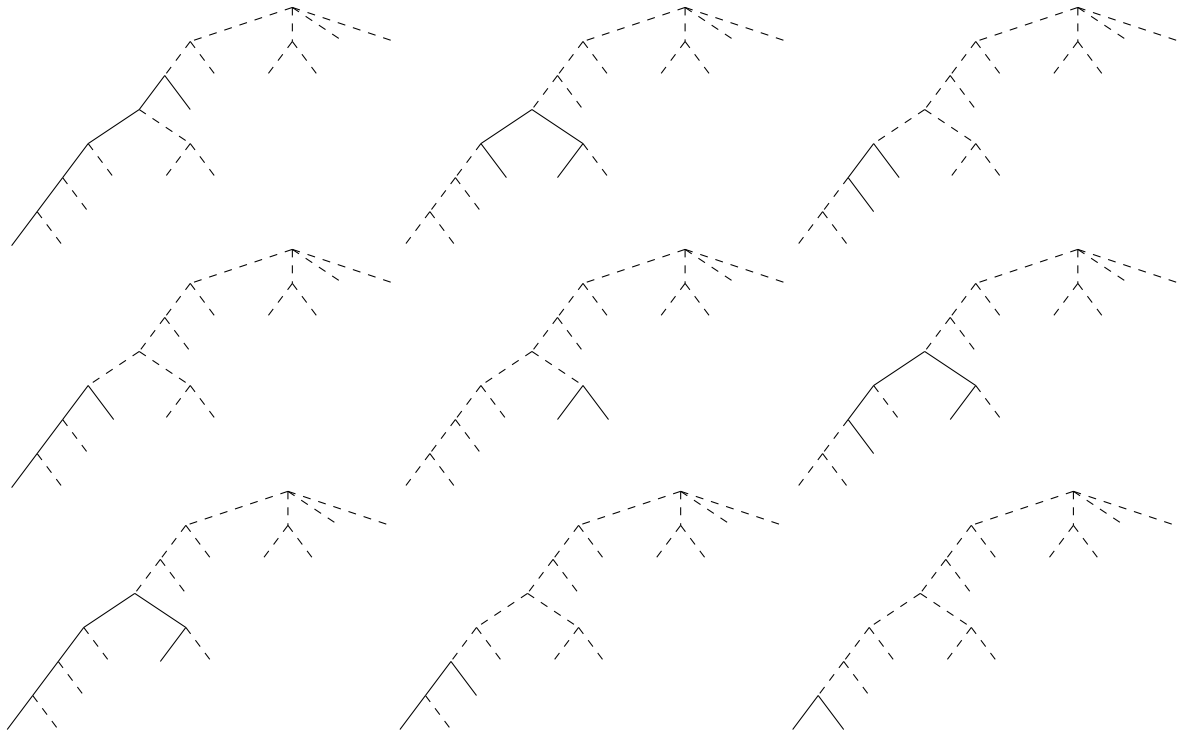
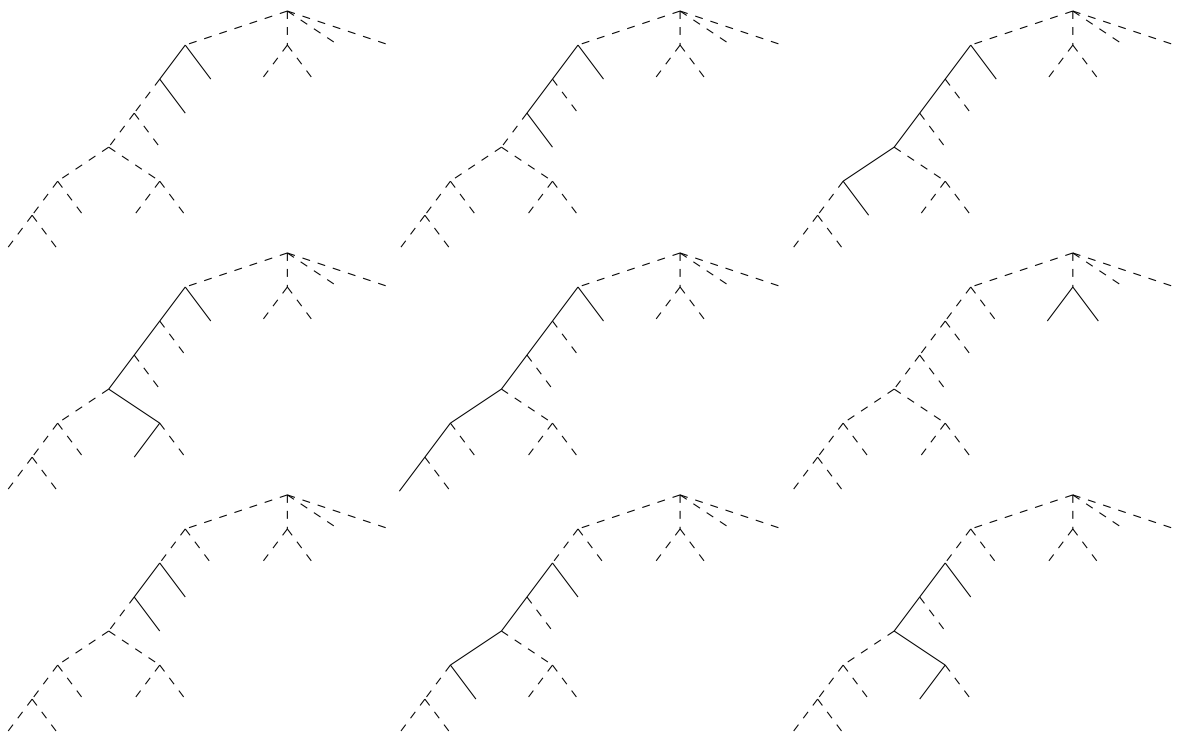
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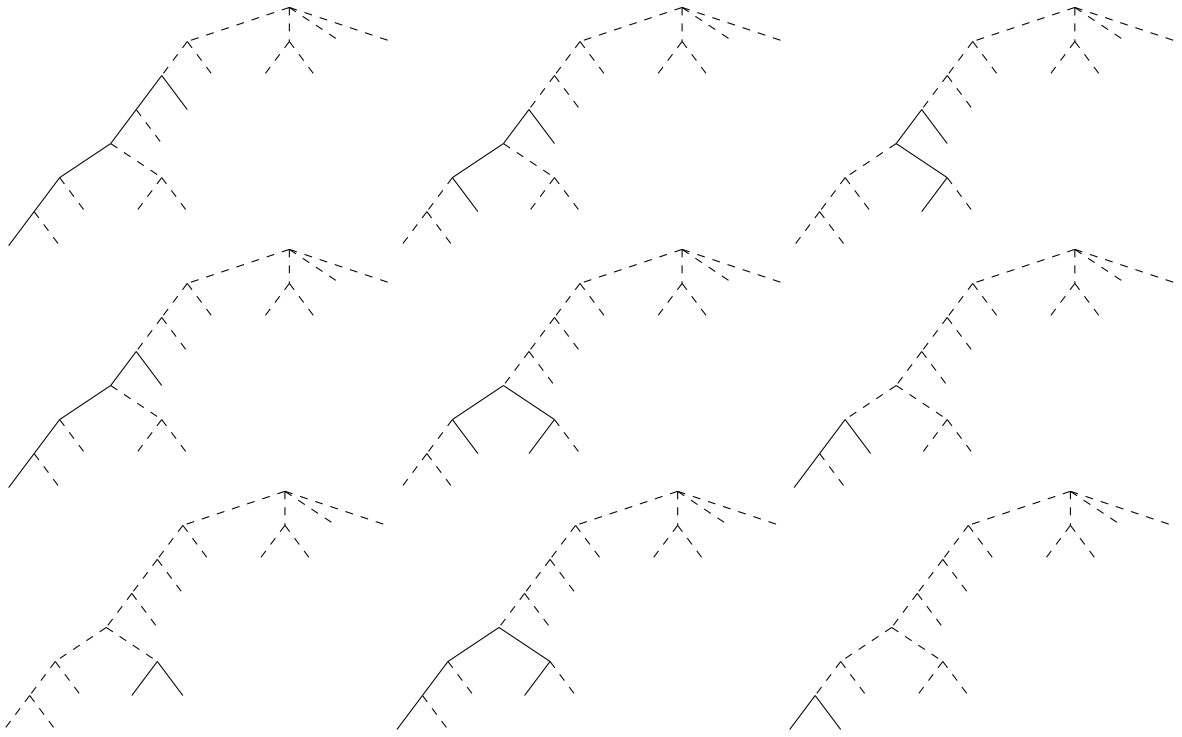
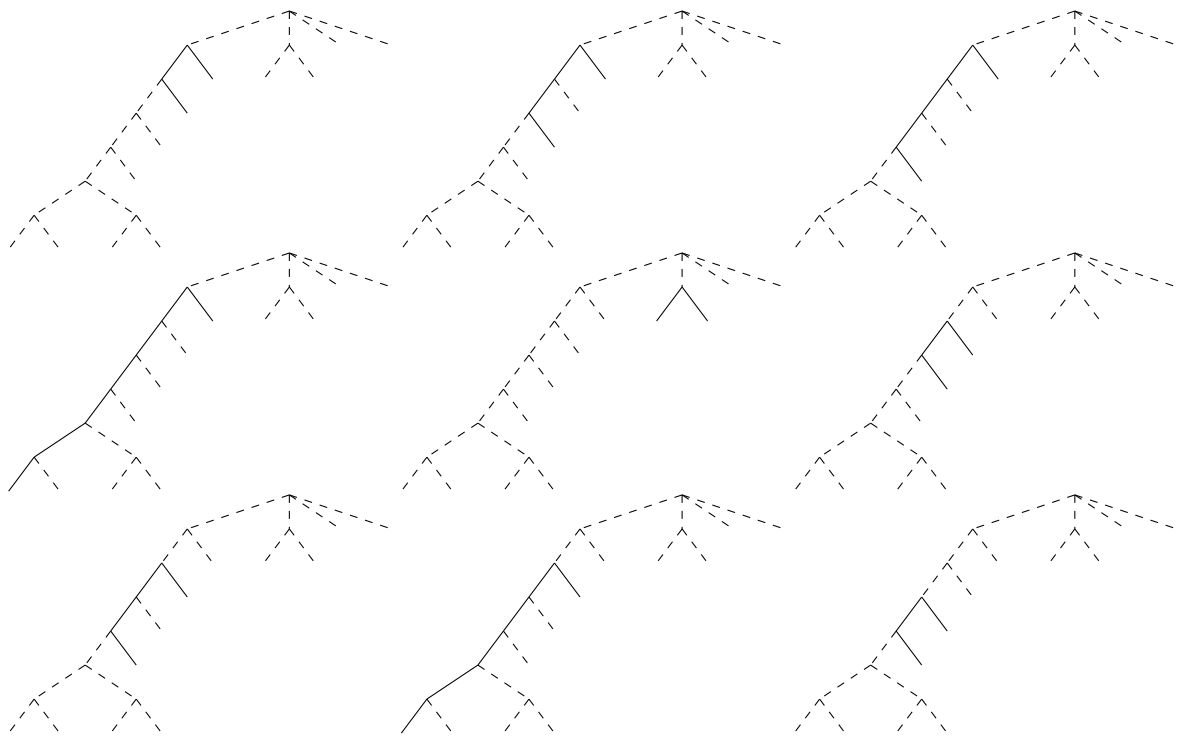
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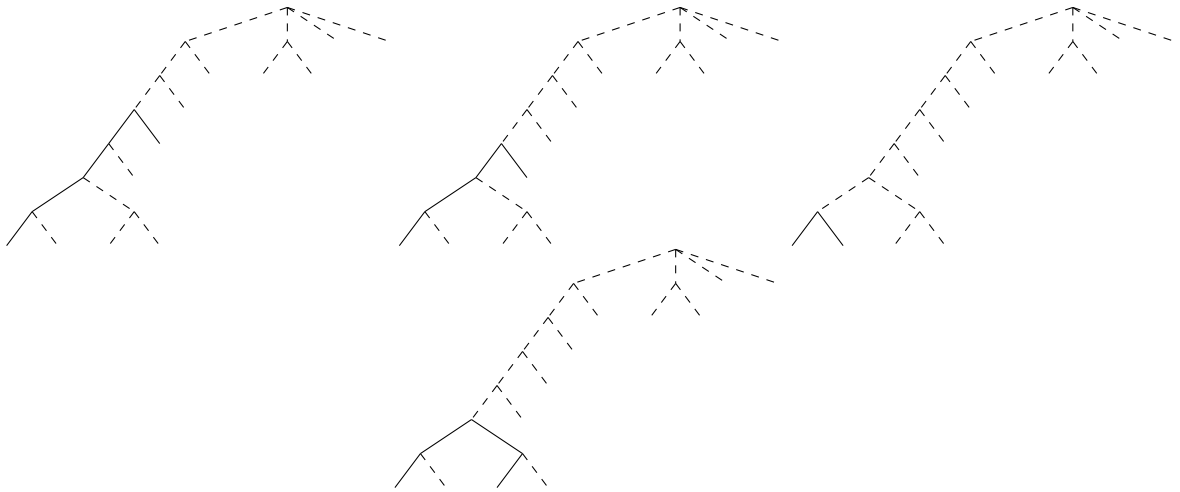
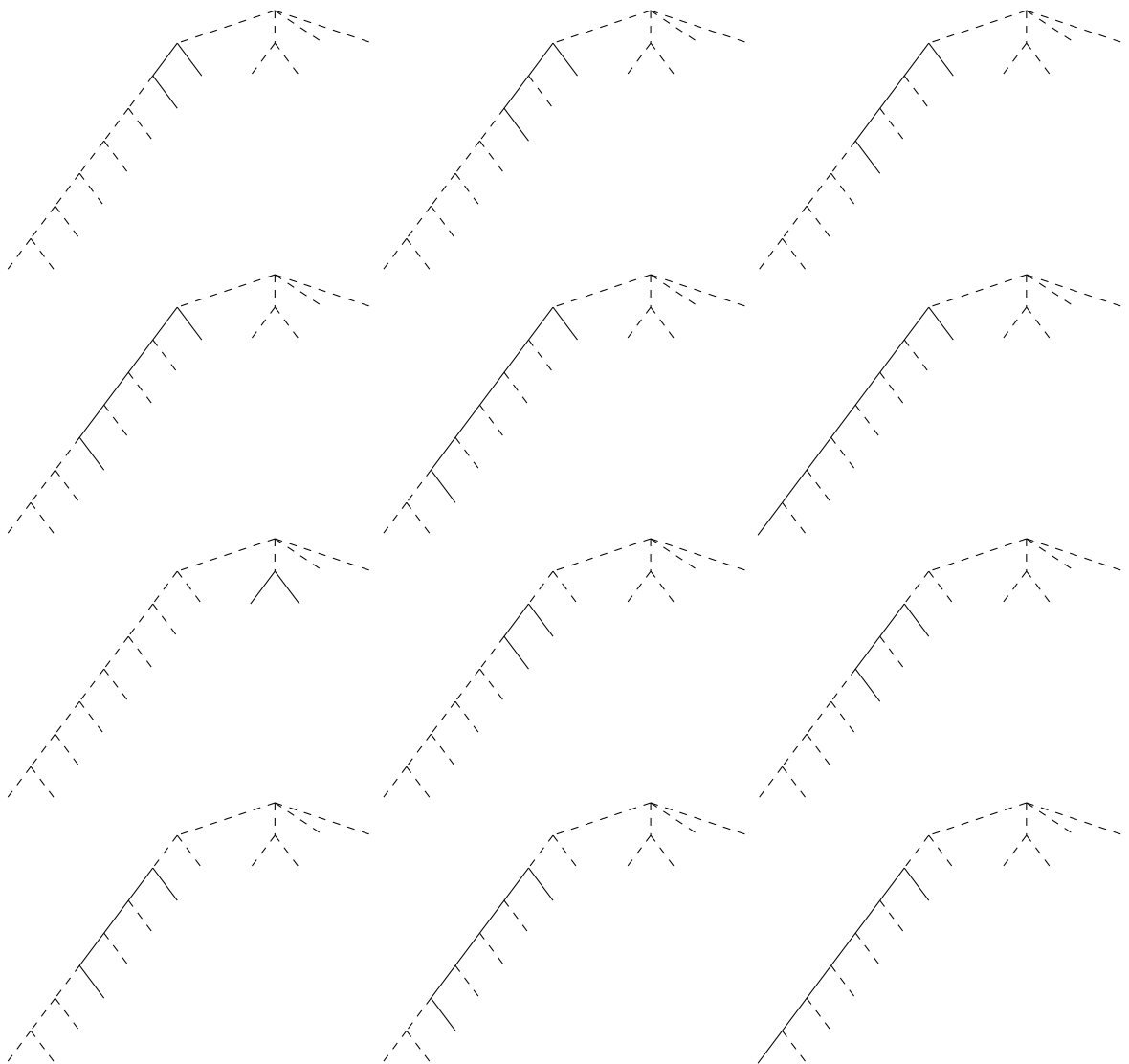


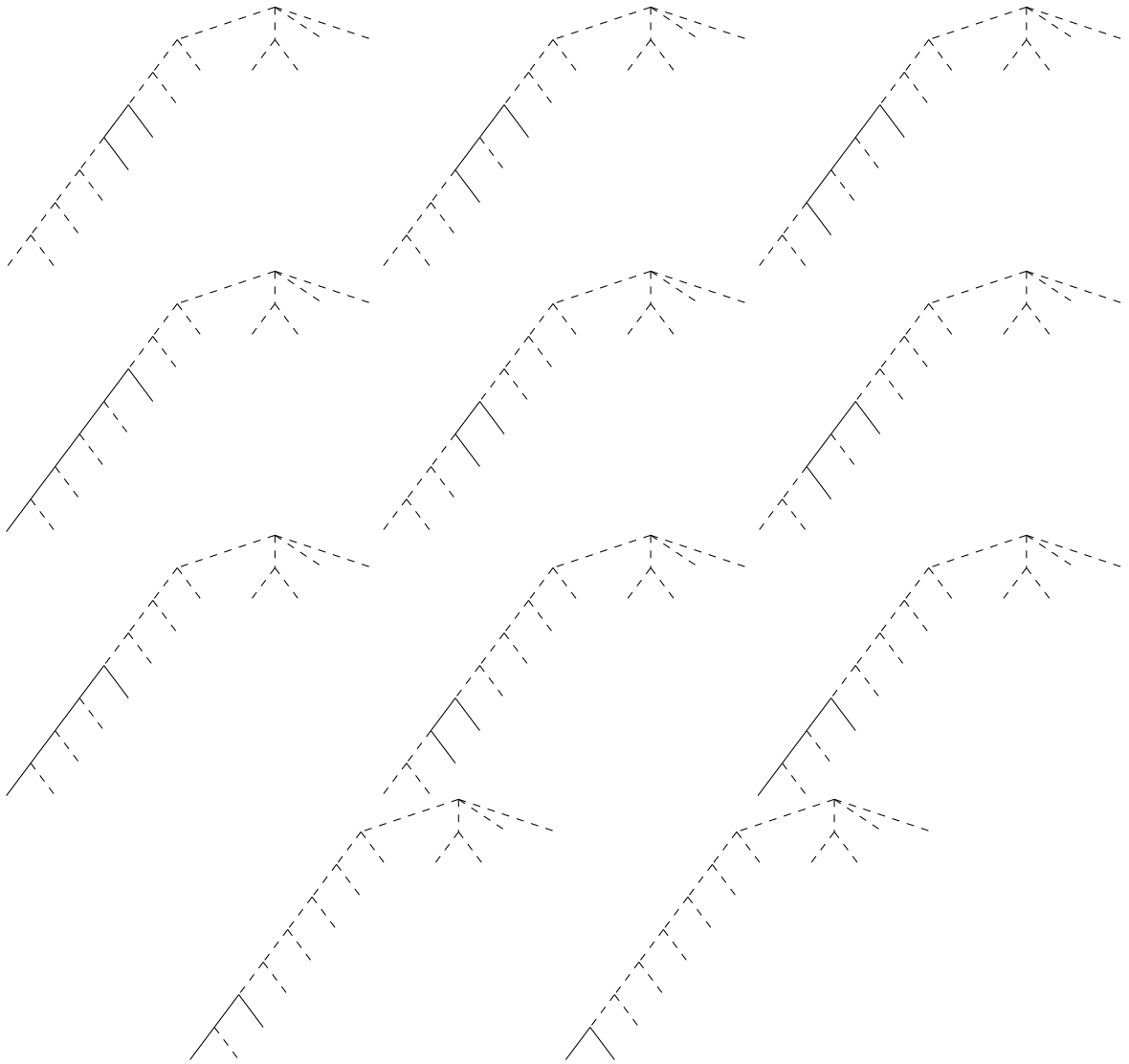
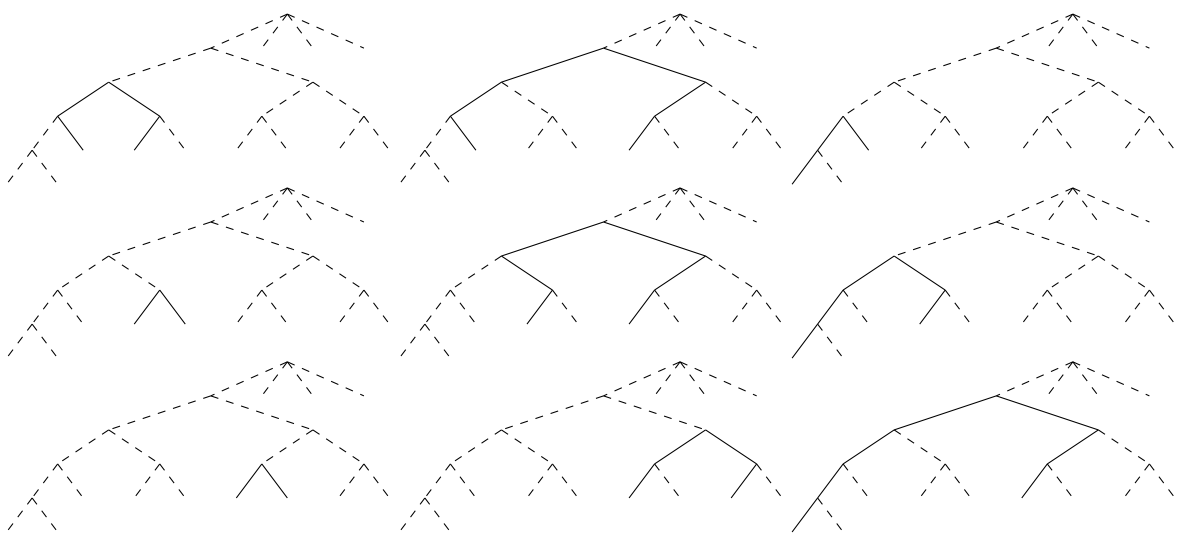
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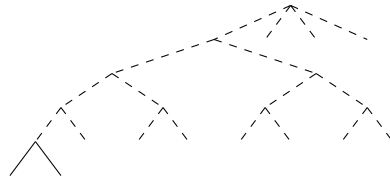
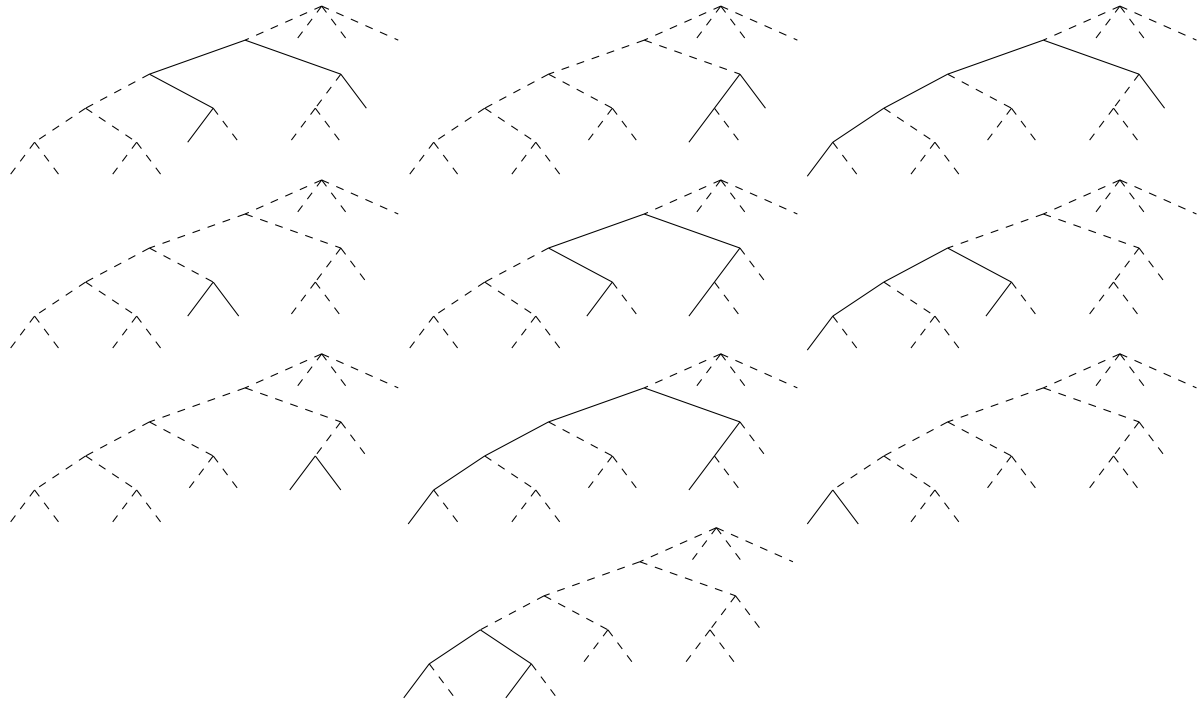
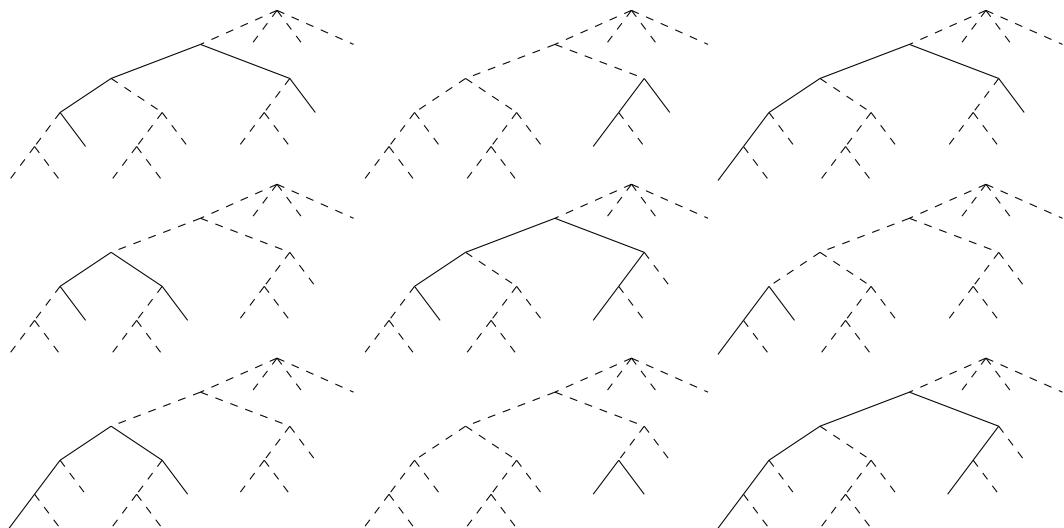
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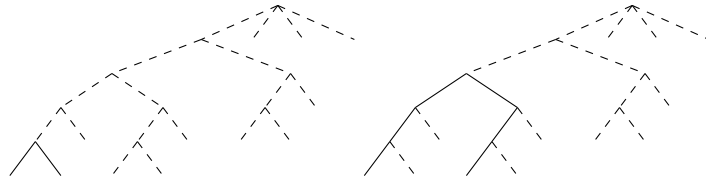
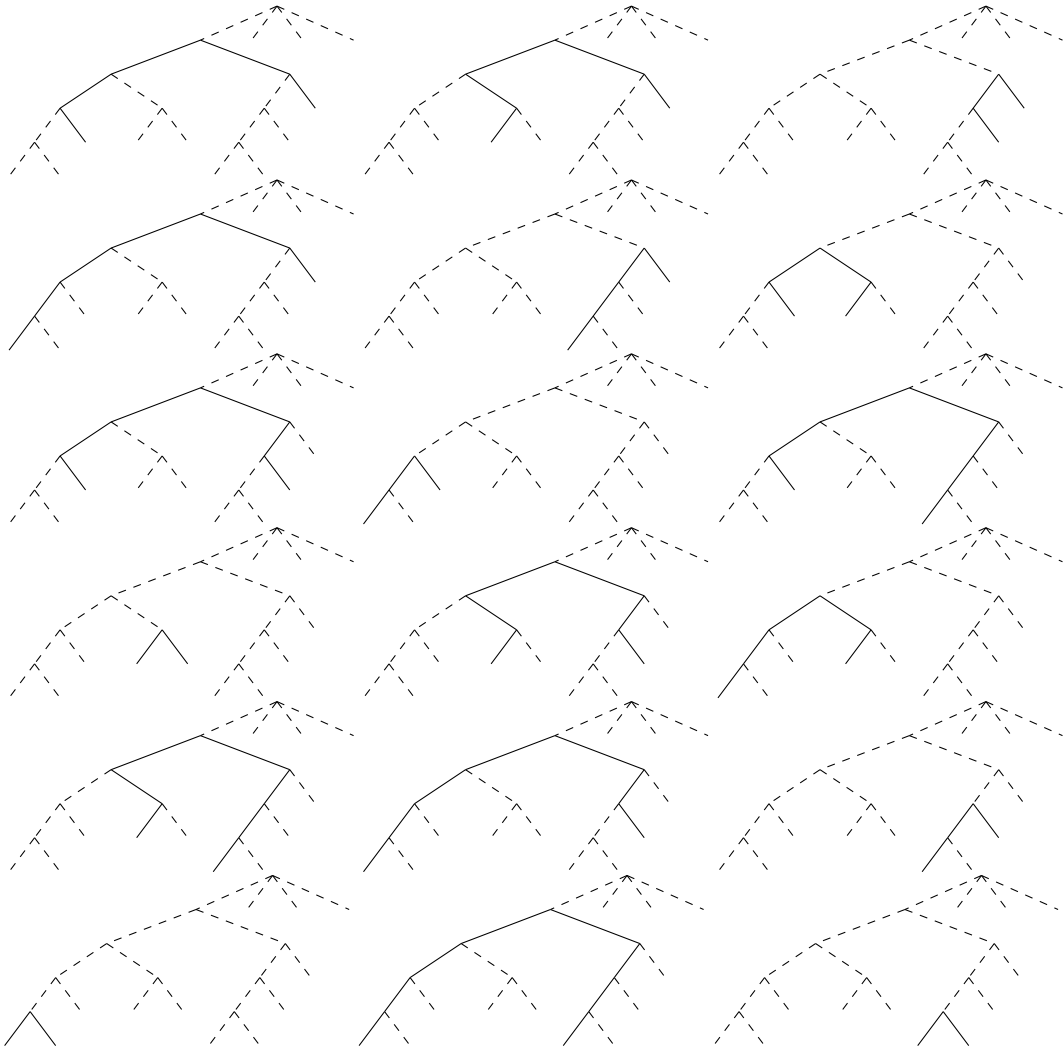
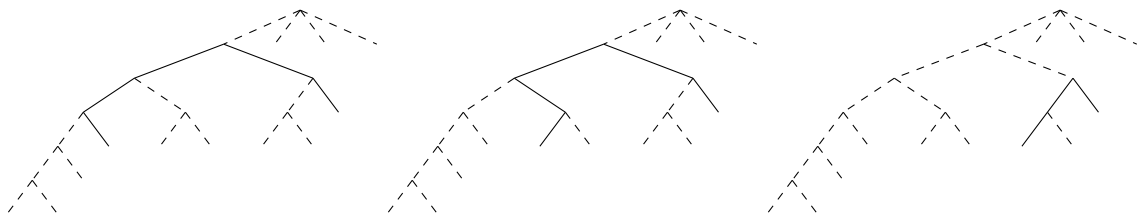
**Topology 491**

**Topology 492**

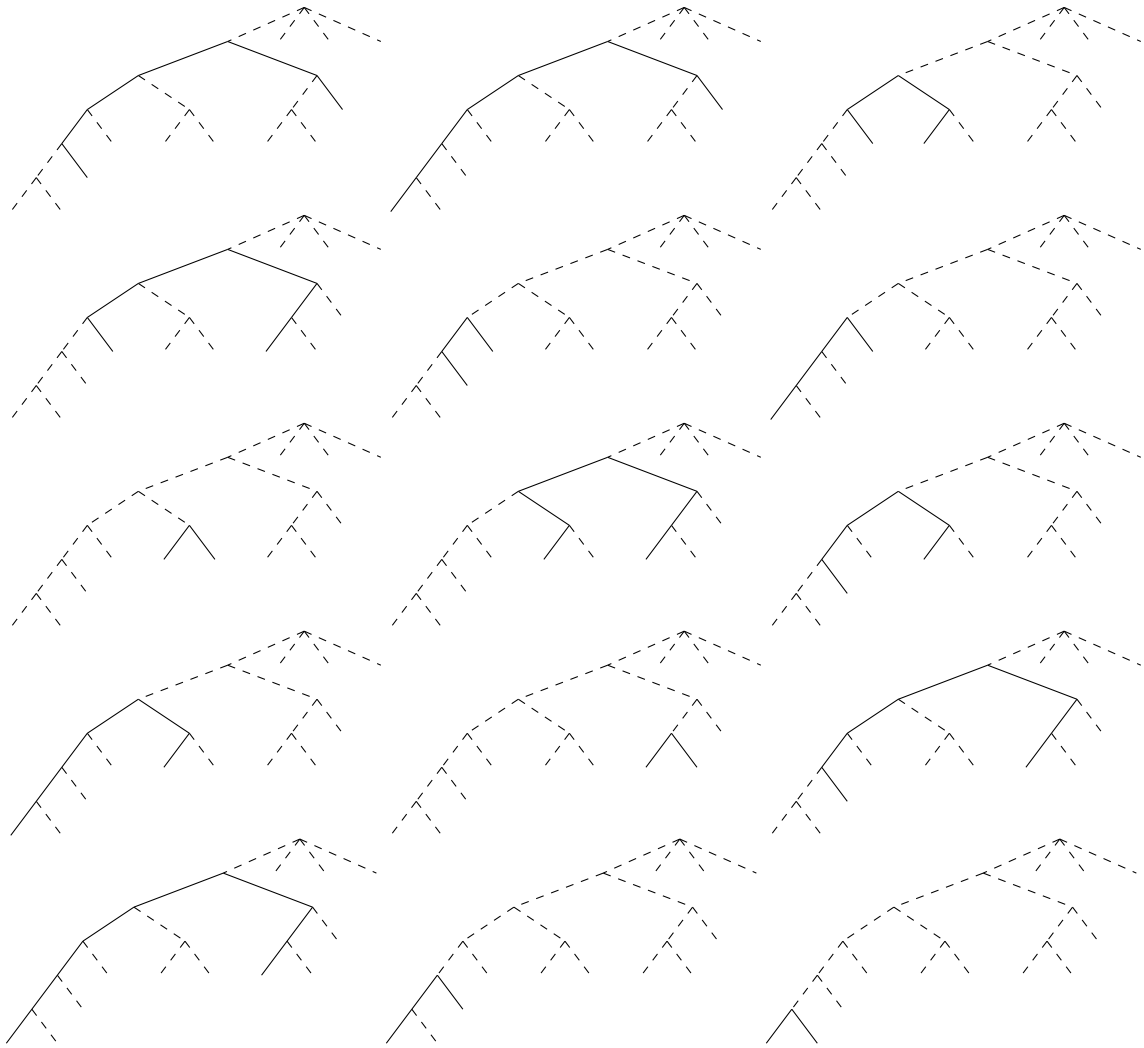
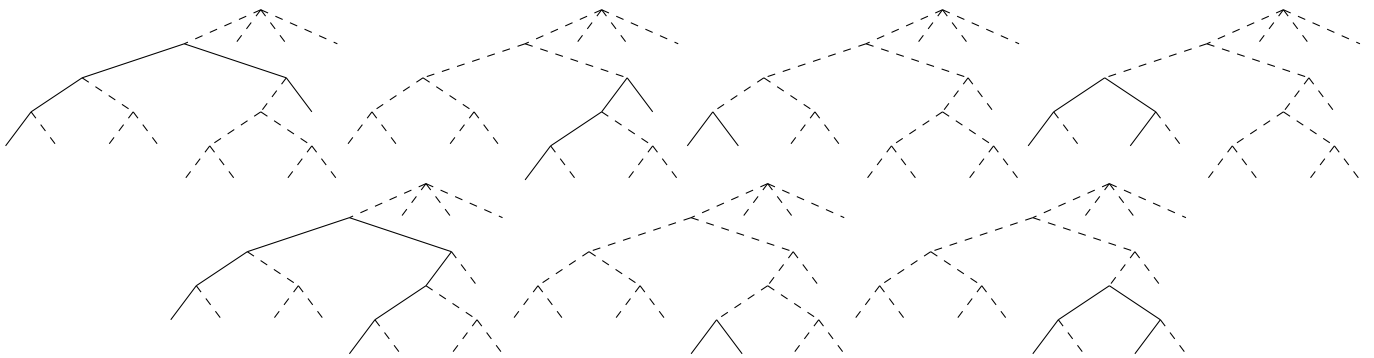
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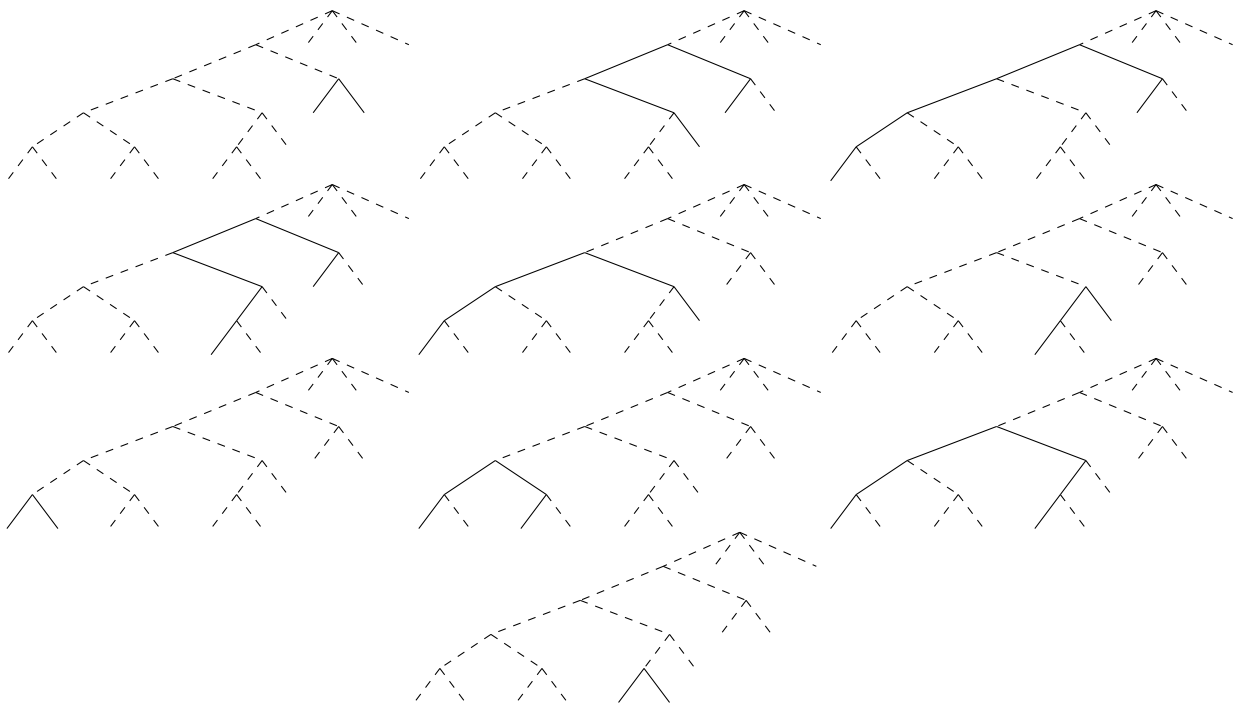
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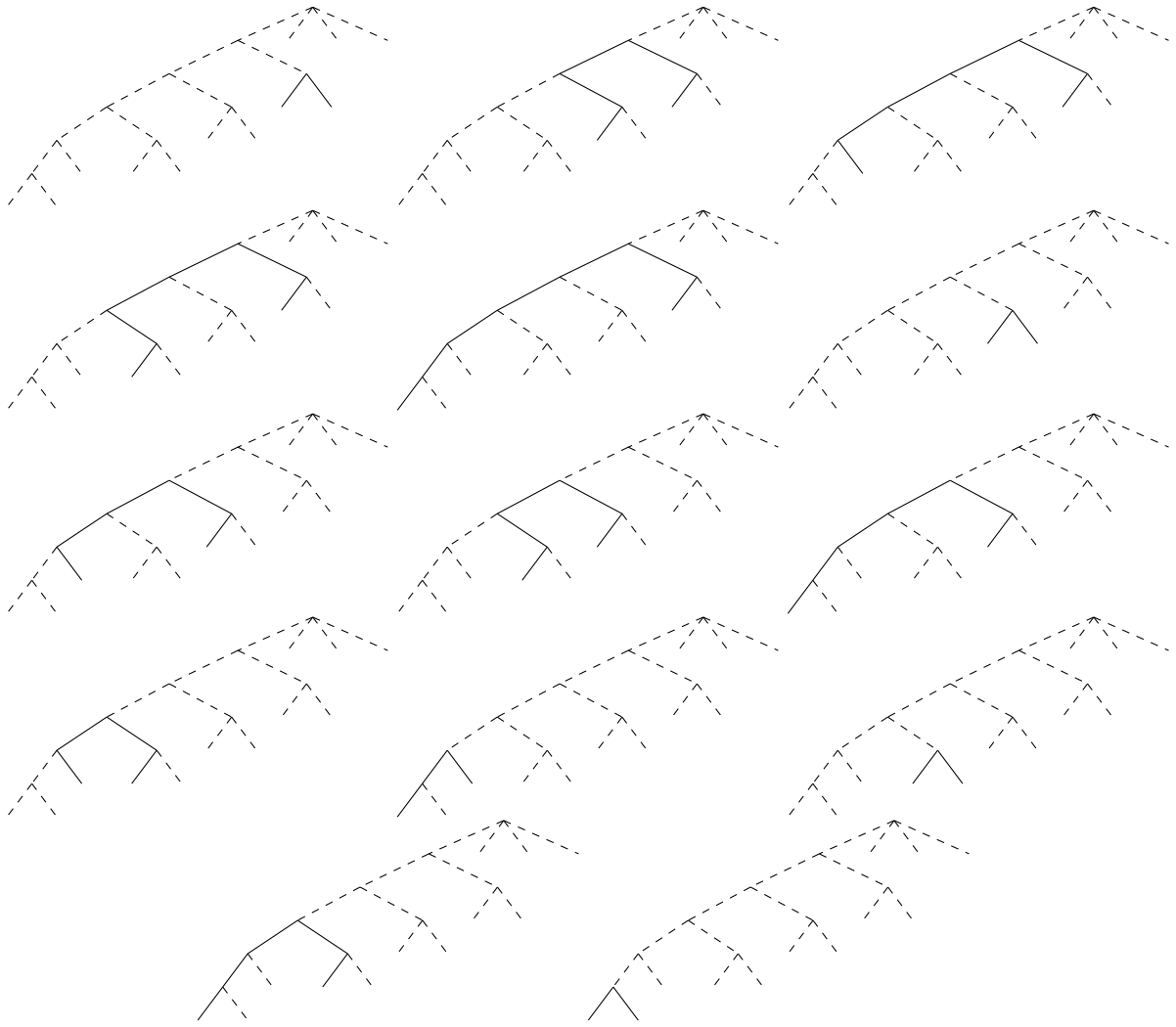
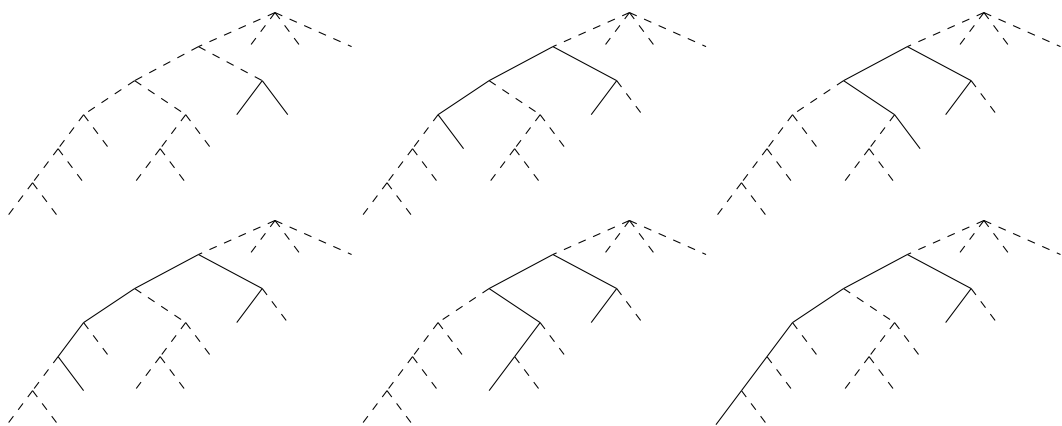
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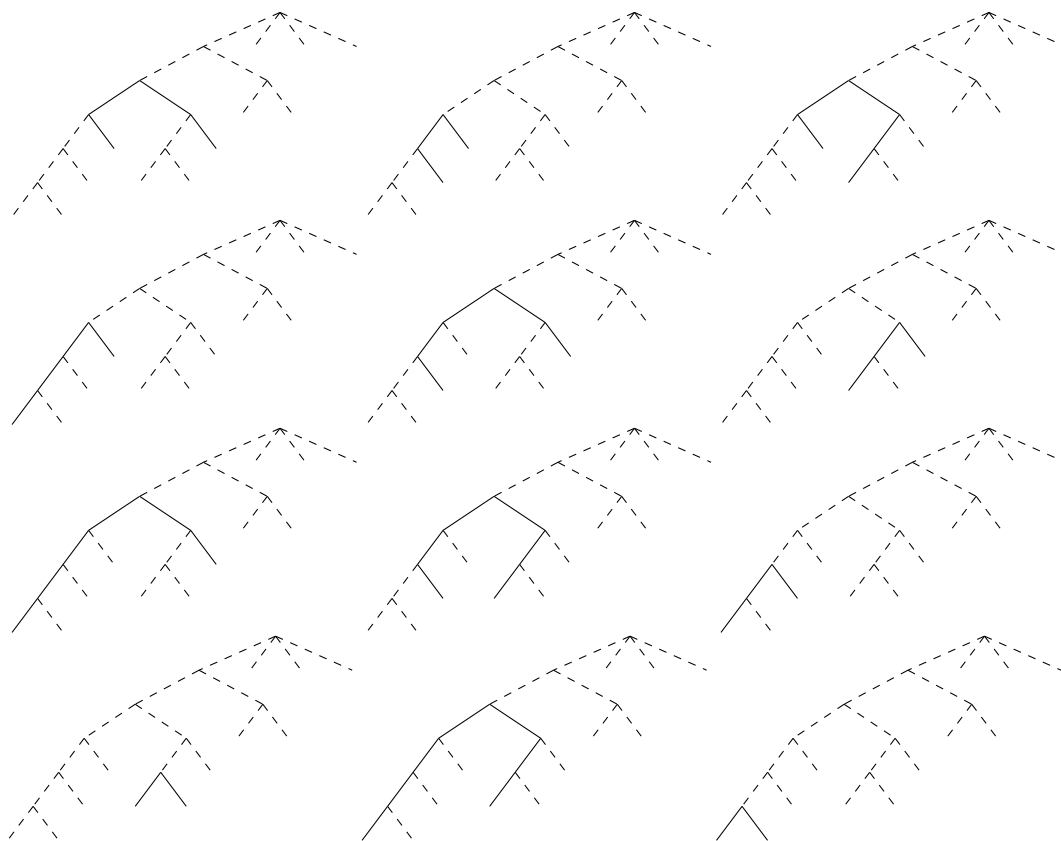
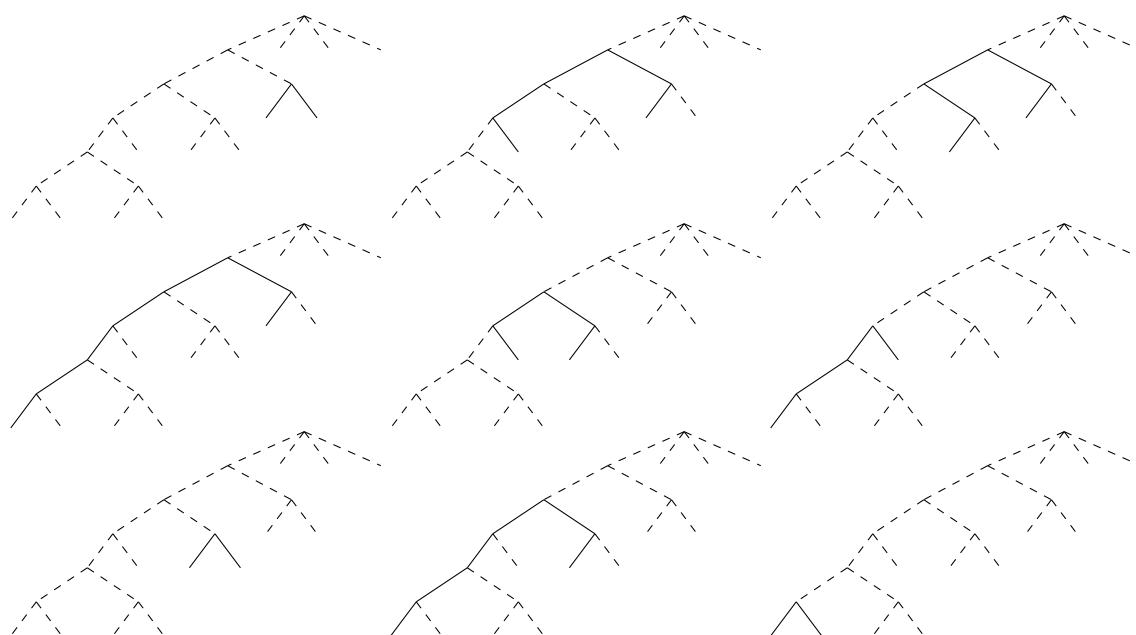
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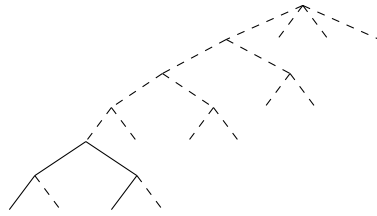


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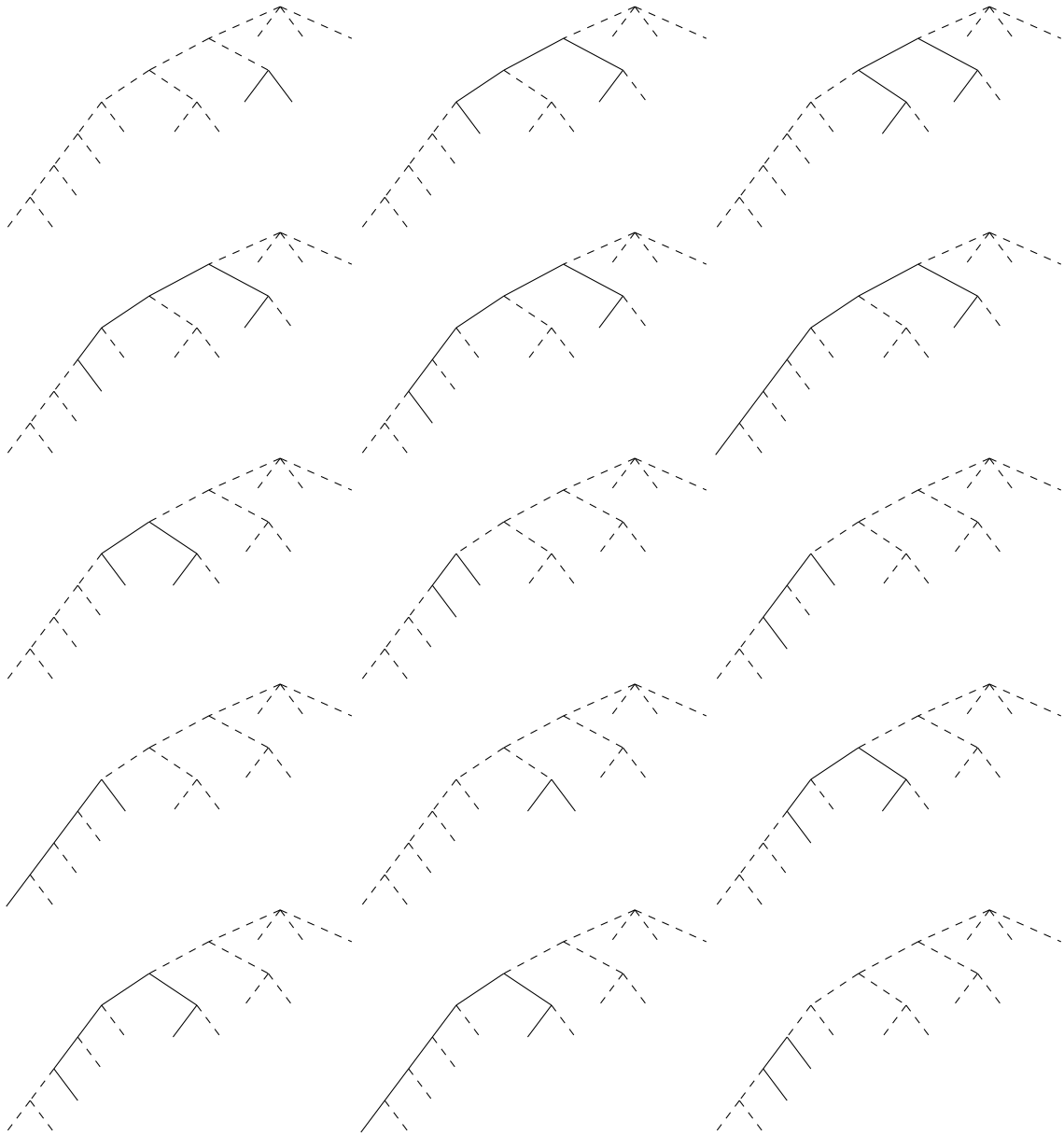
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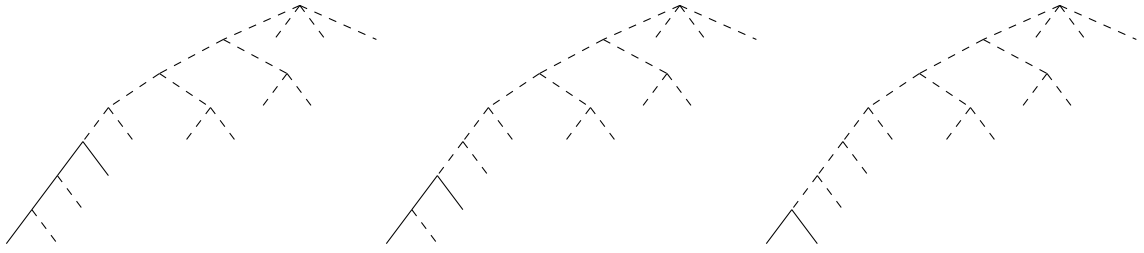
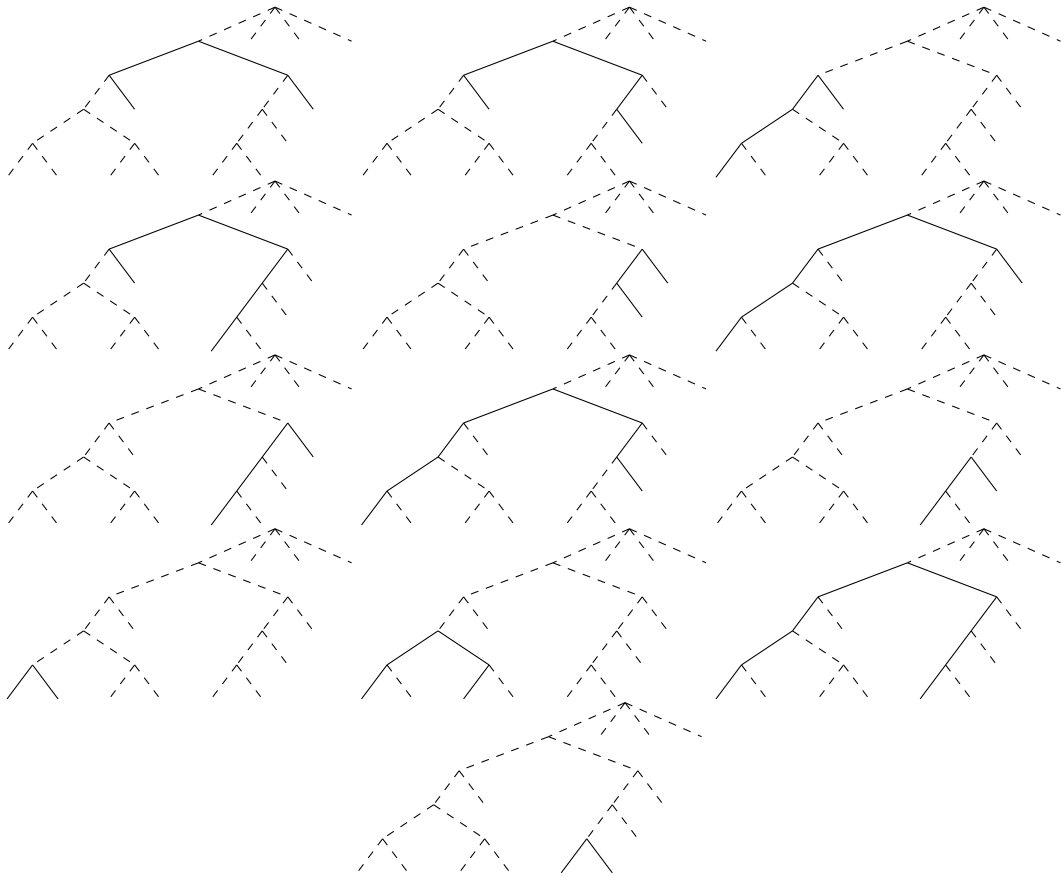
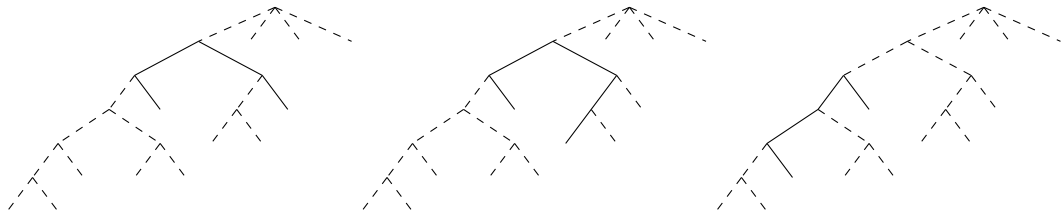
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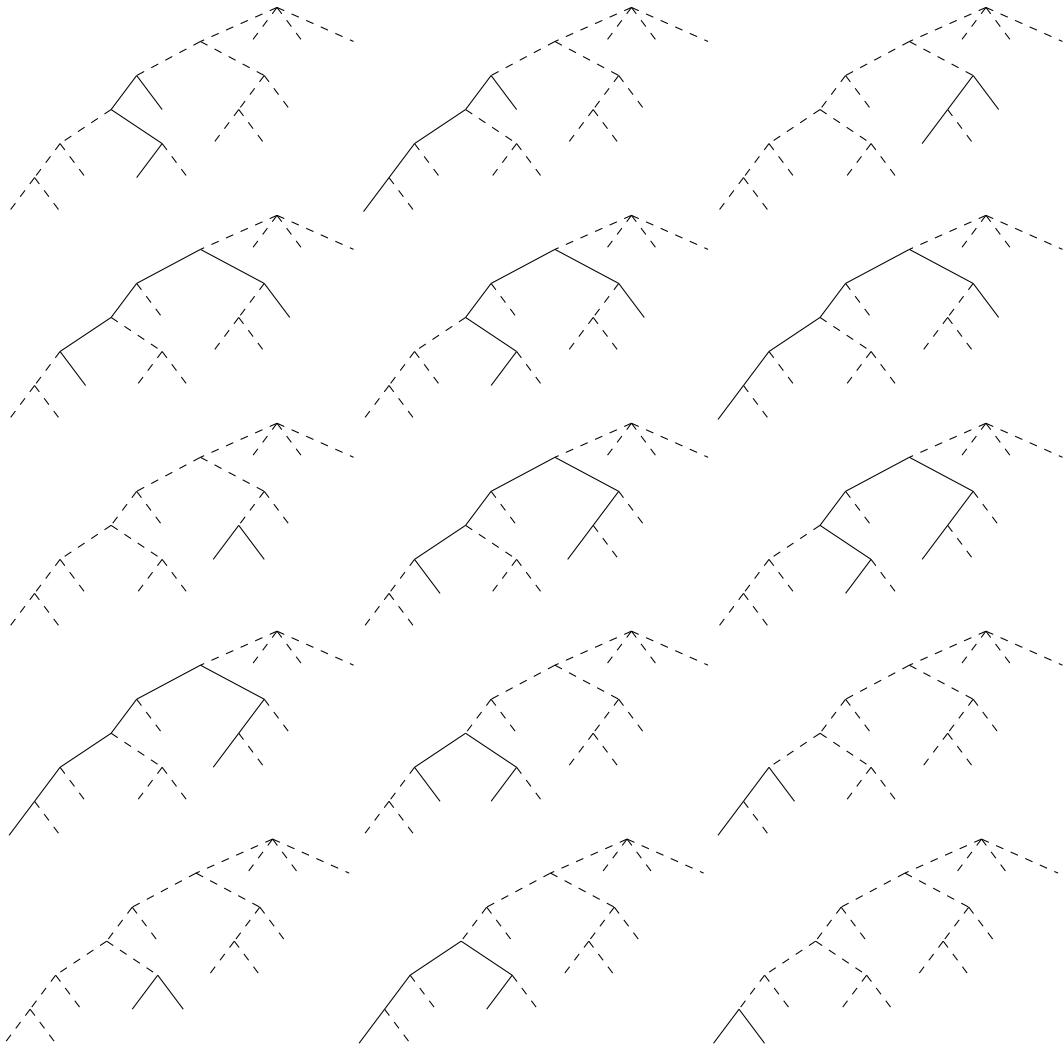
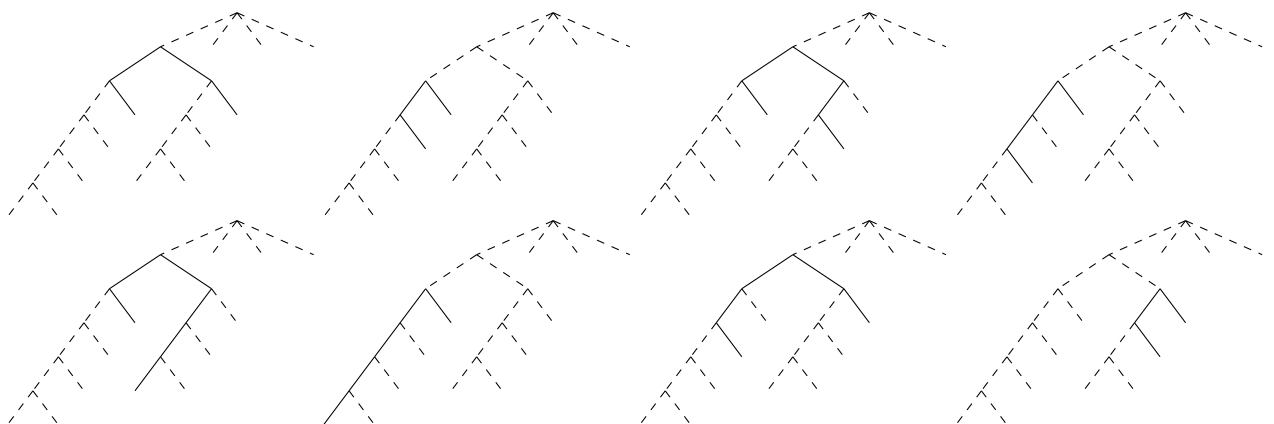
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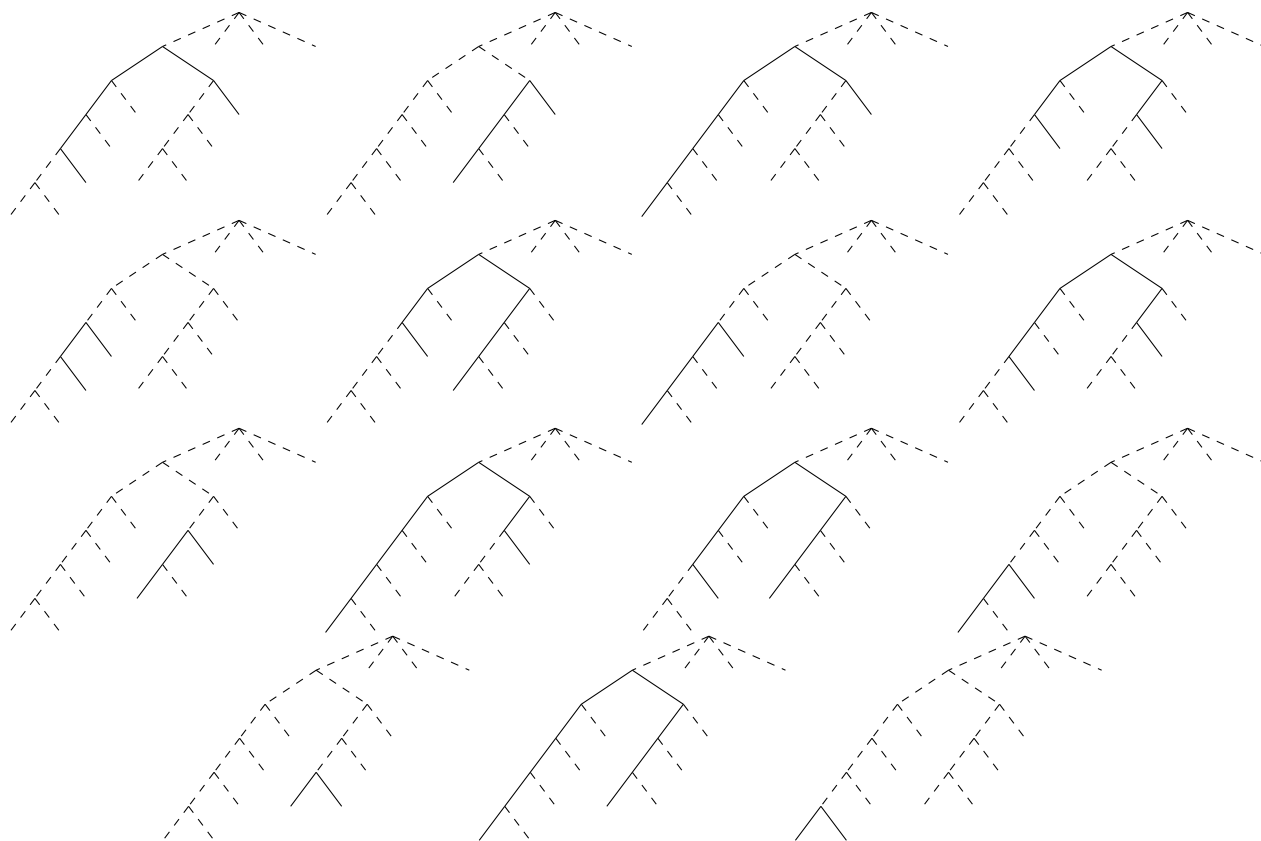
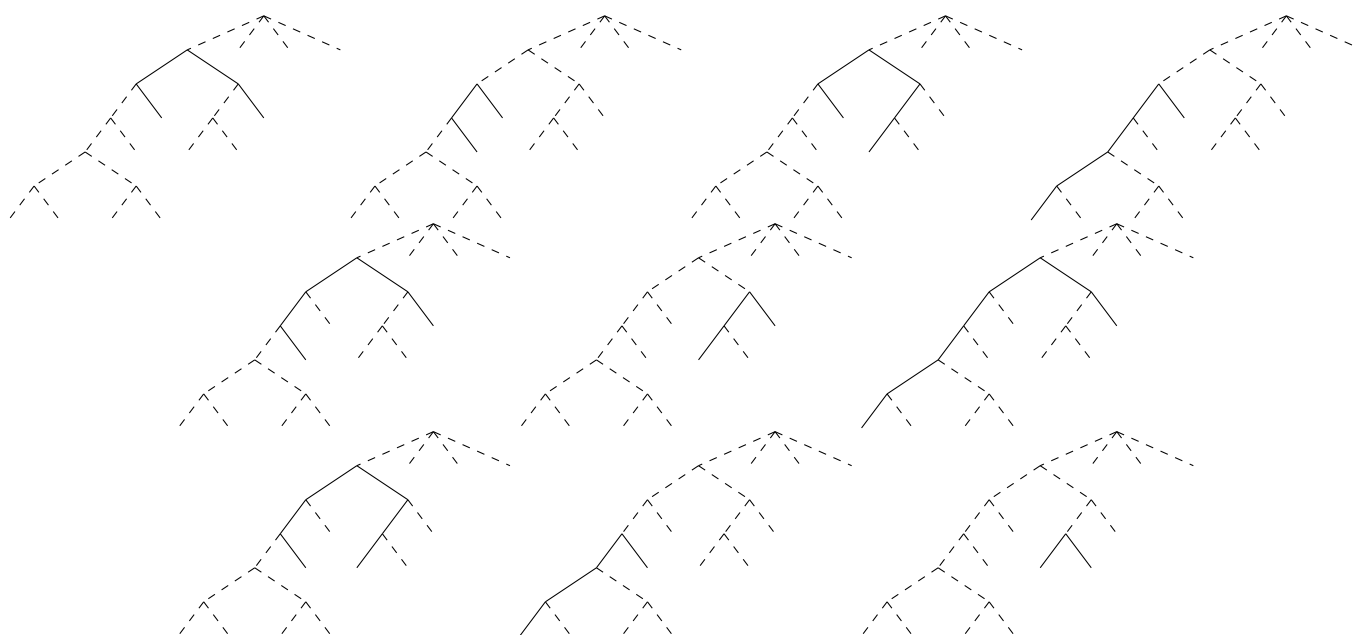


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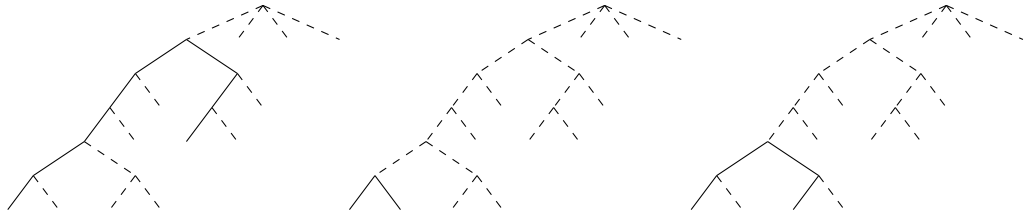


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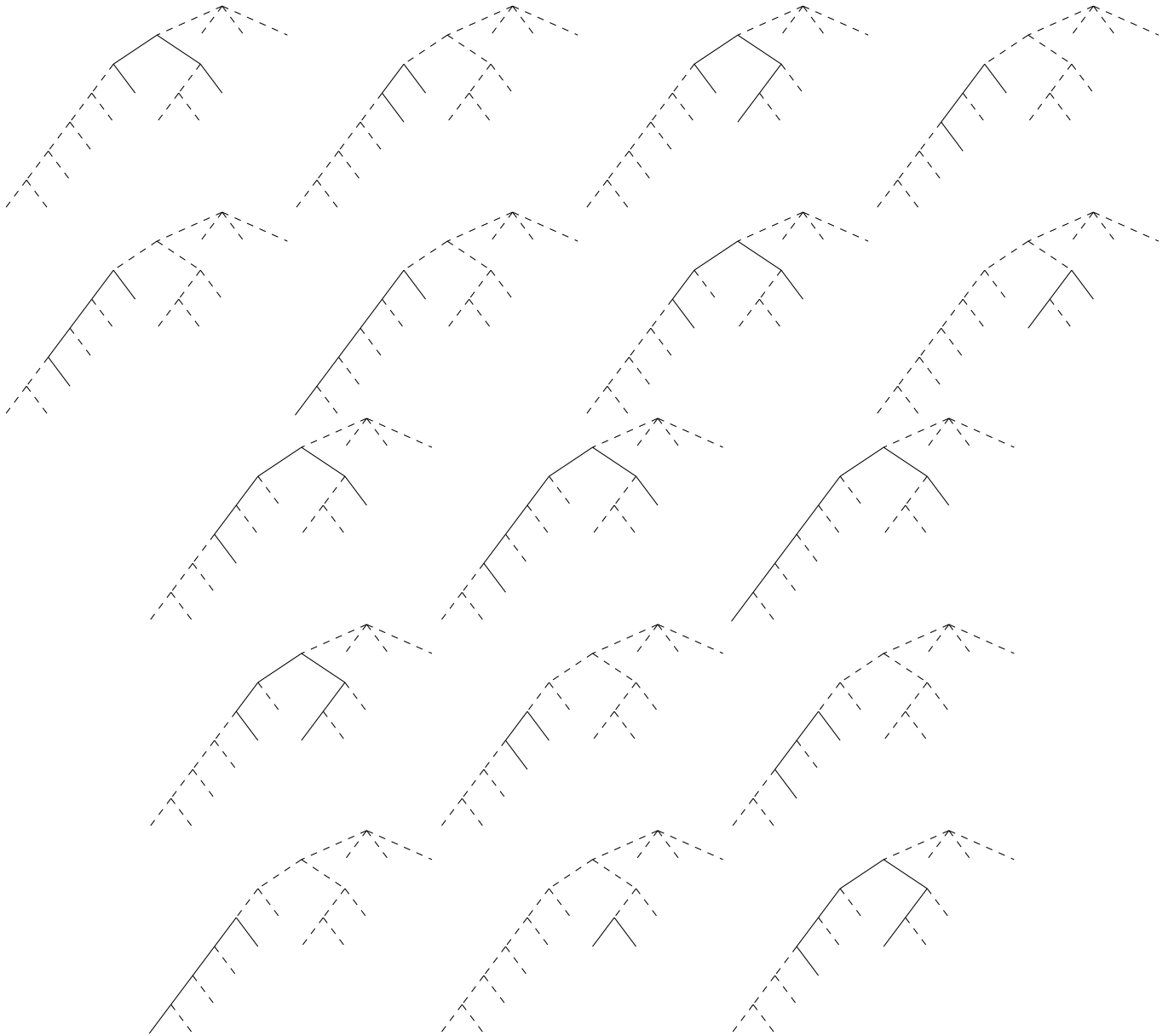
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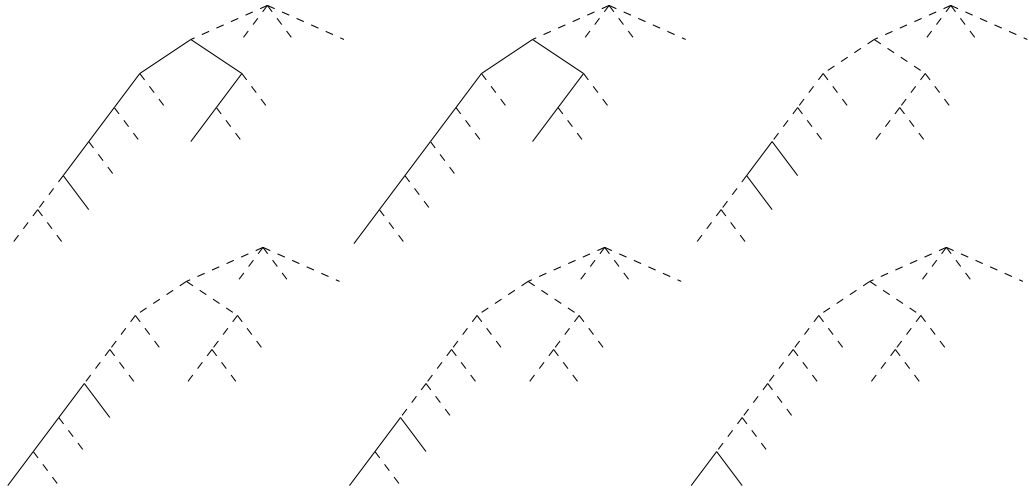
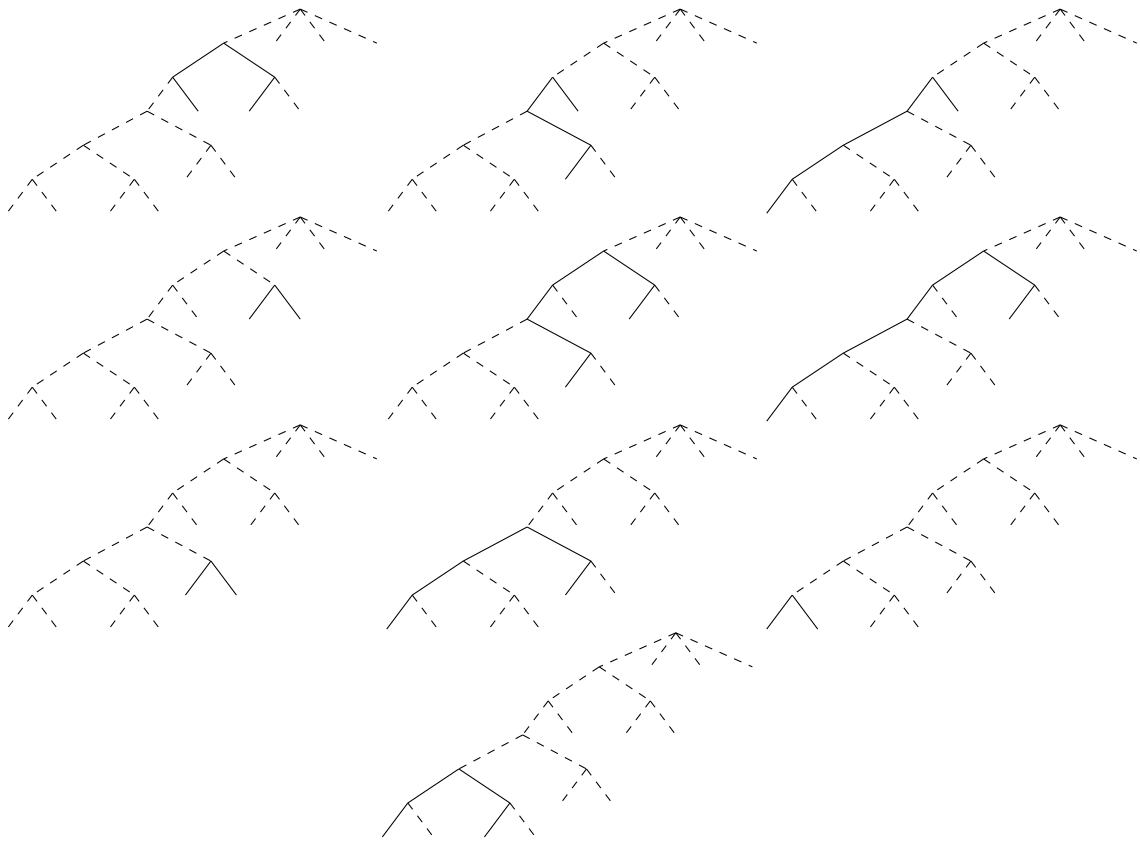
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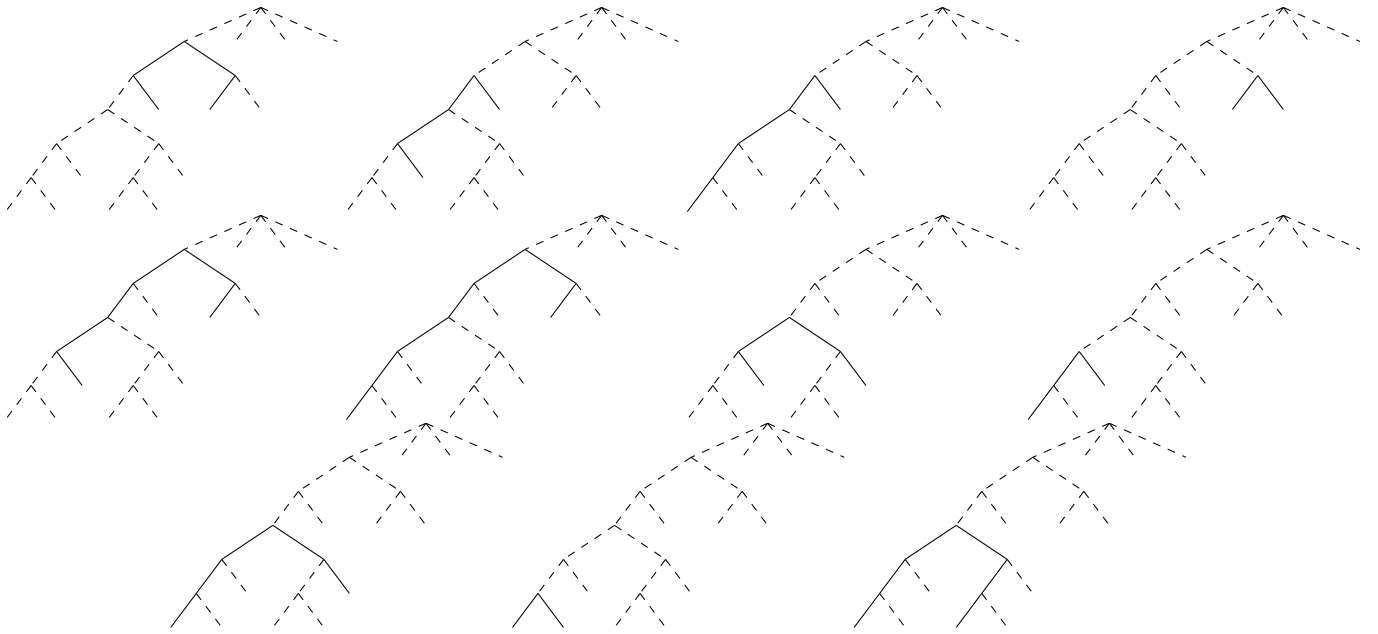




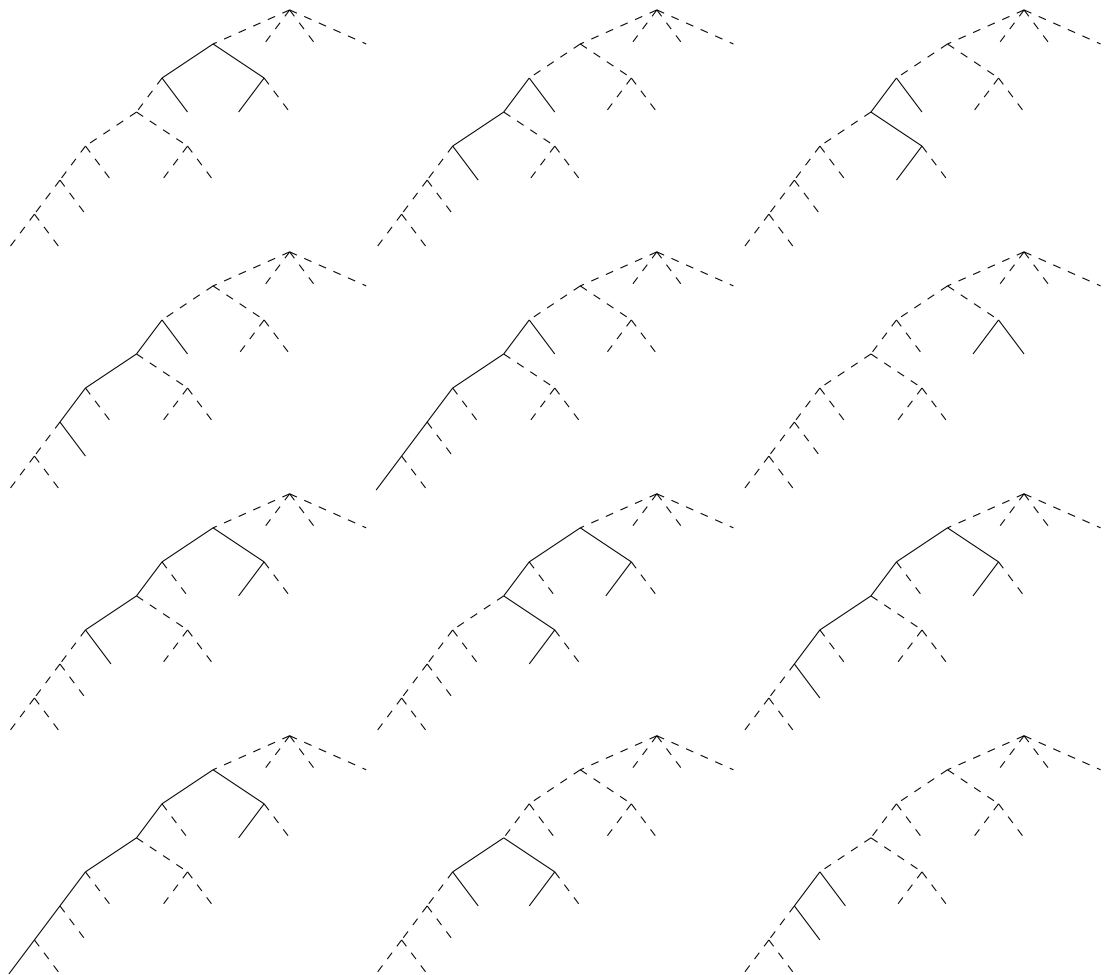
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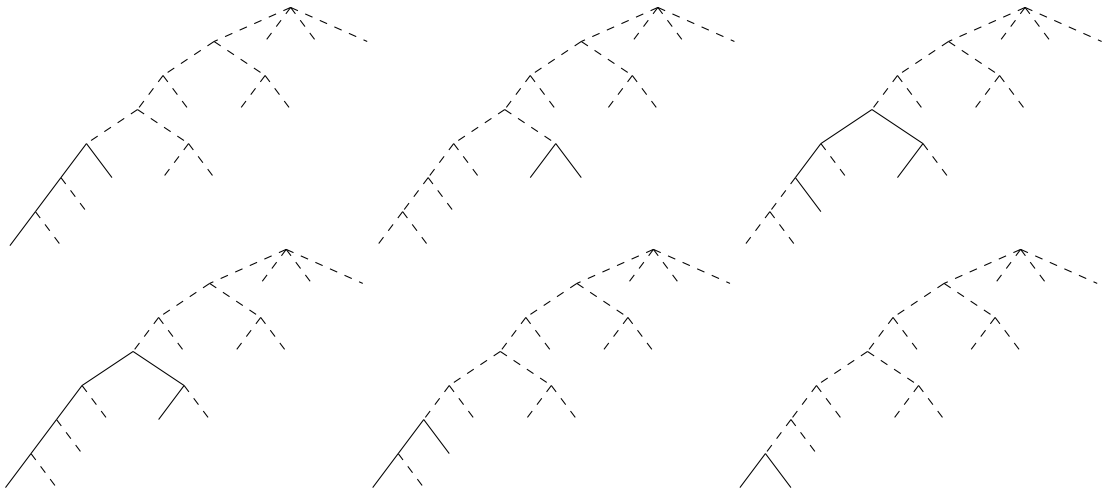
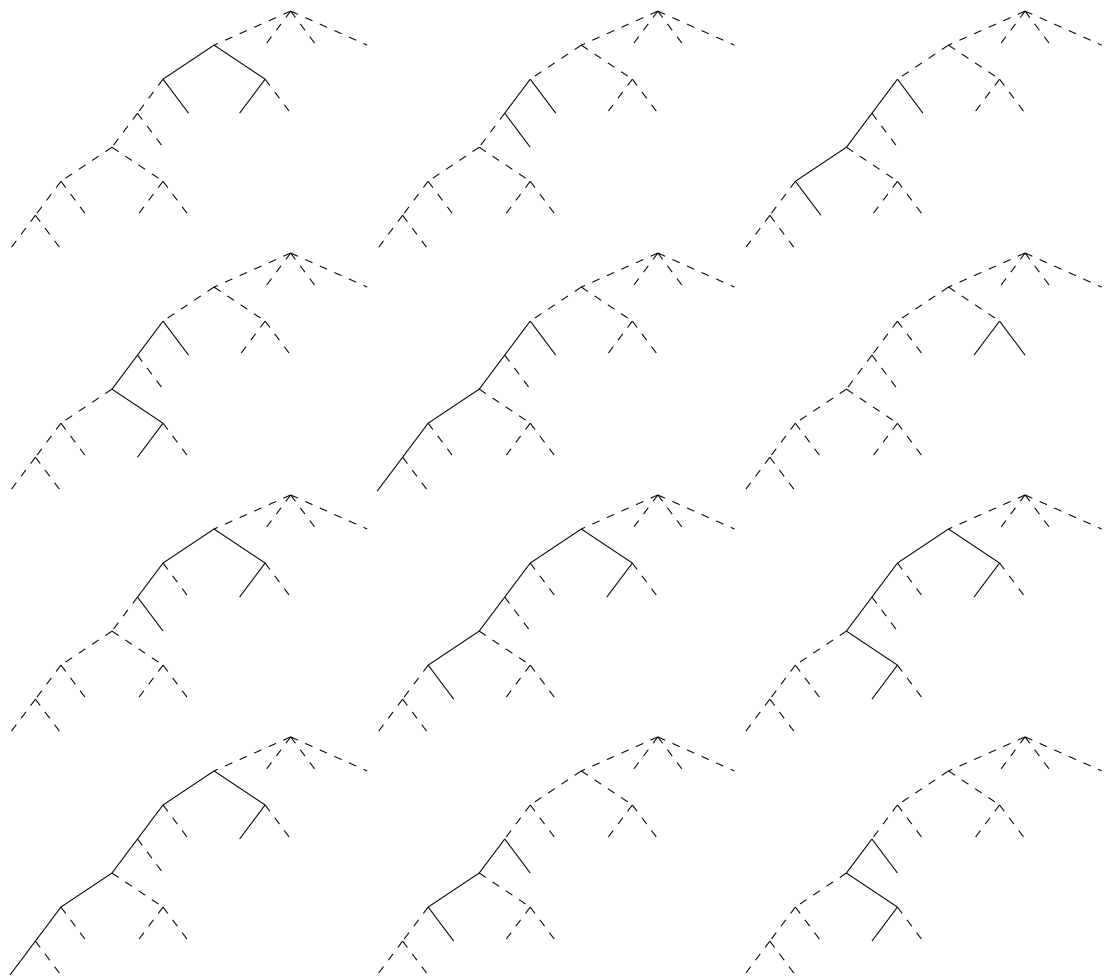


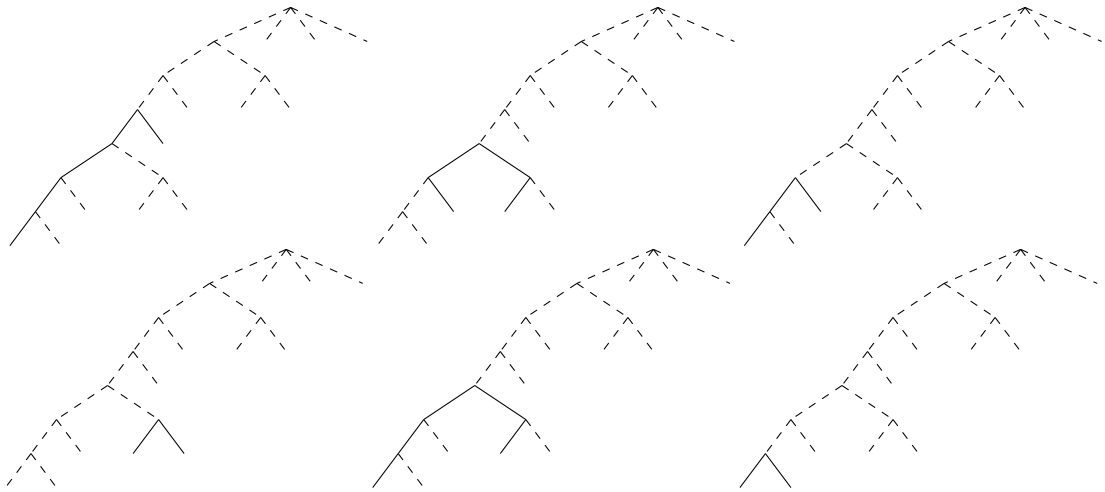
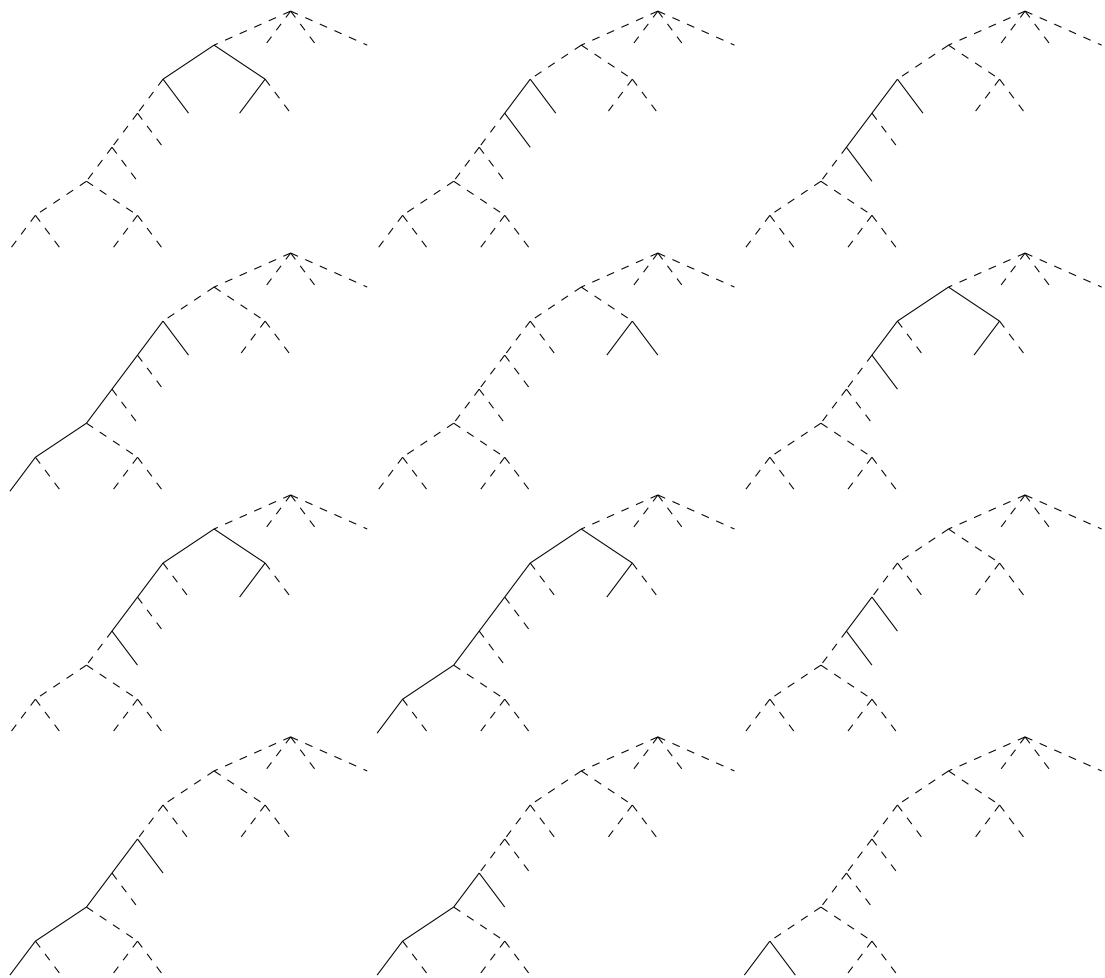
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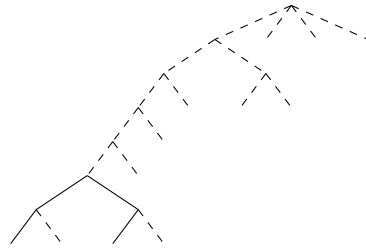
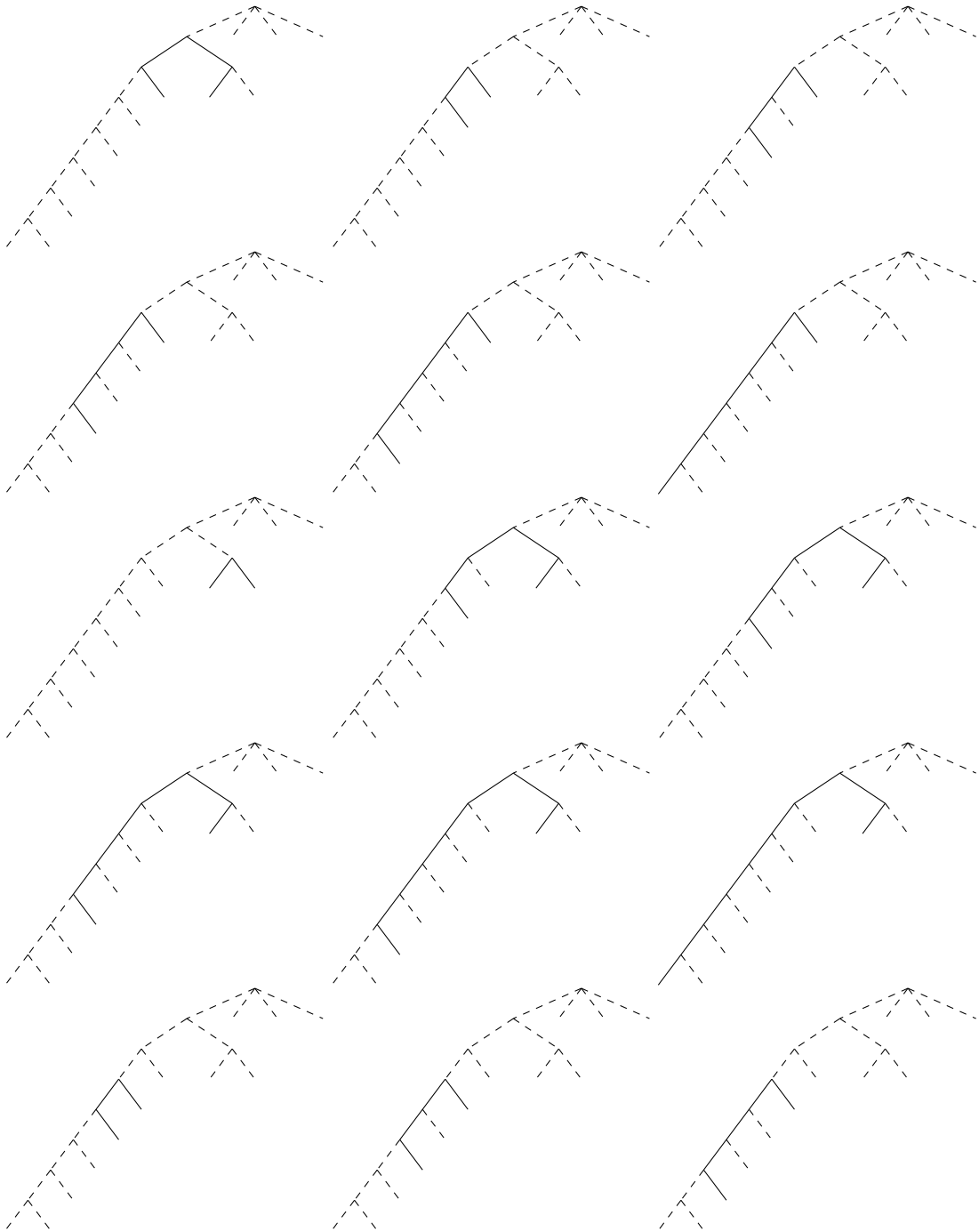


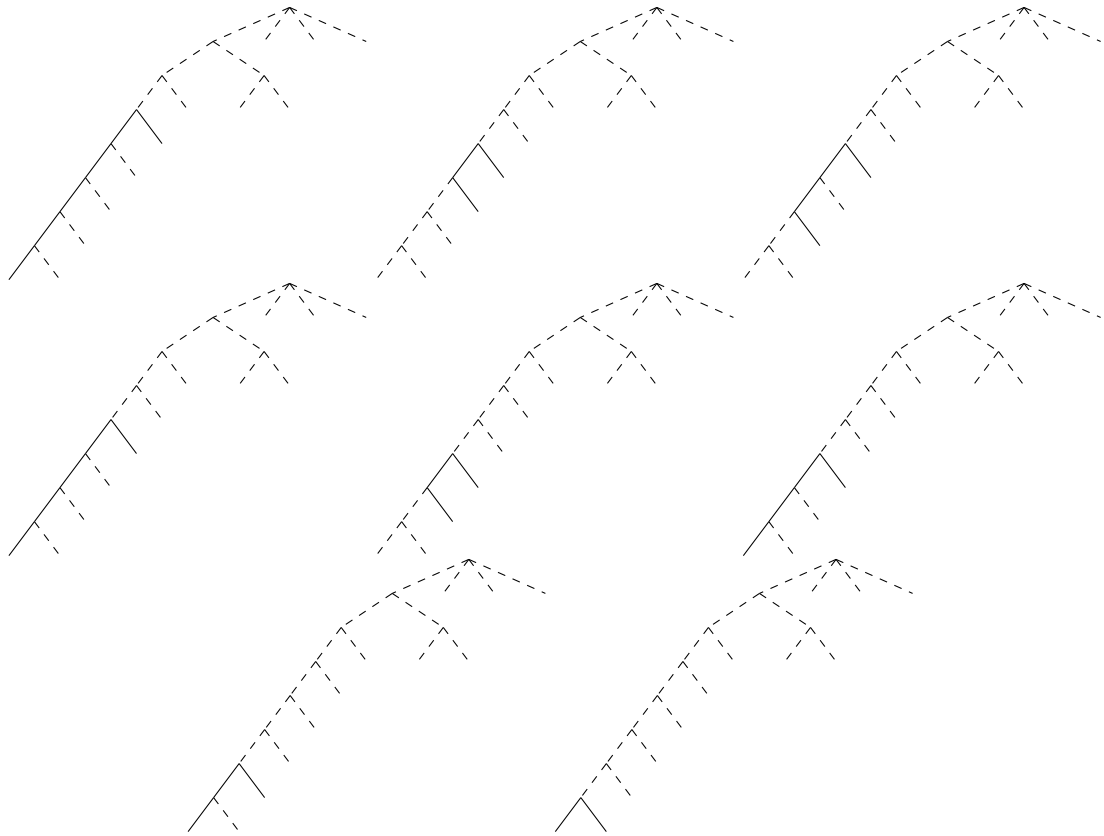
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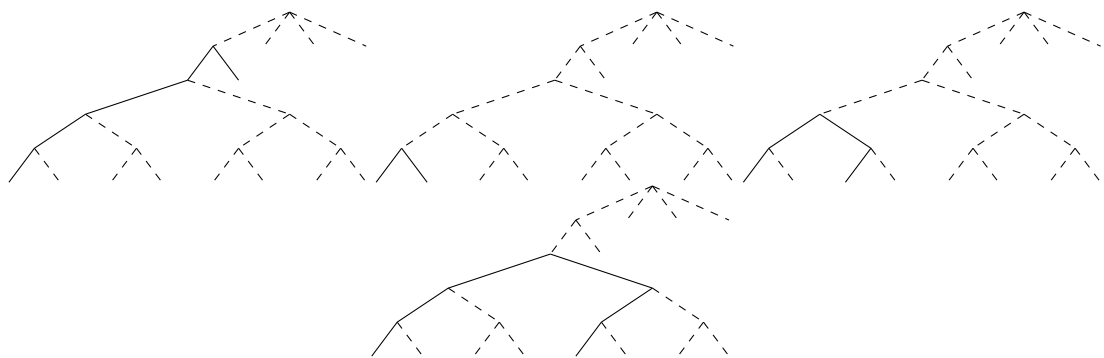
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**Topology 515**

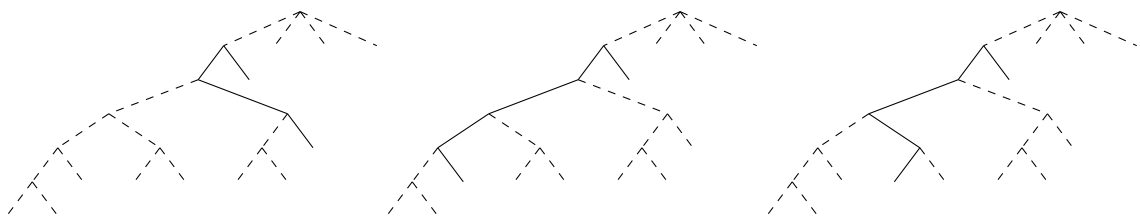
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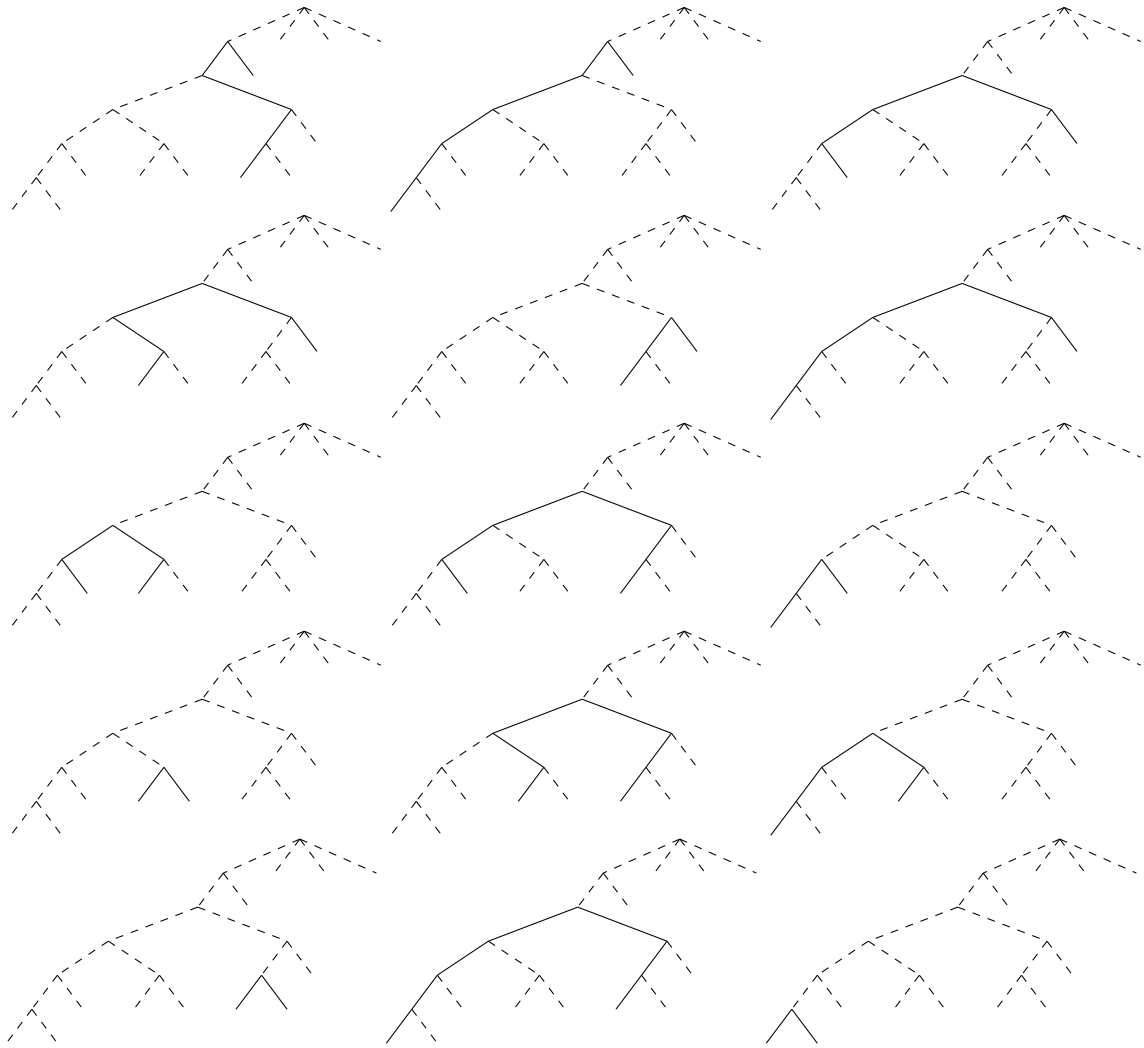


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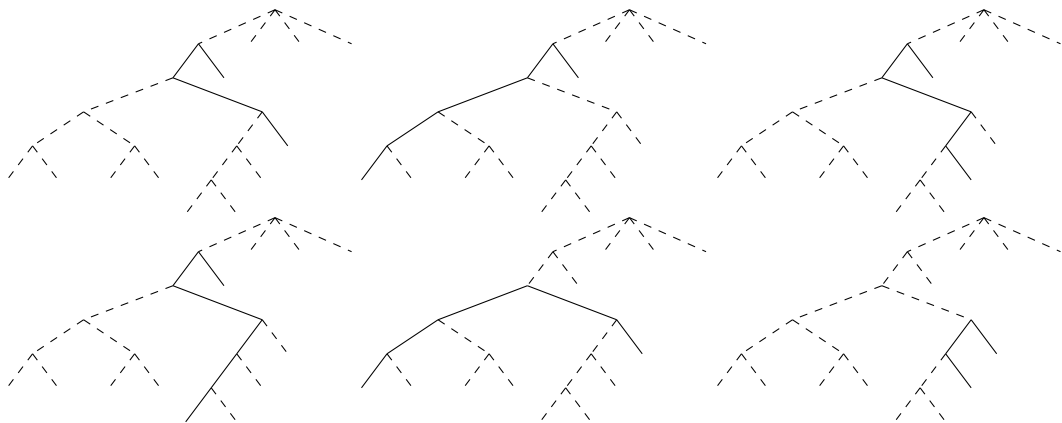


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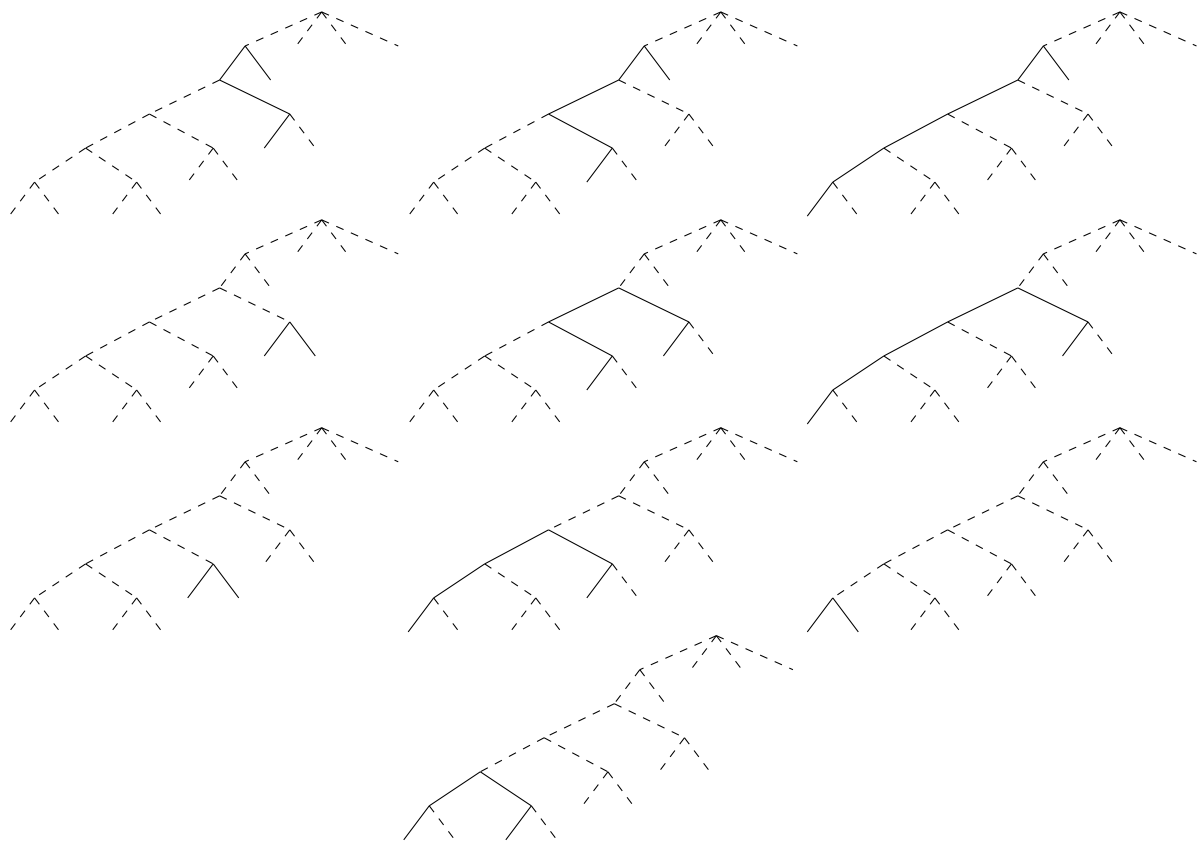
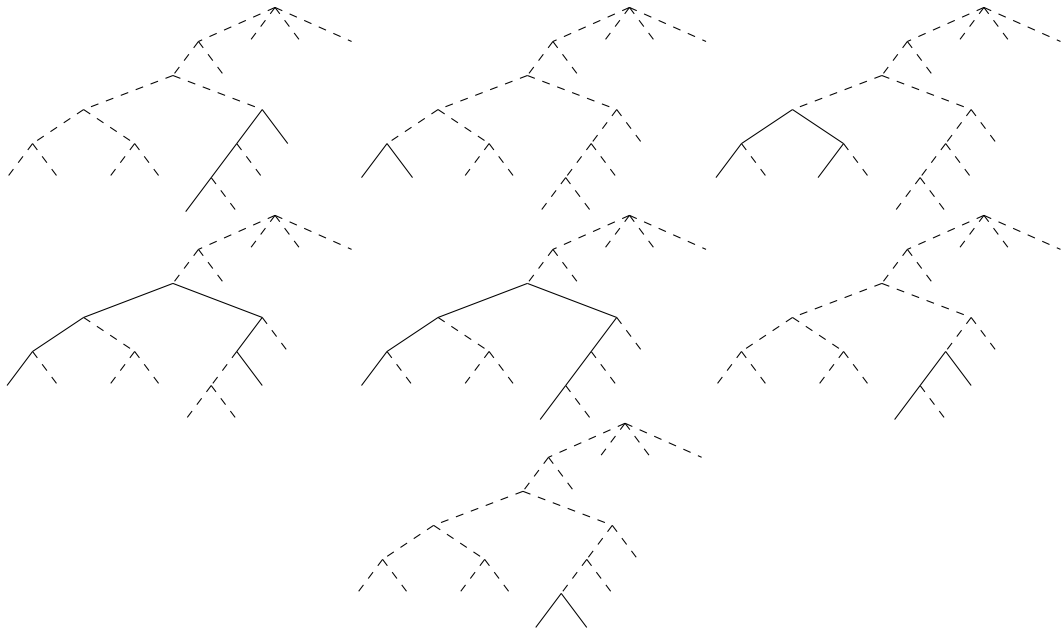


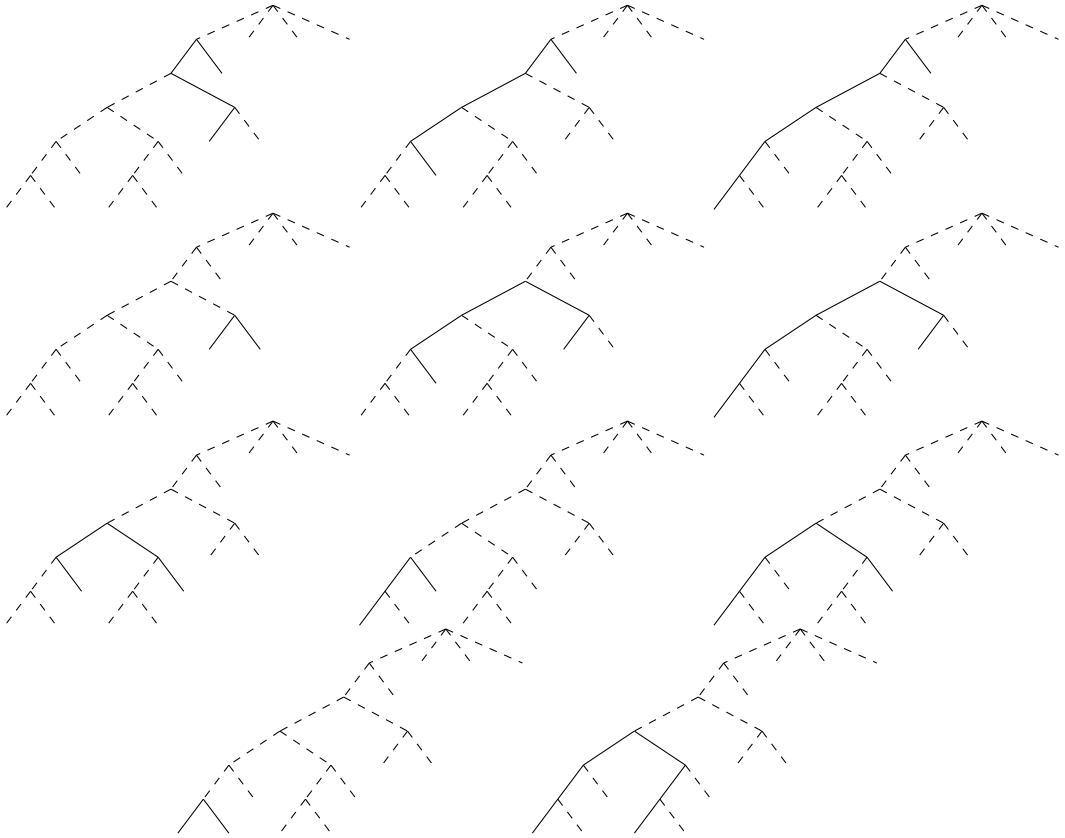
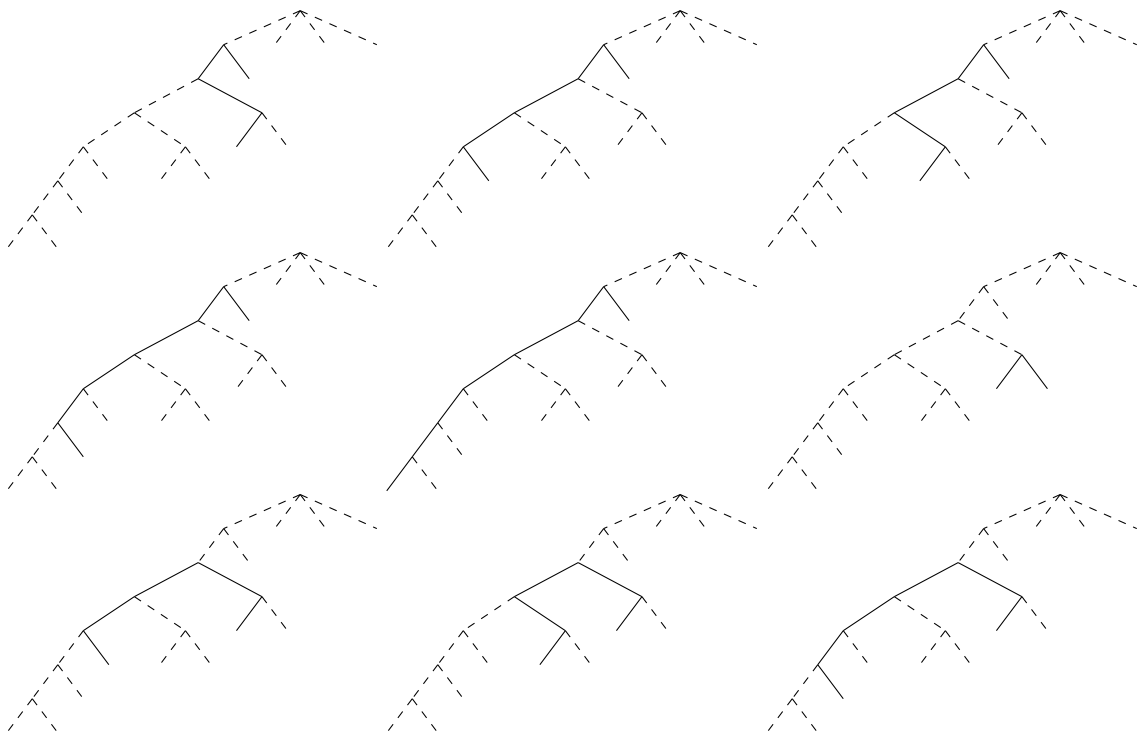


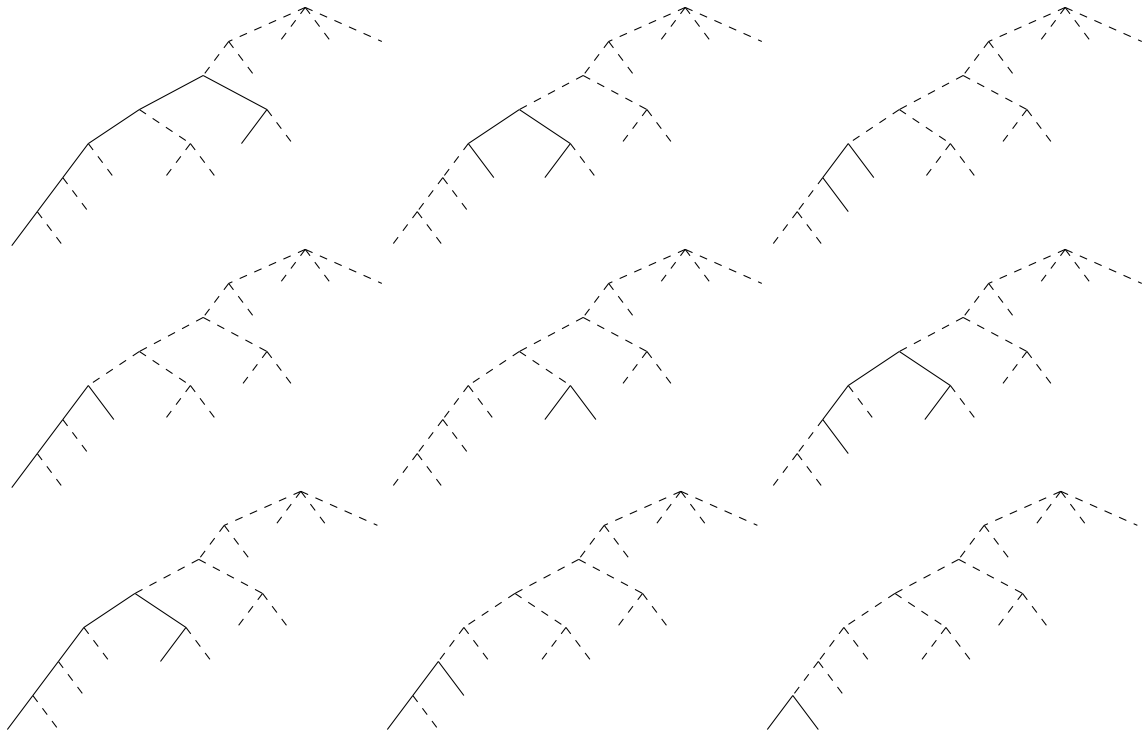
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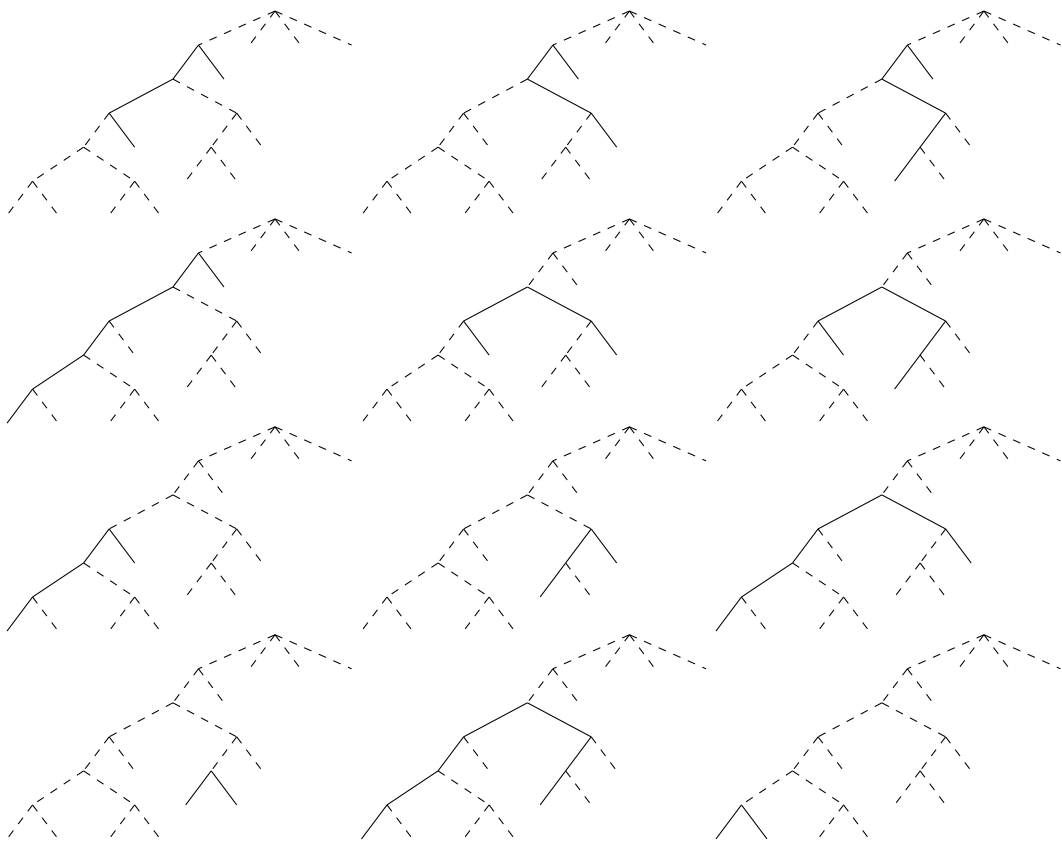


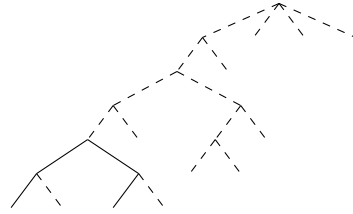
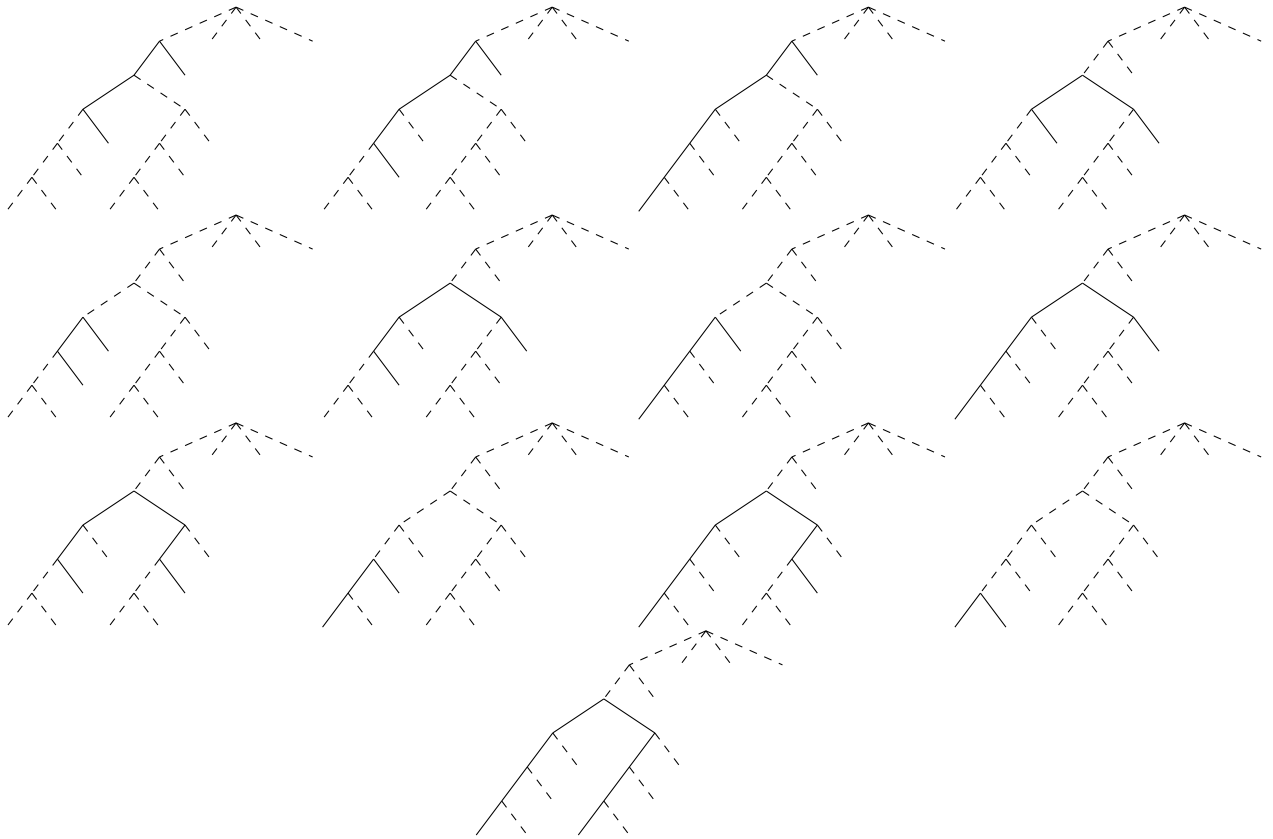
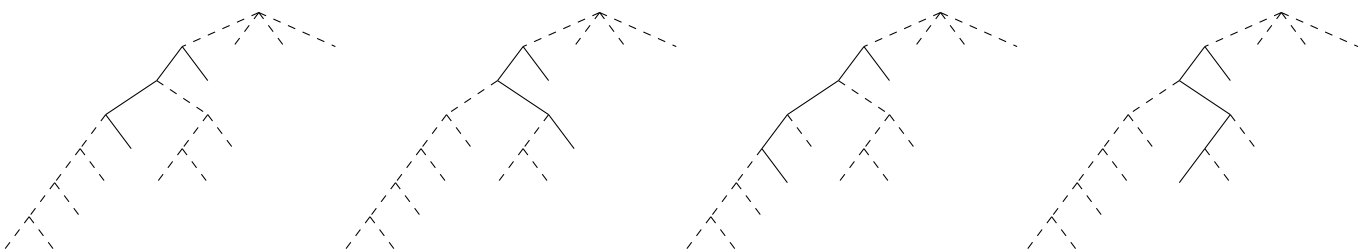


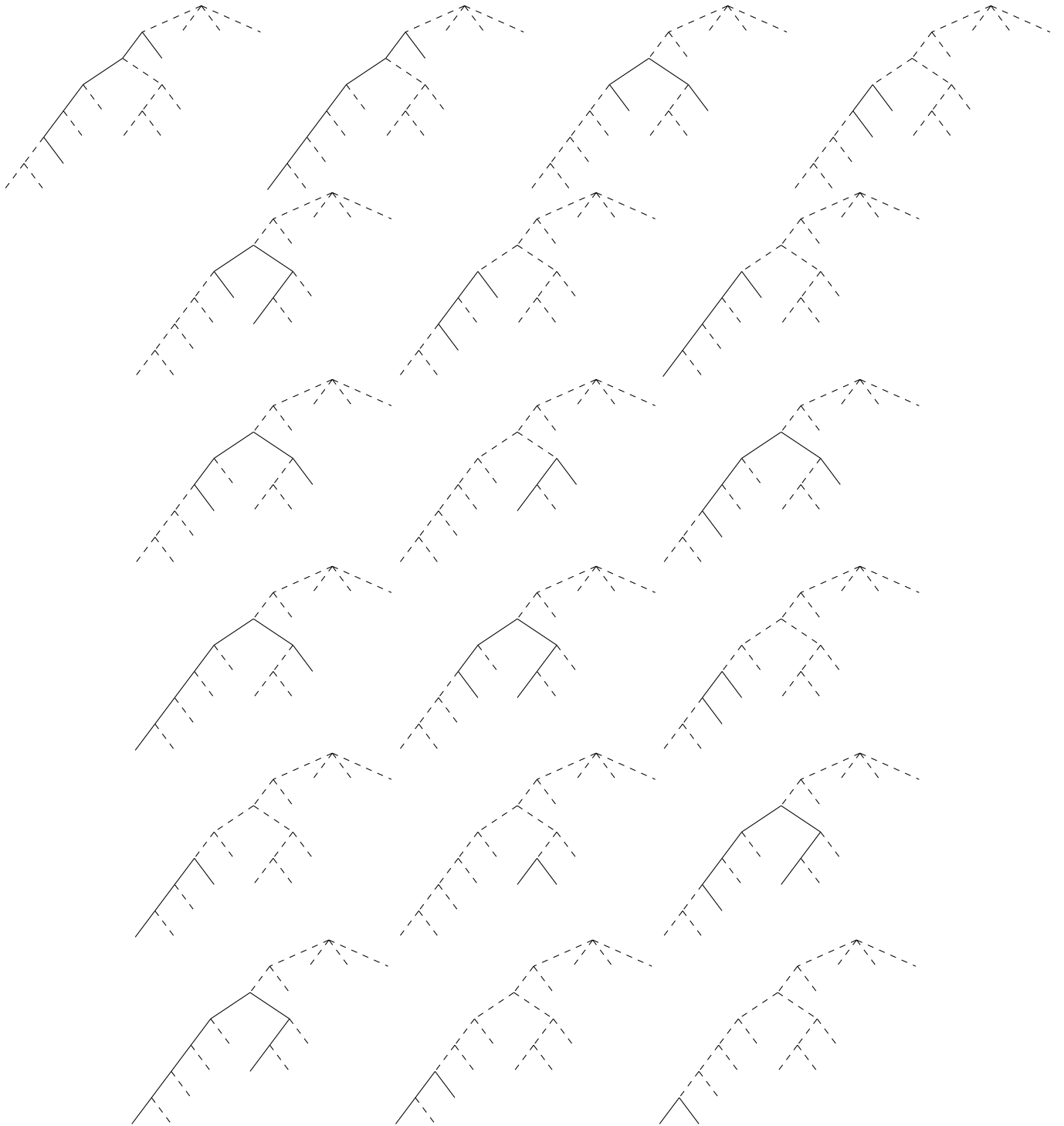
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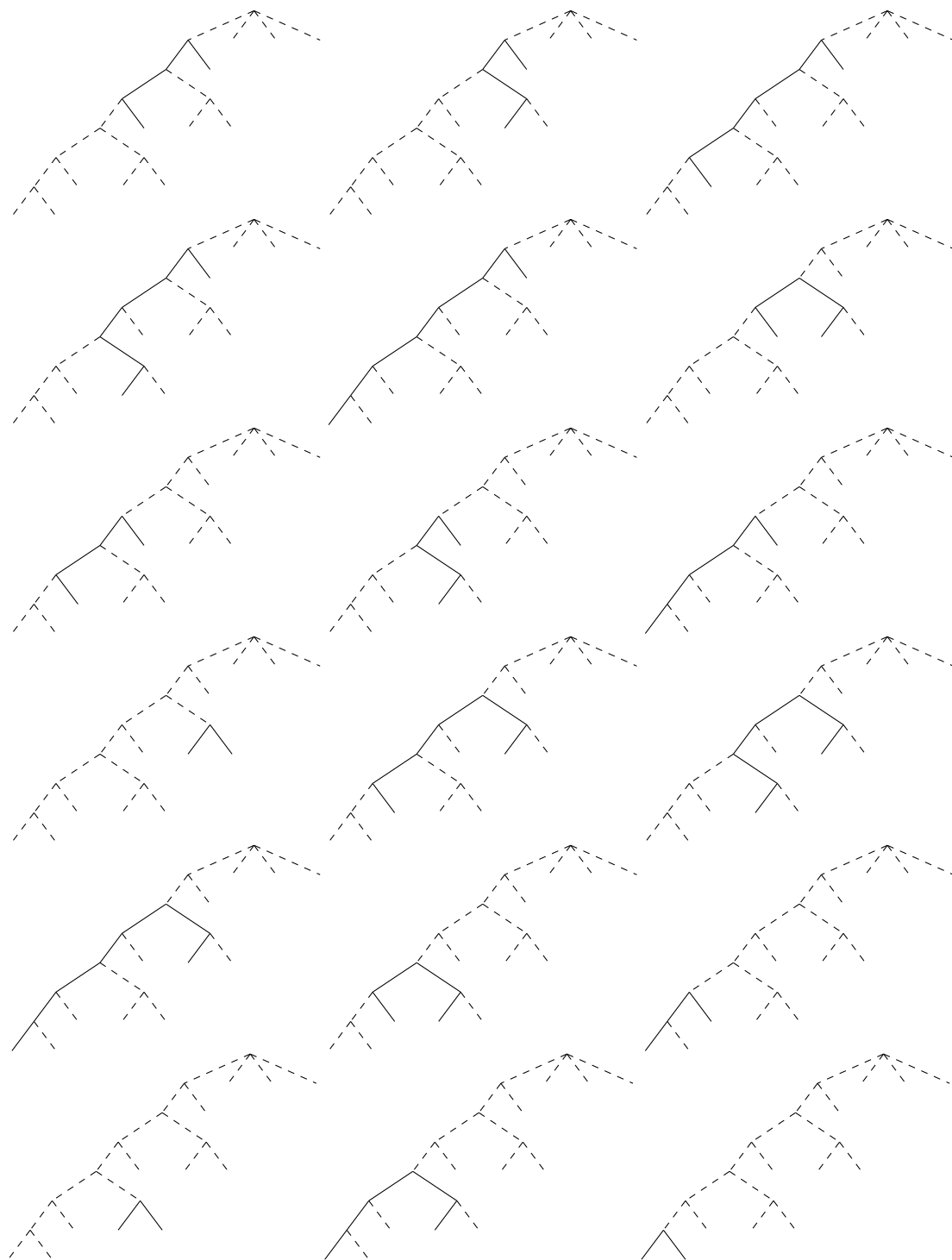


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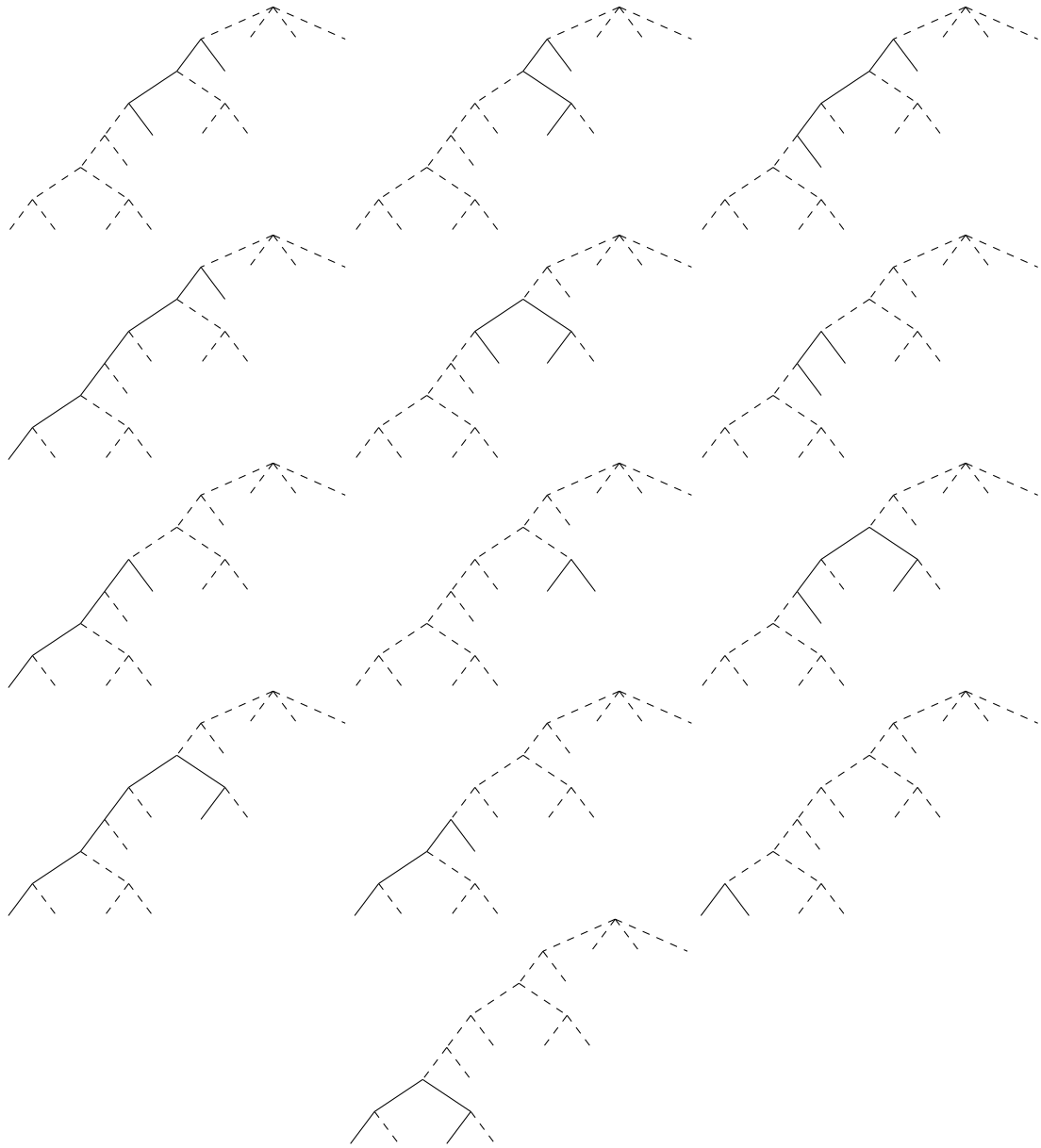
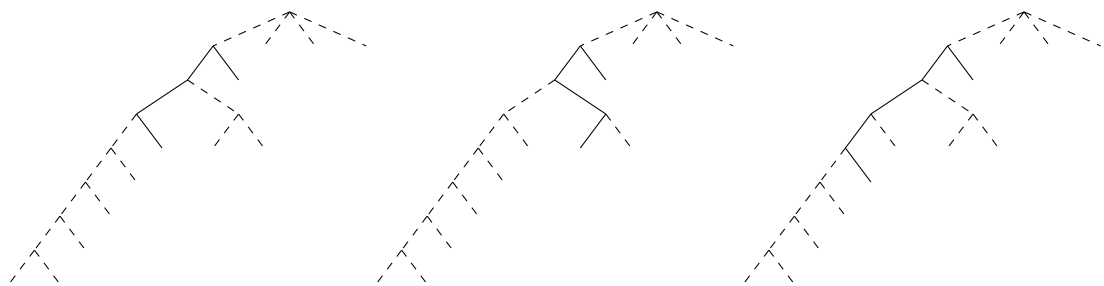


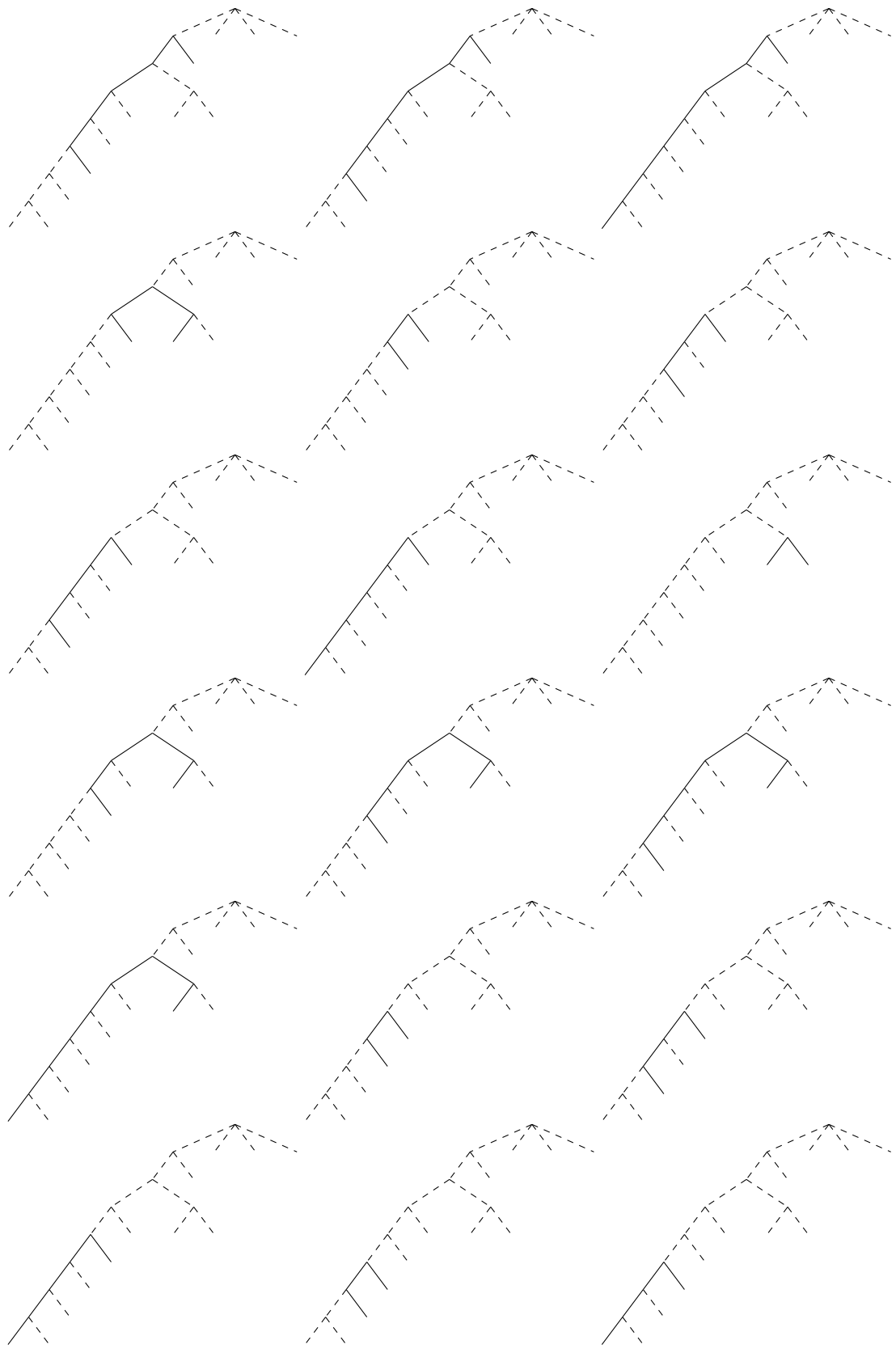
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**Topology 526**

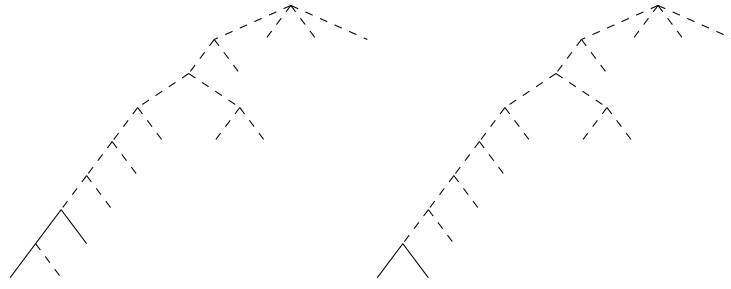
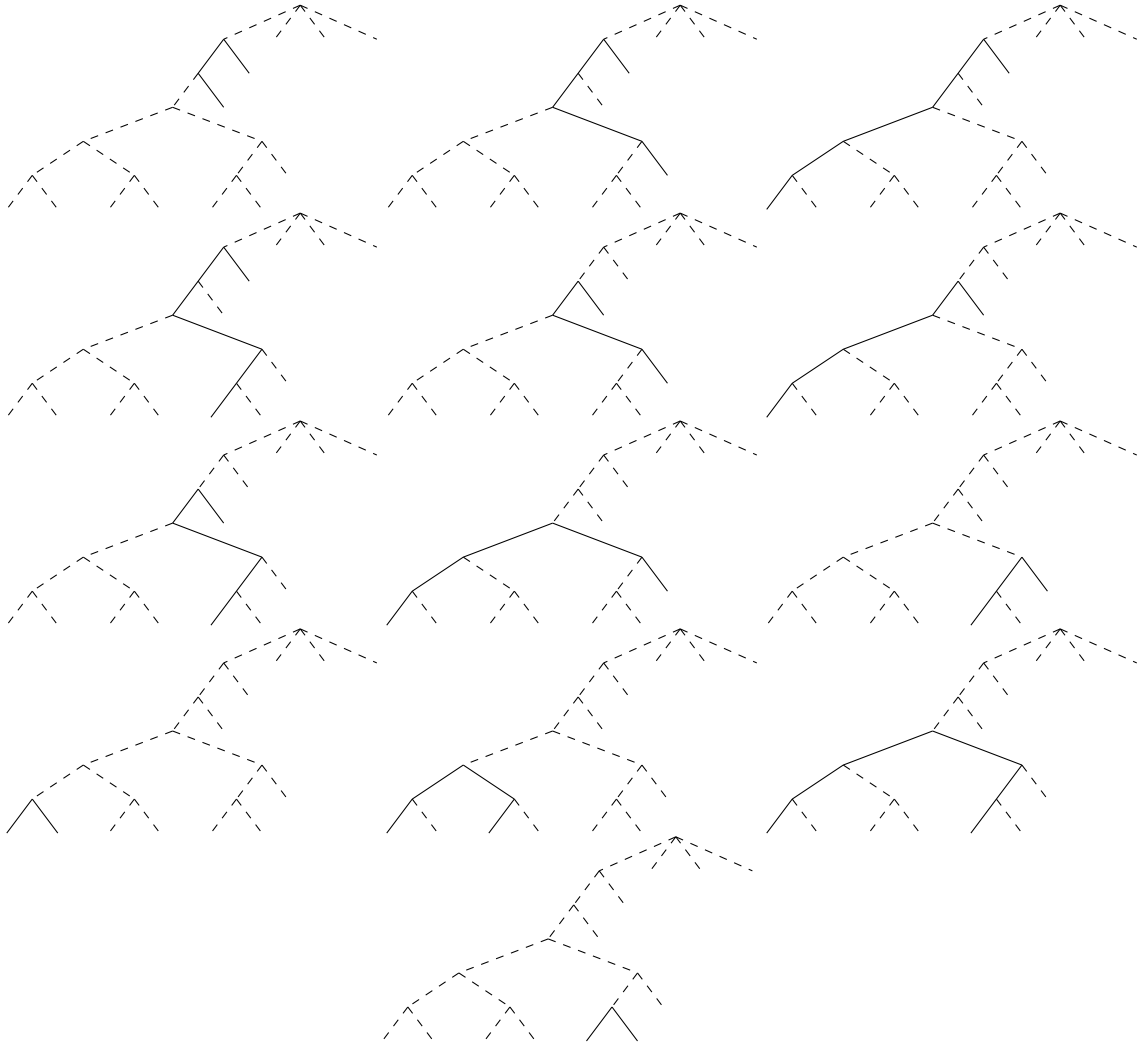


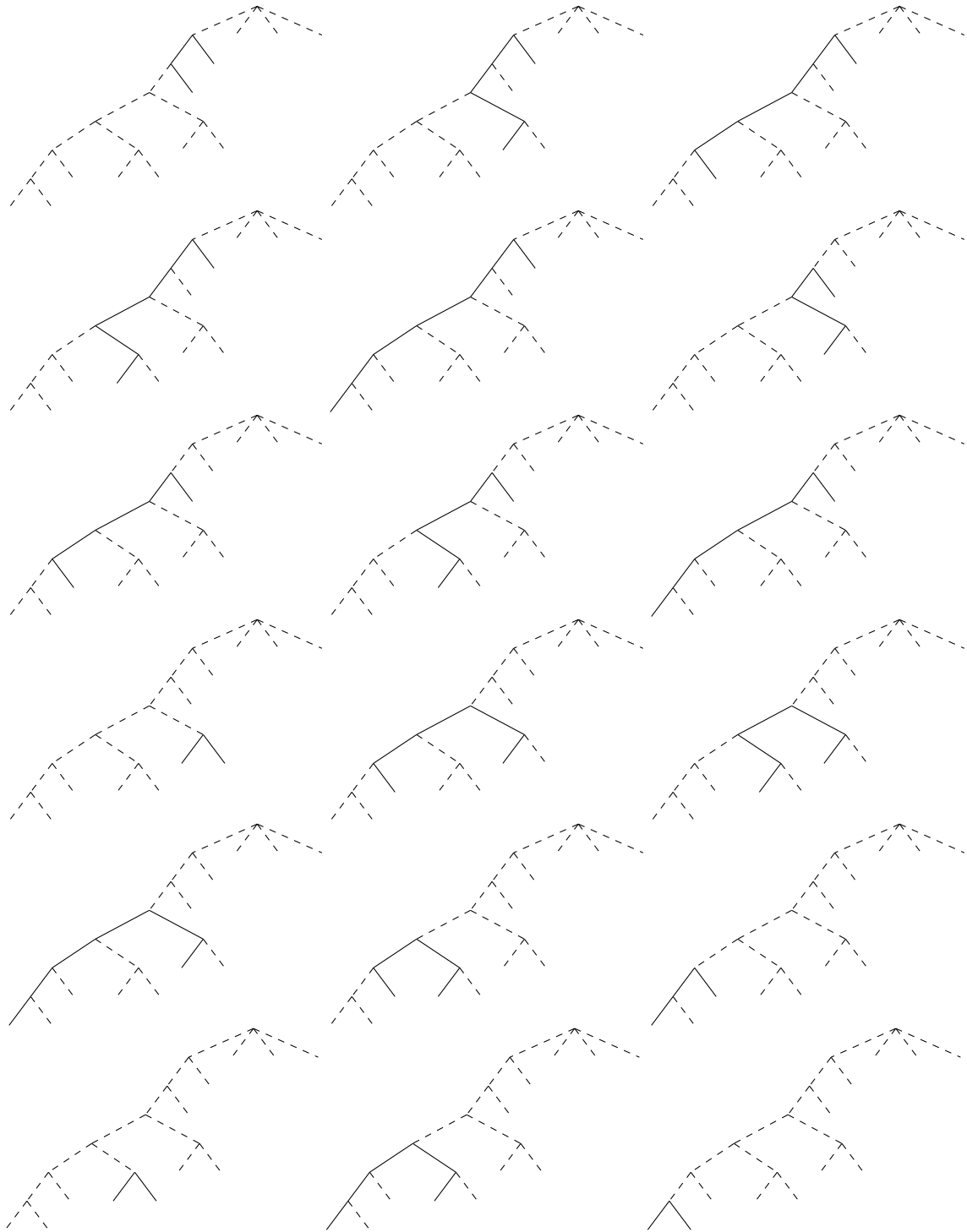
**Topology 527**

**Topology 528**

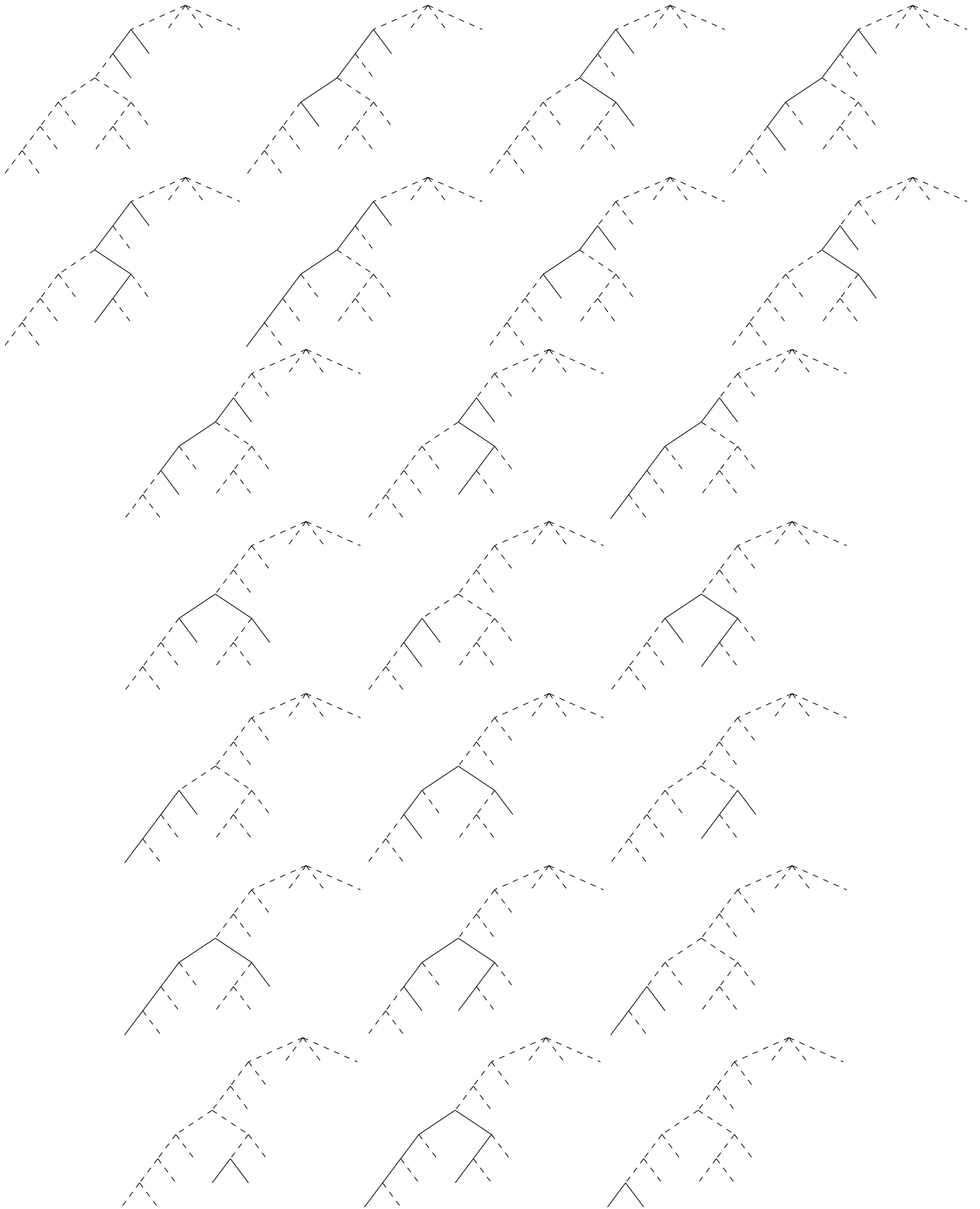


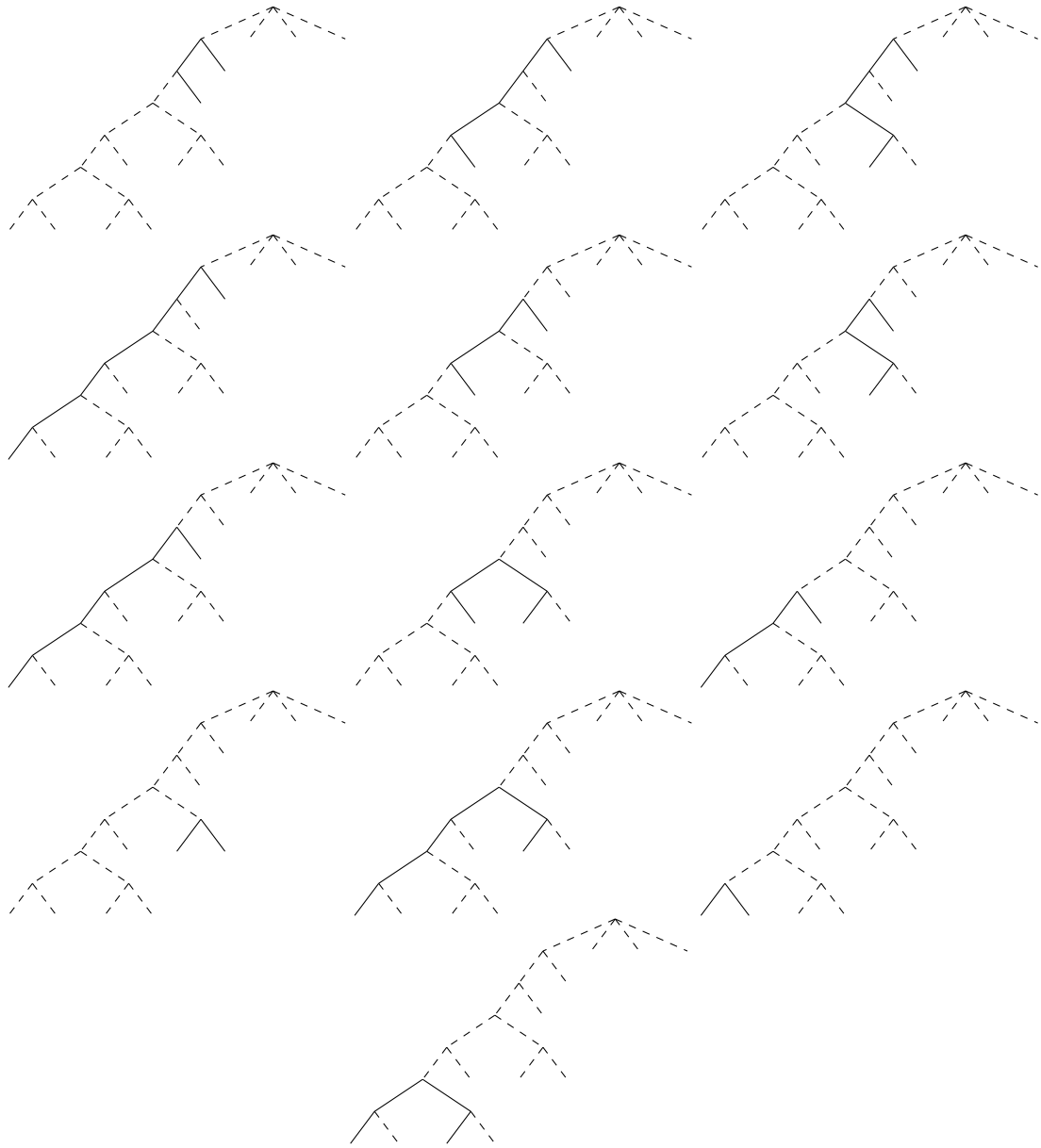
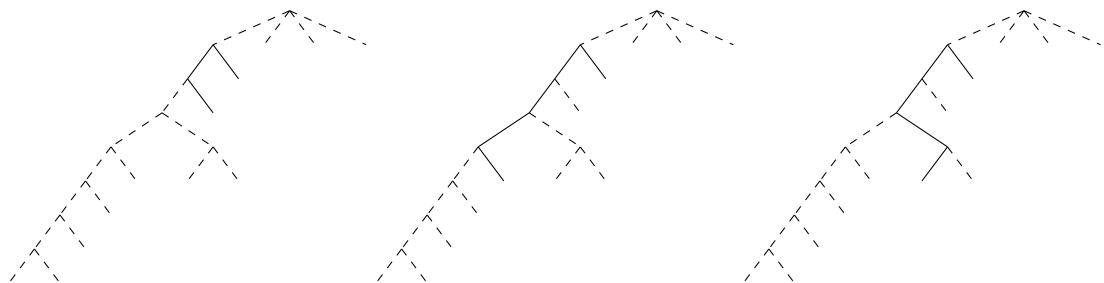


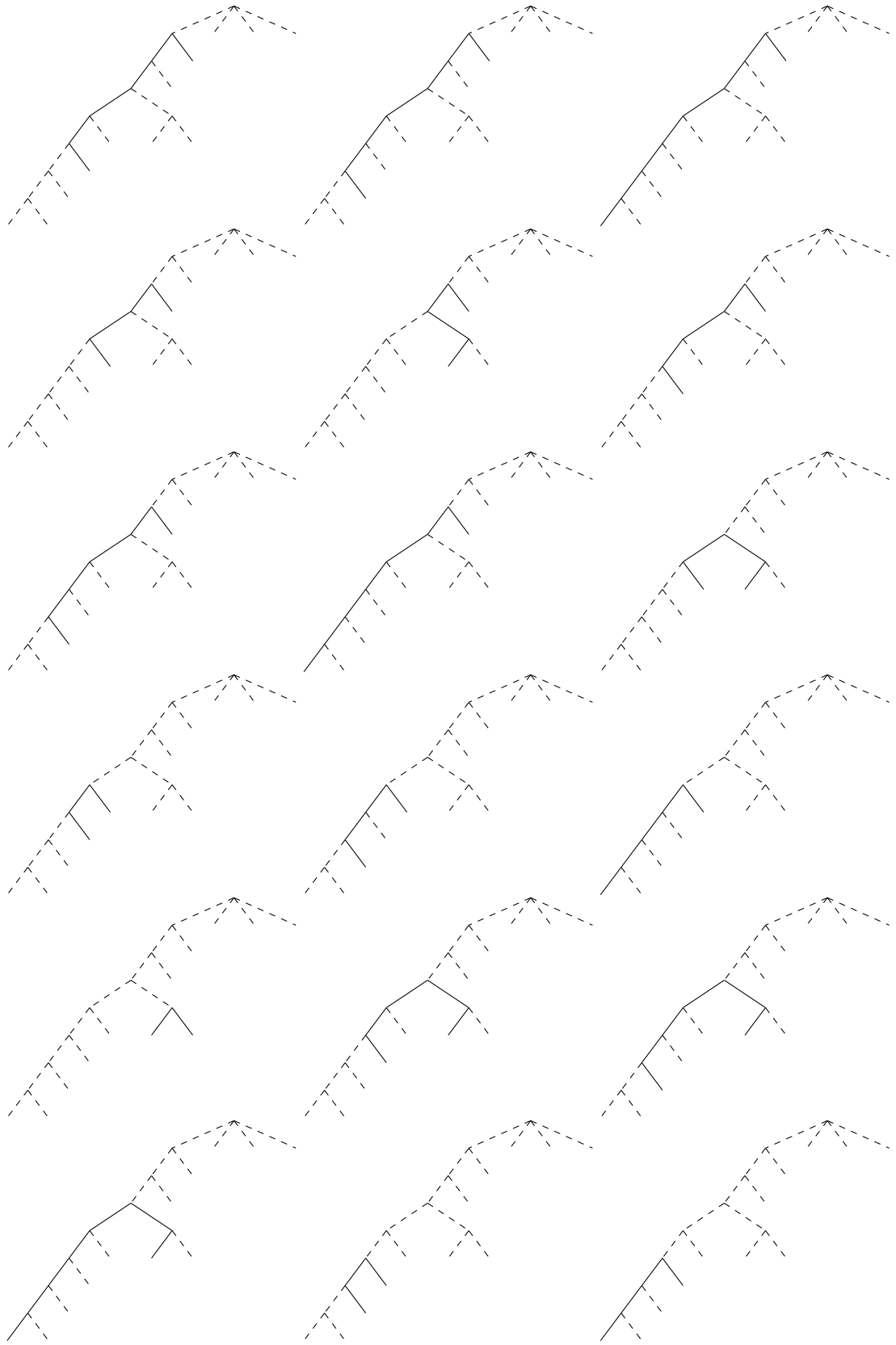
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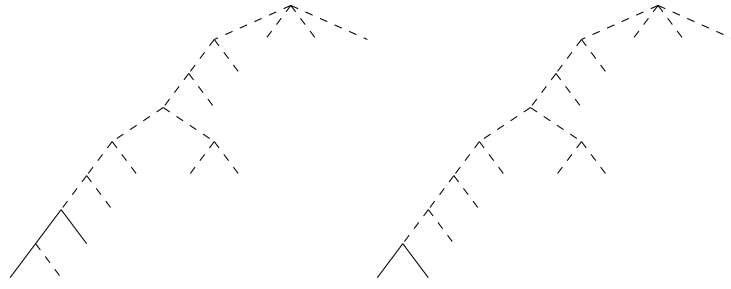
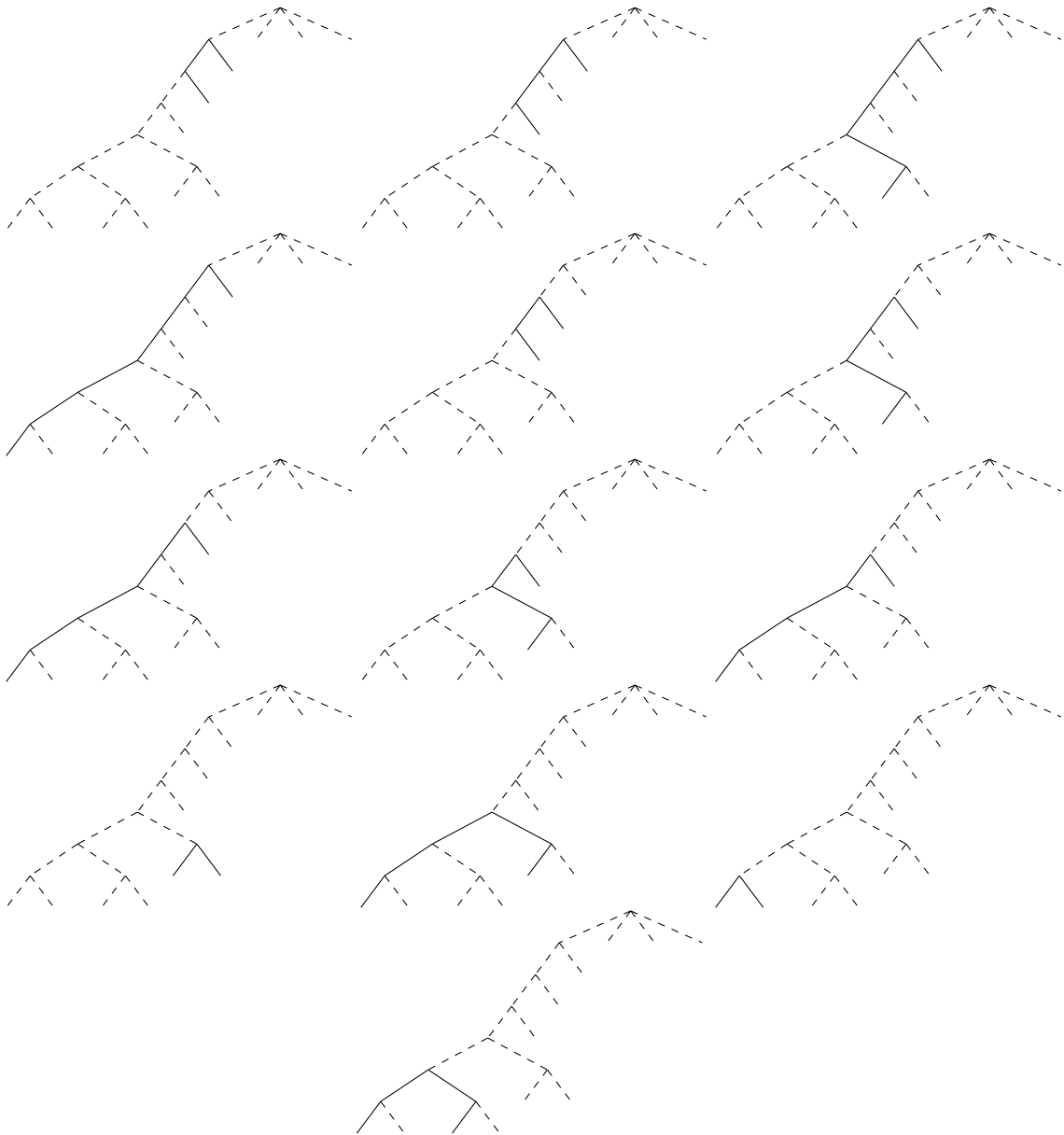


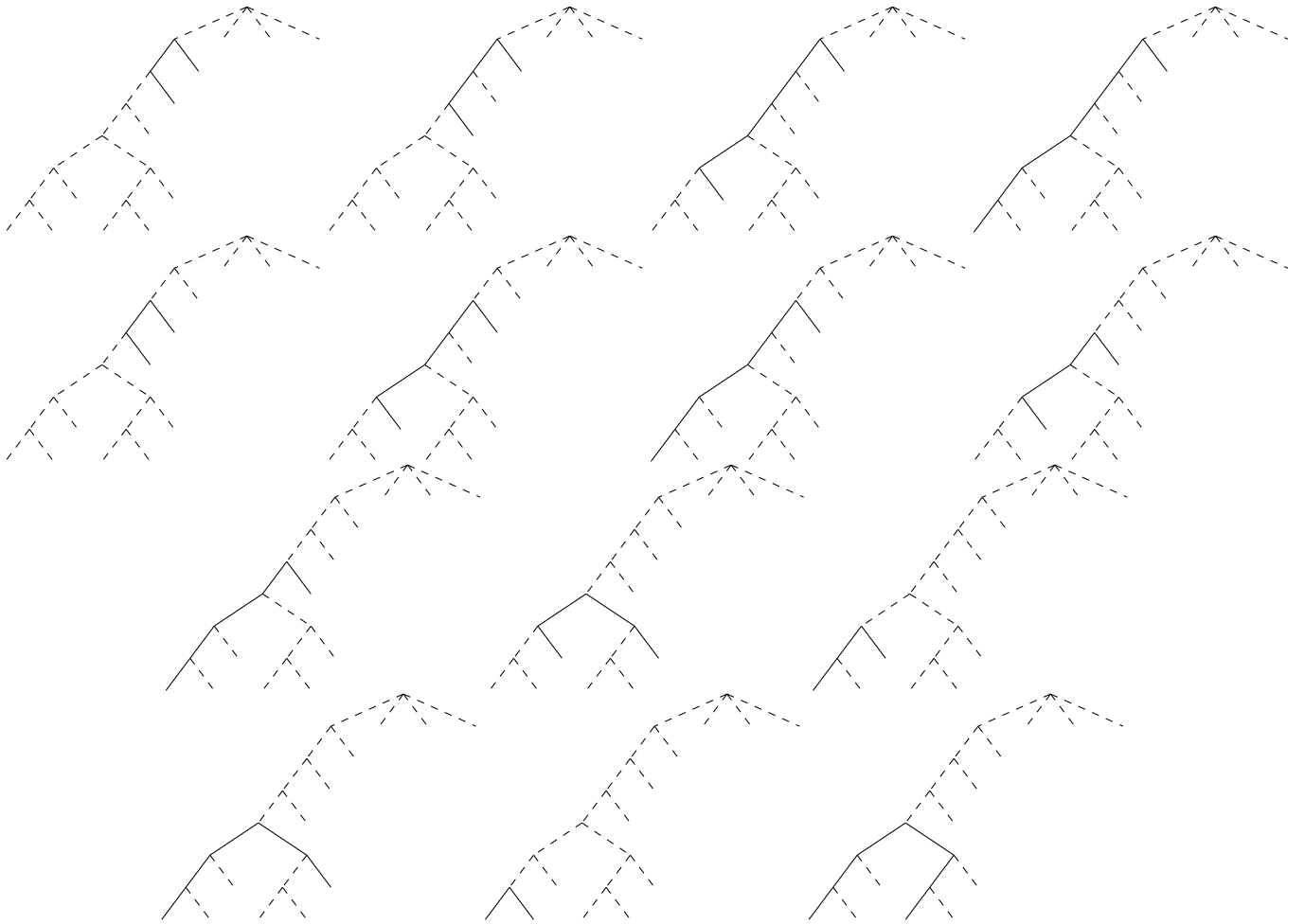
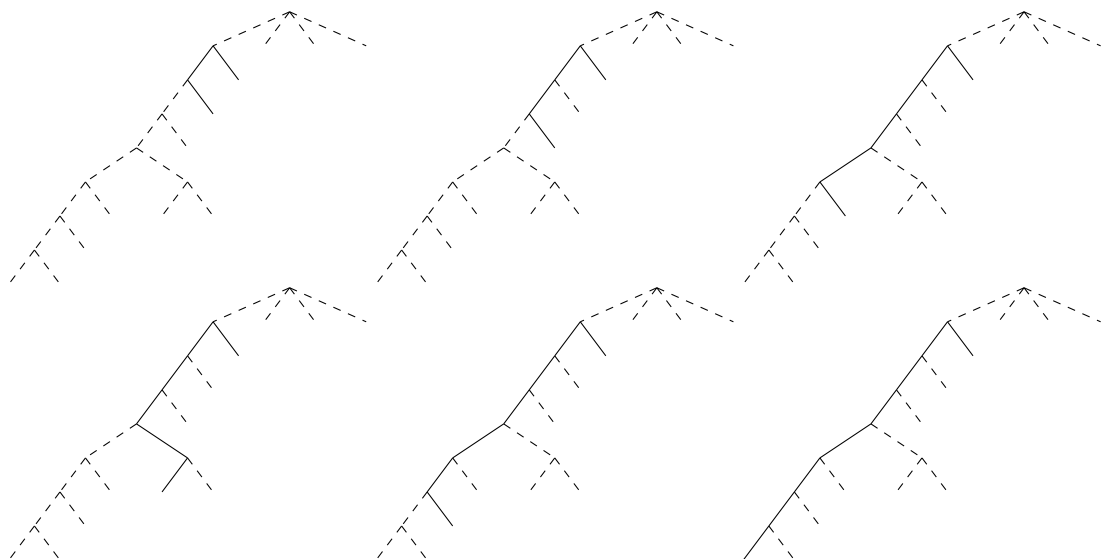
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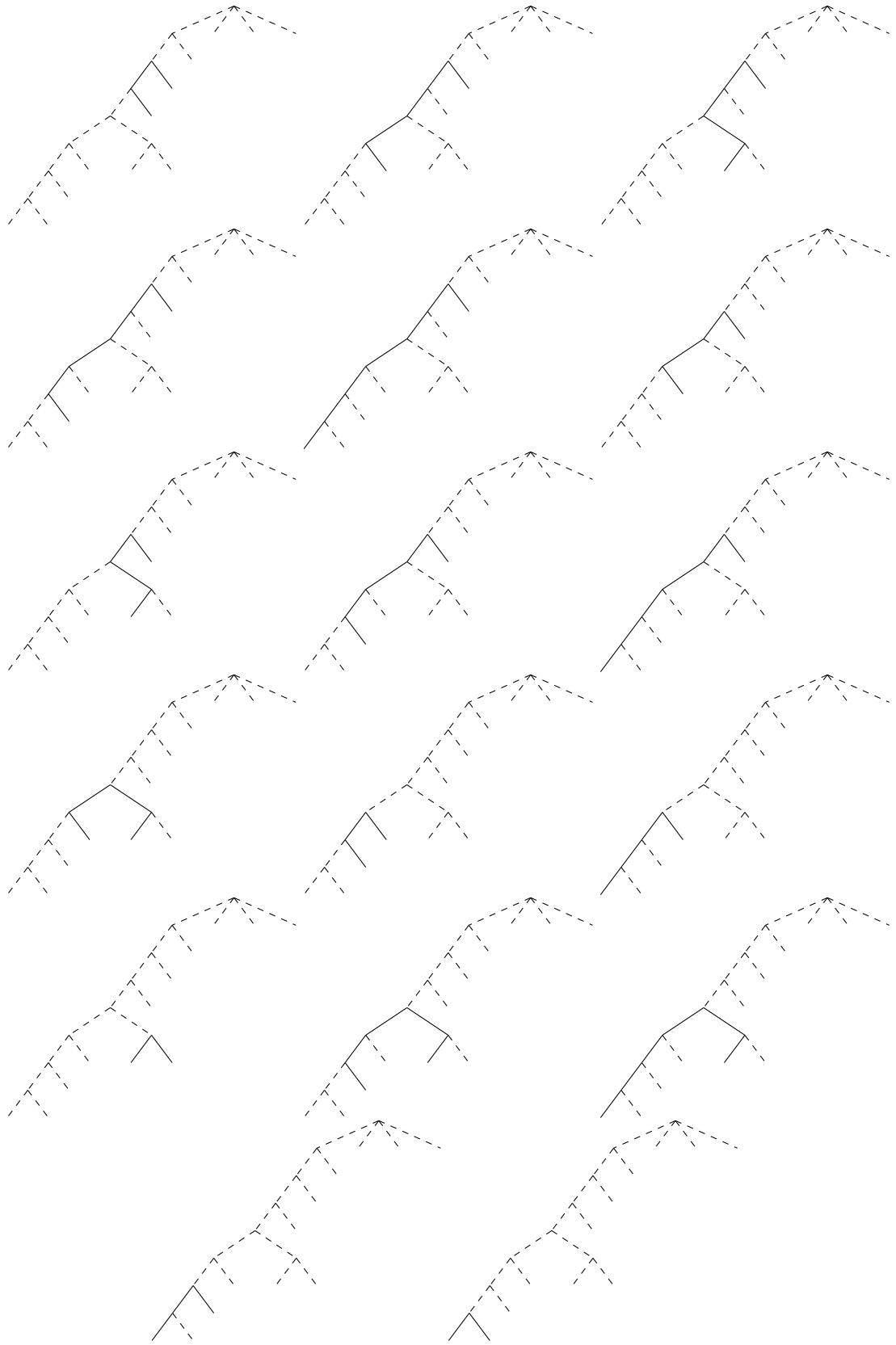


**Topology 532****Topology 533**



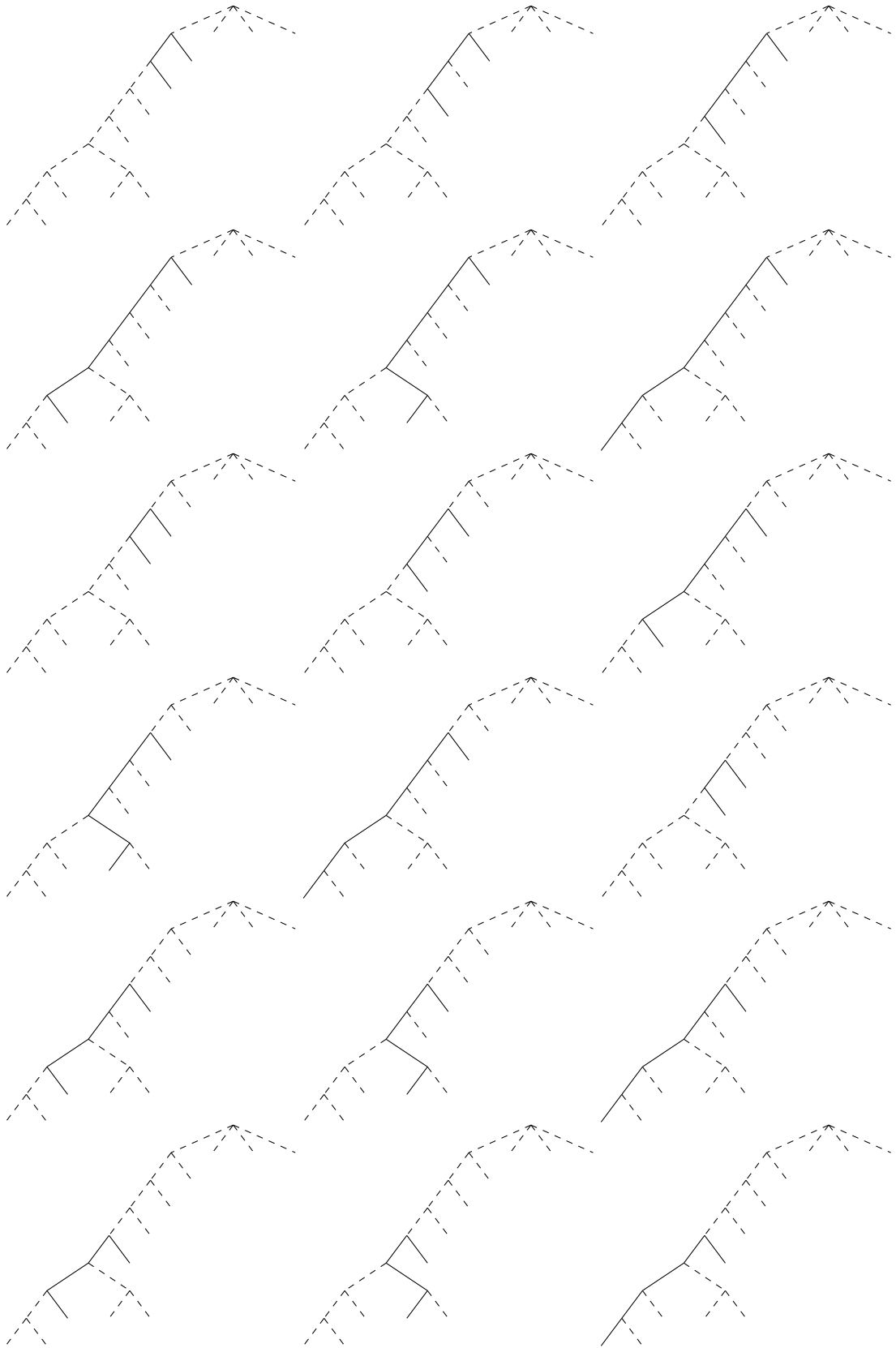
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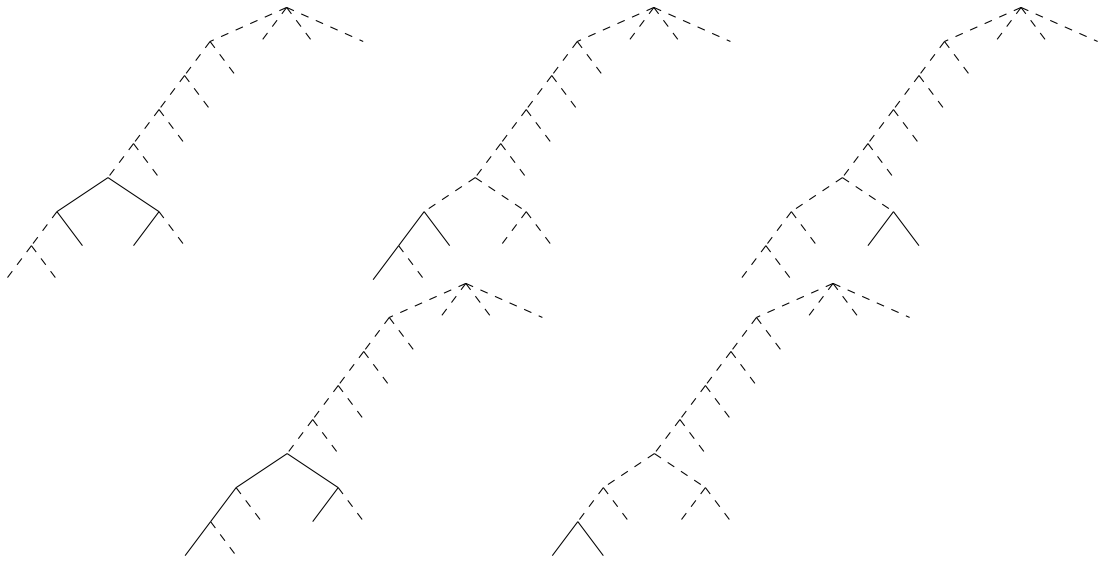
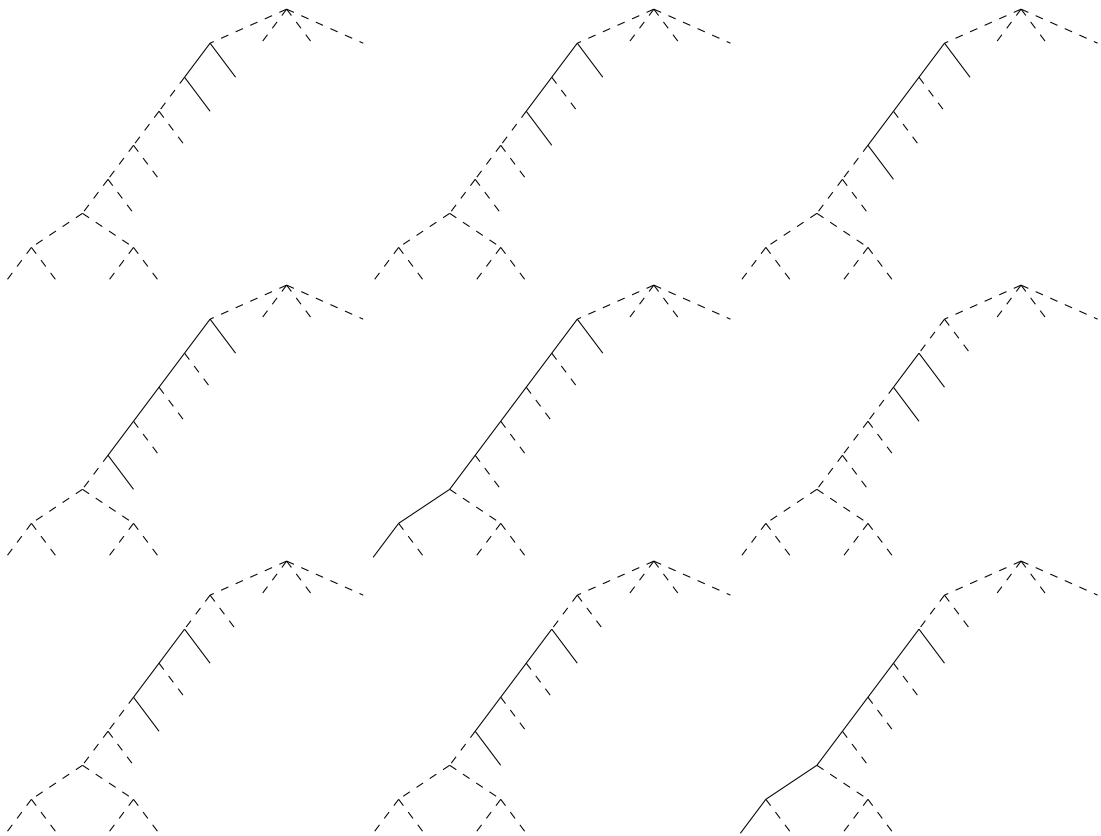
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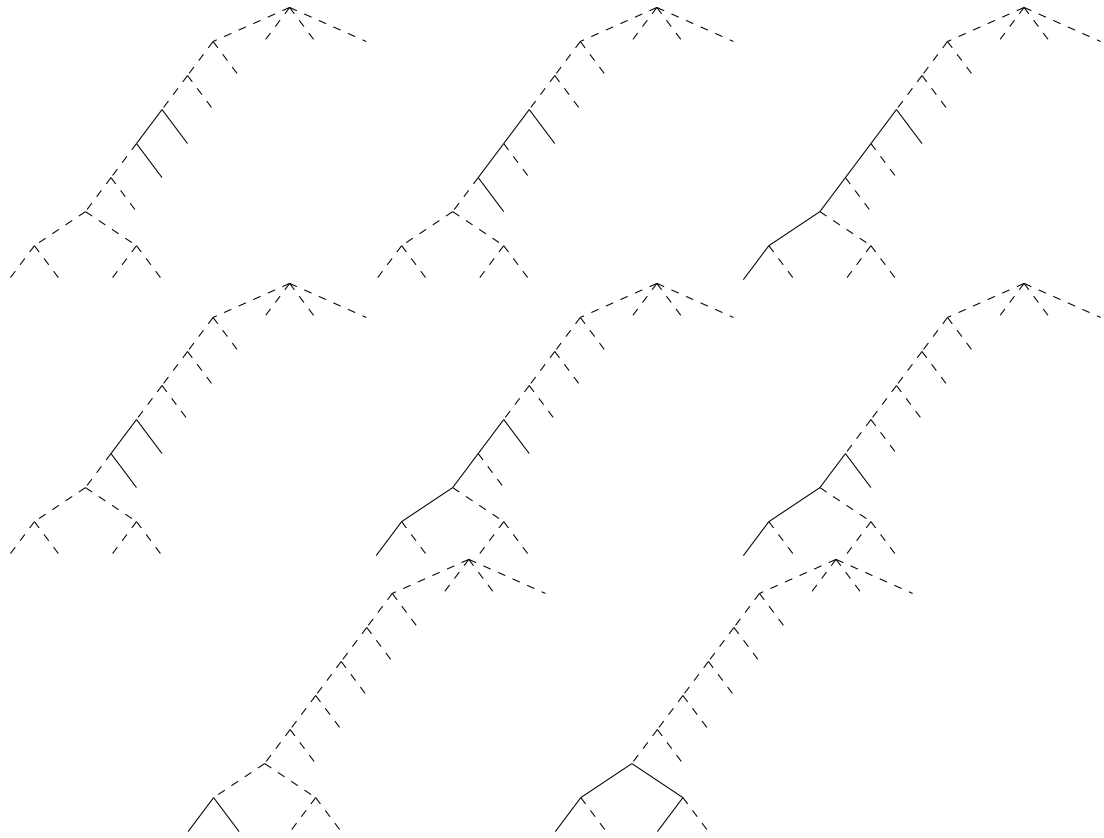
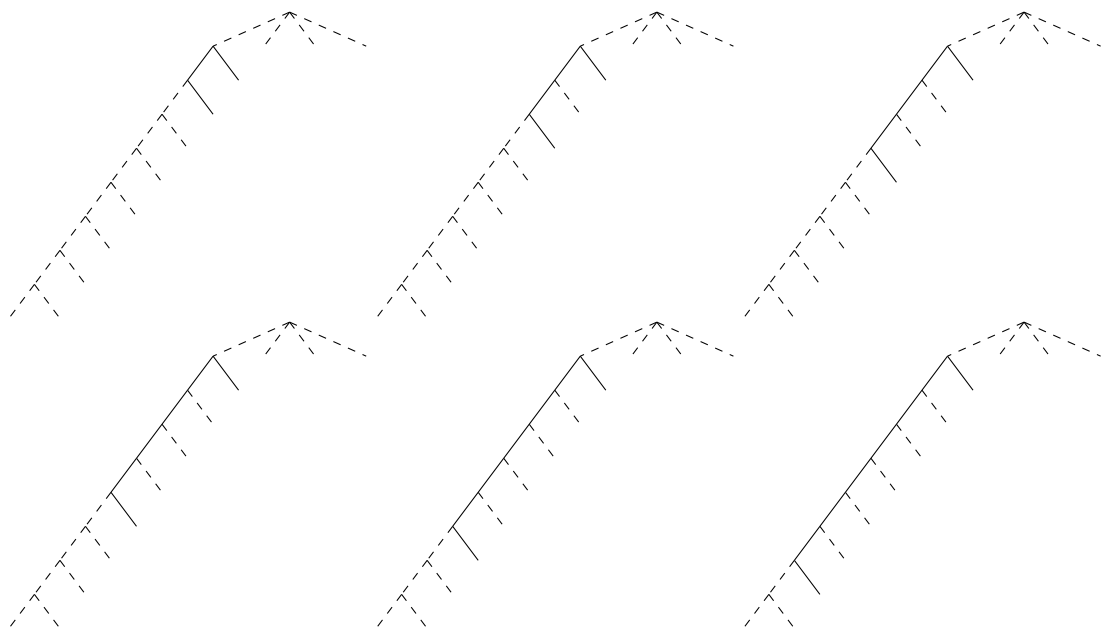


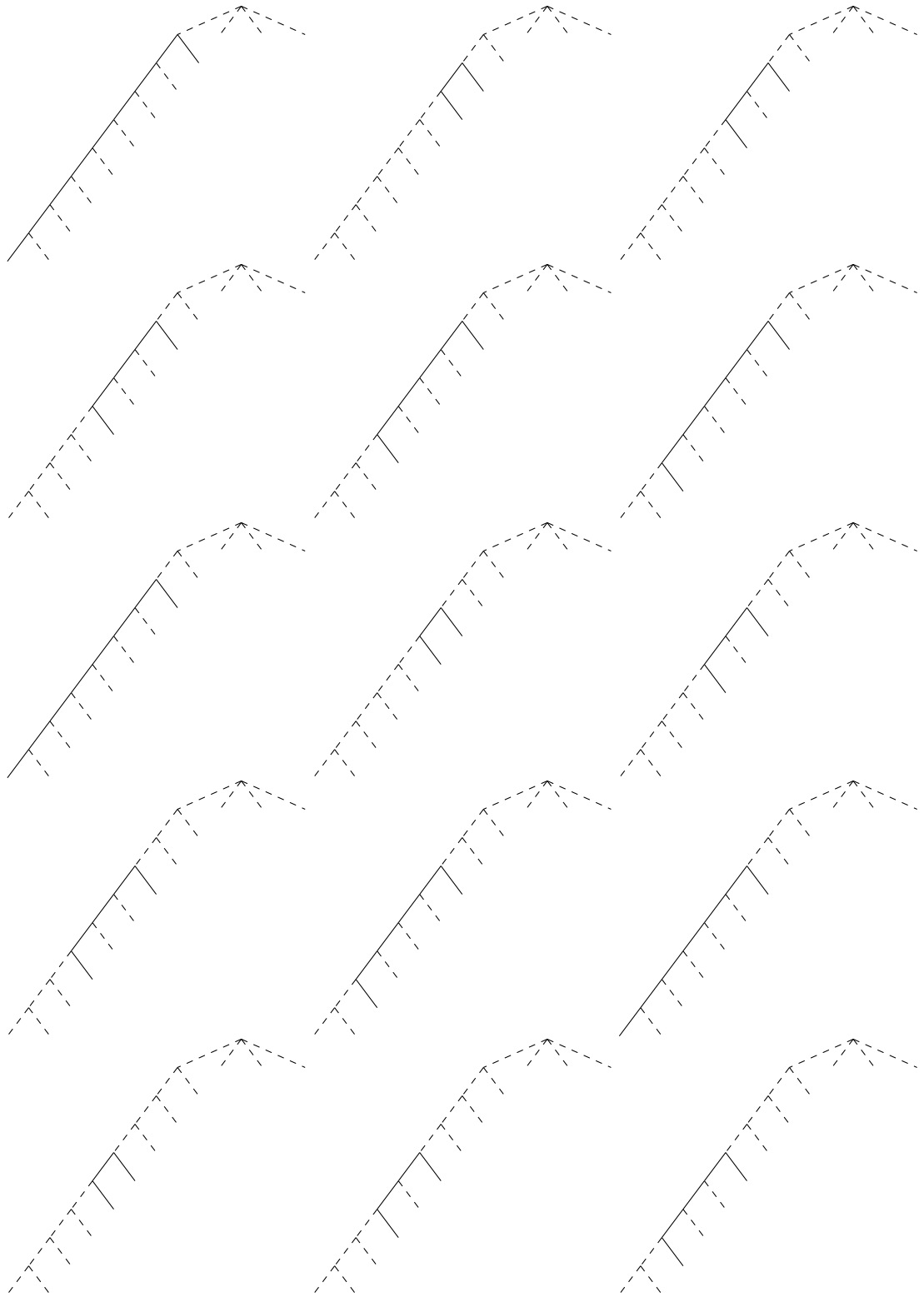


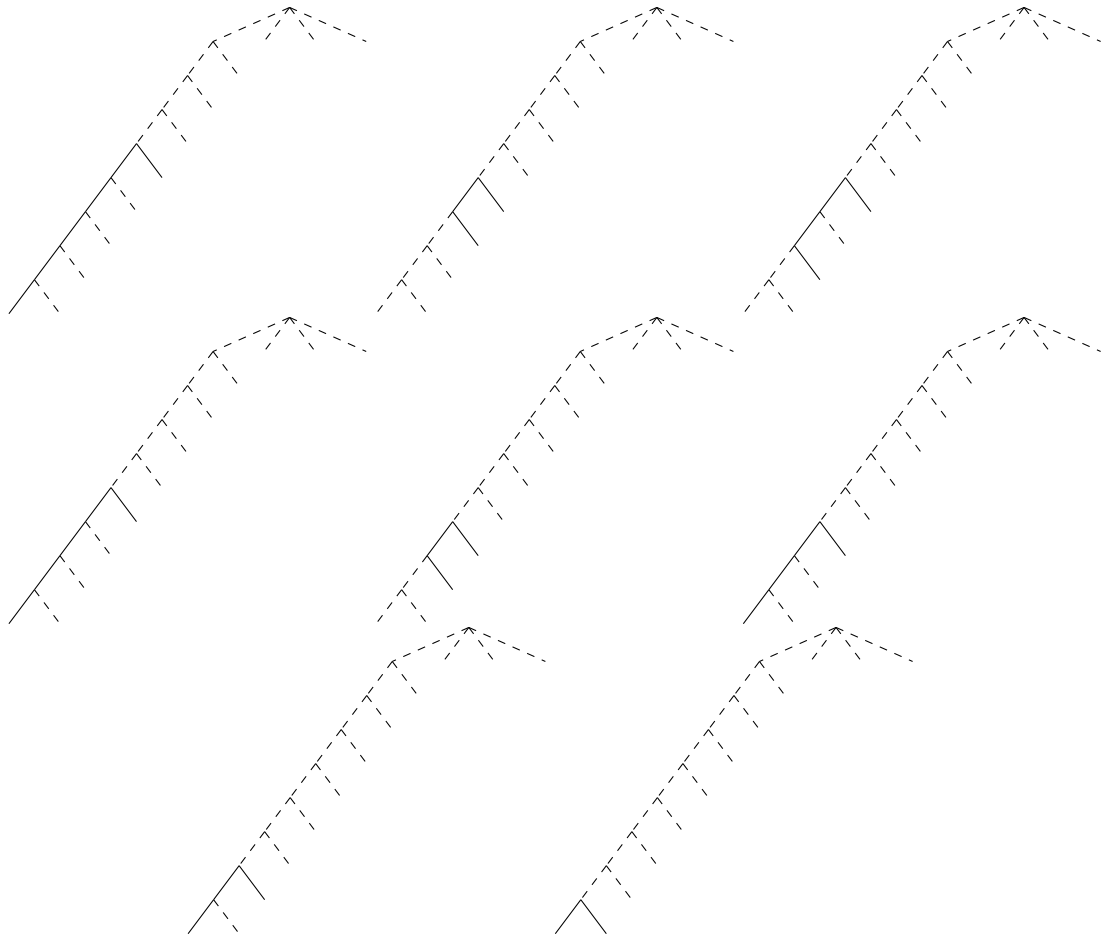
## Topology 537



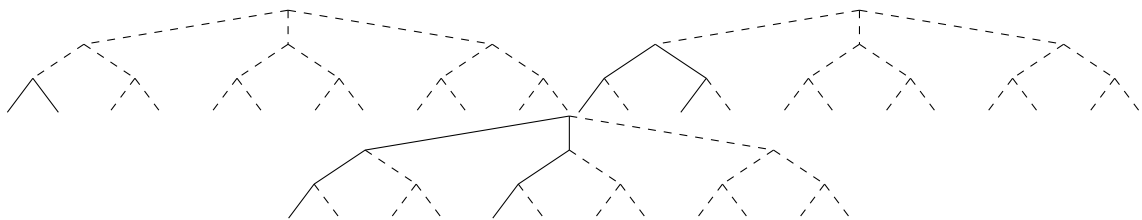
**Topology 538**

**Topology 539**

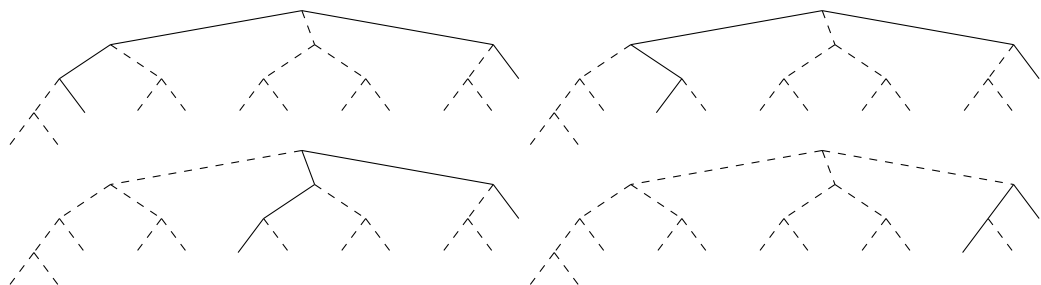


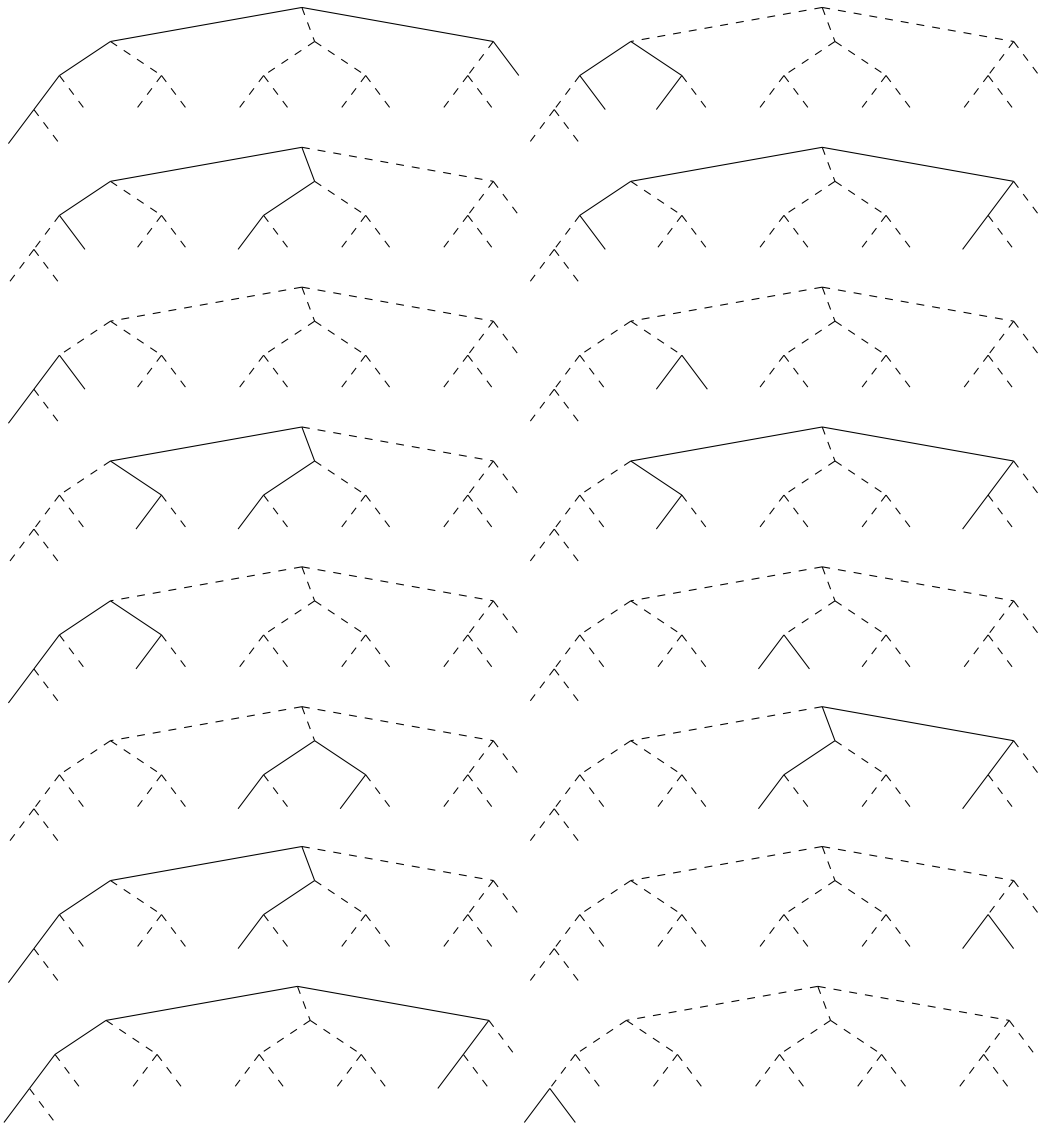
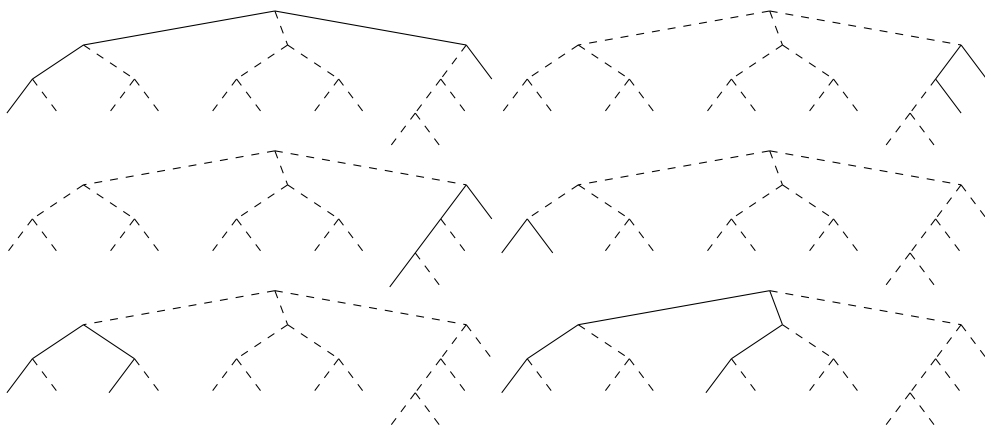


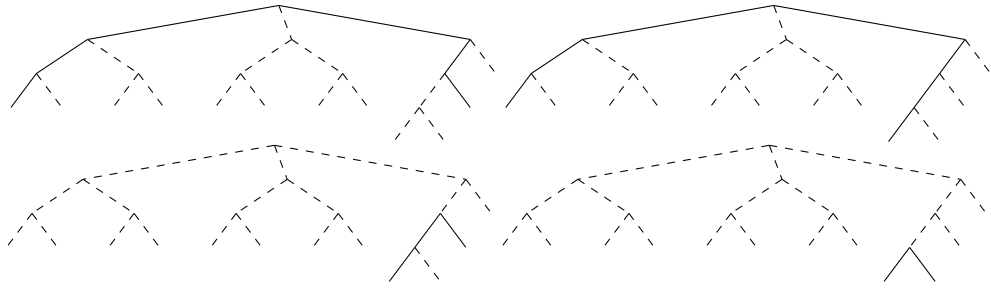
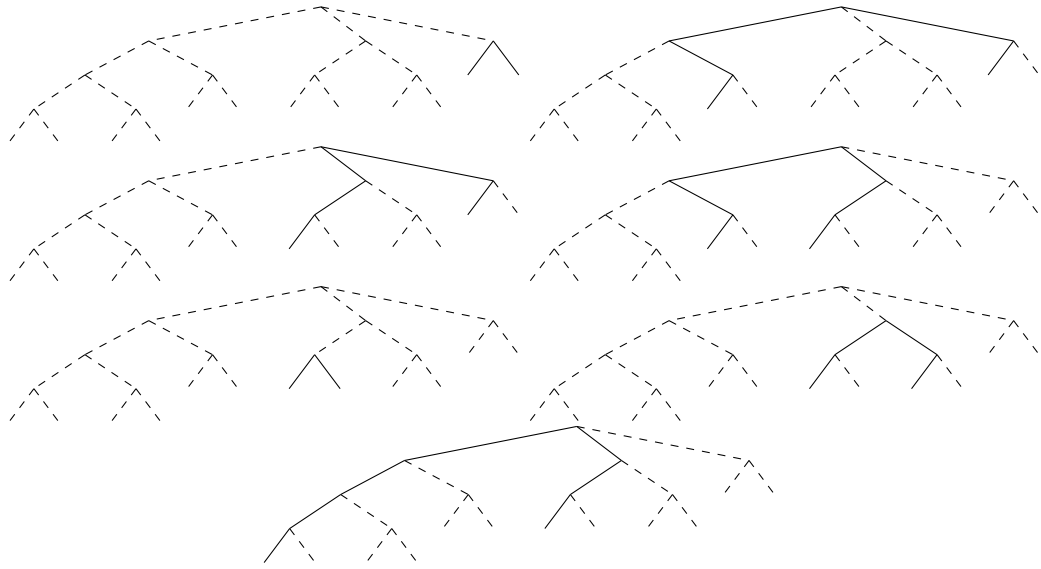
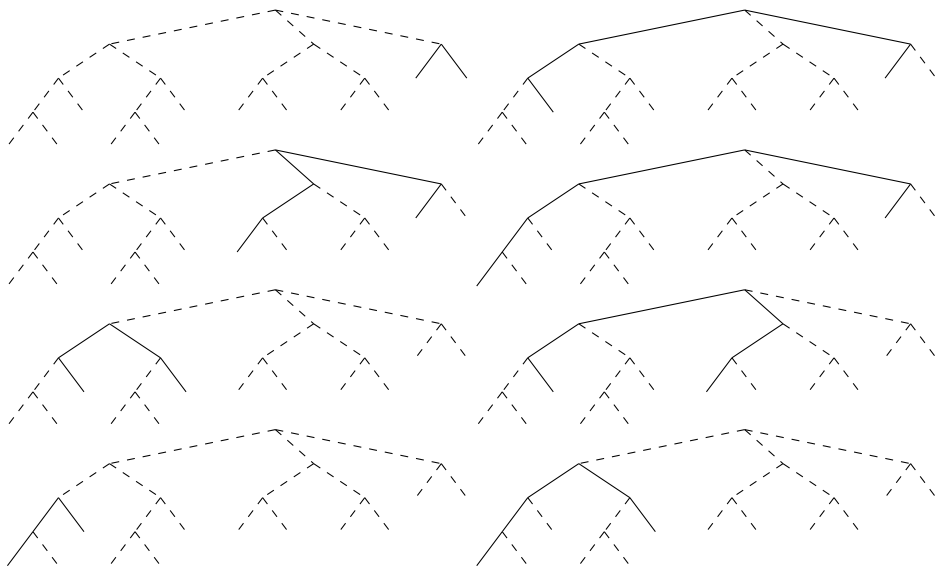
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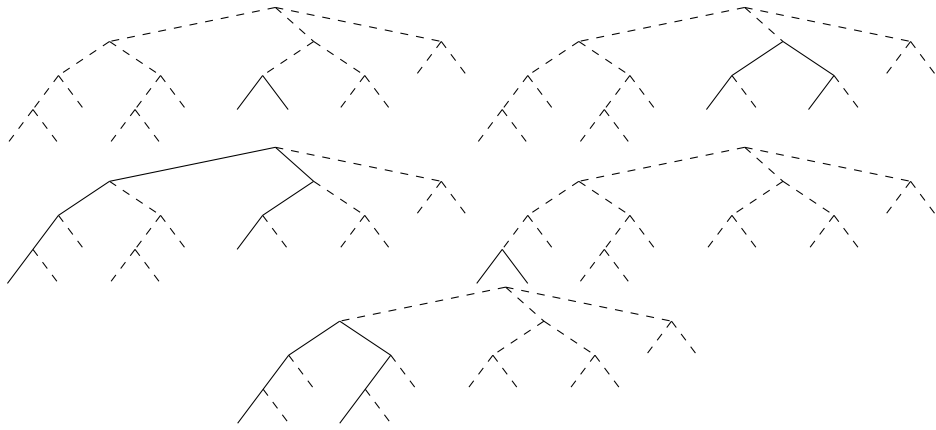
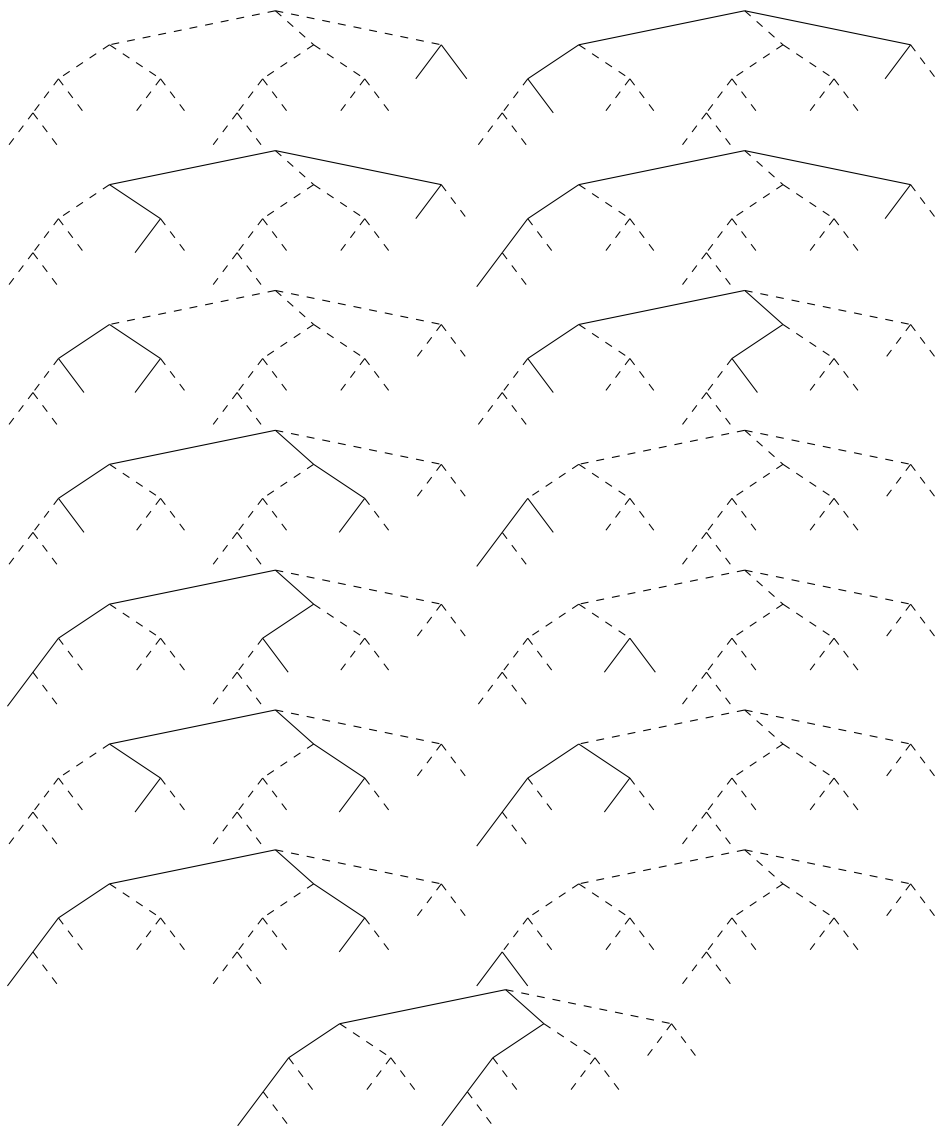


**Topology 541**



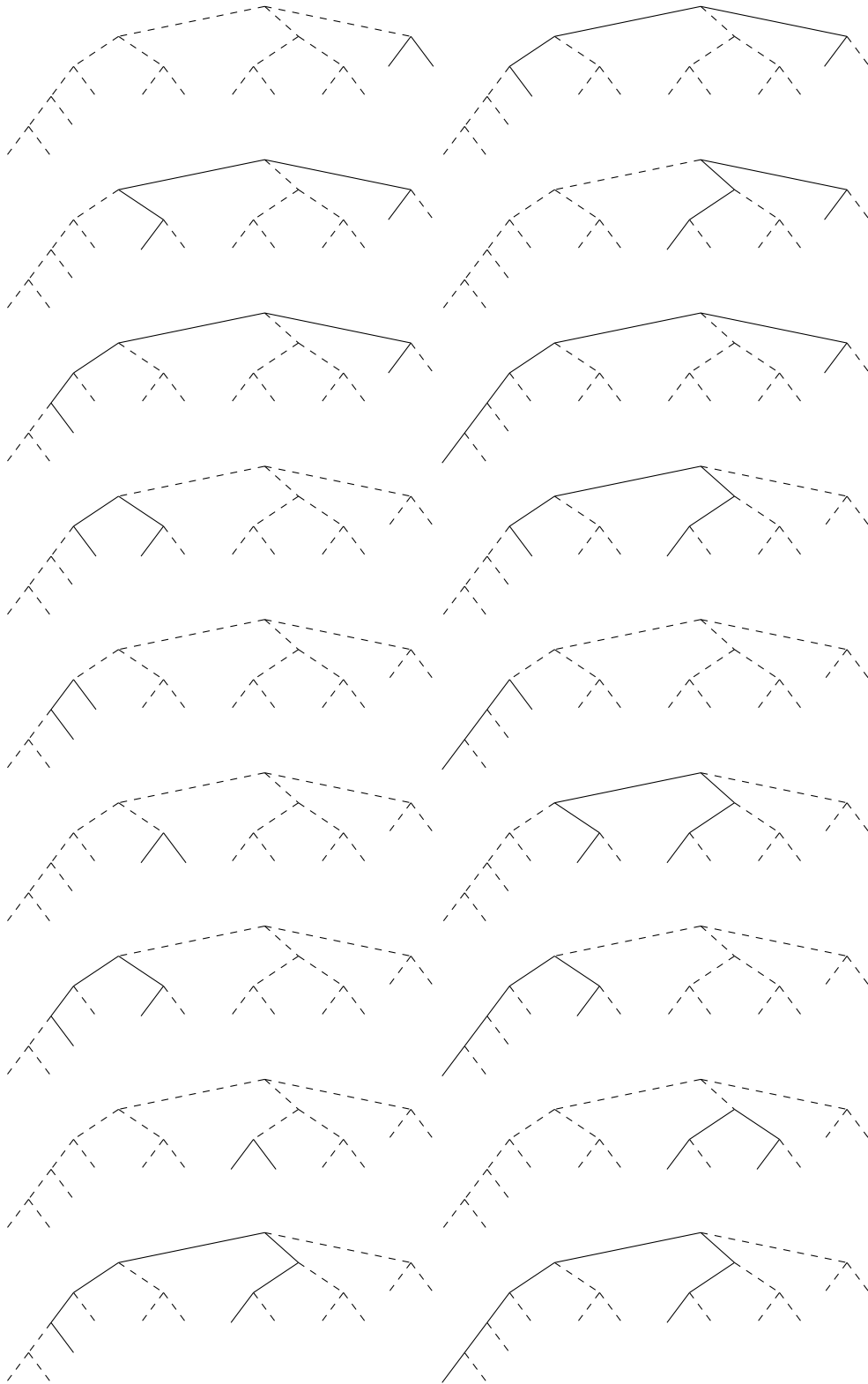
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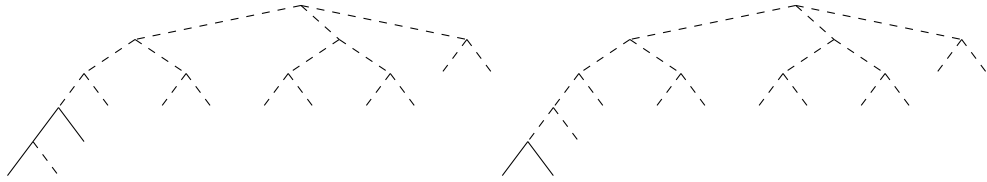
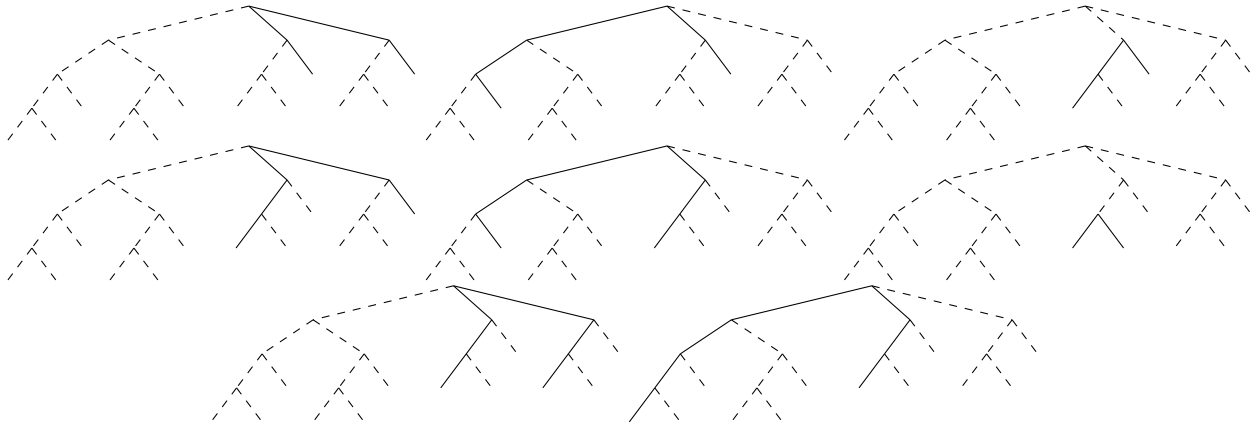
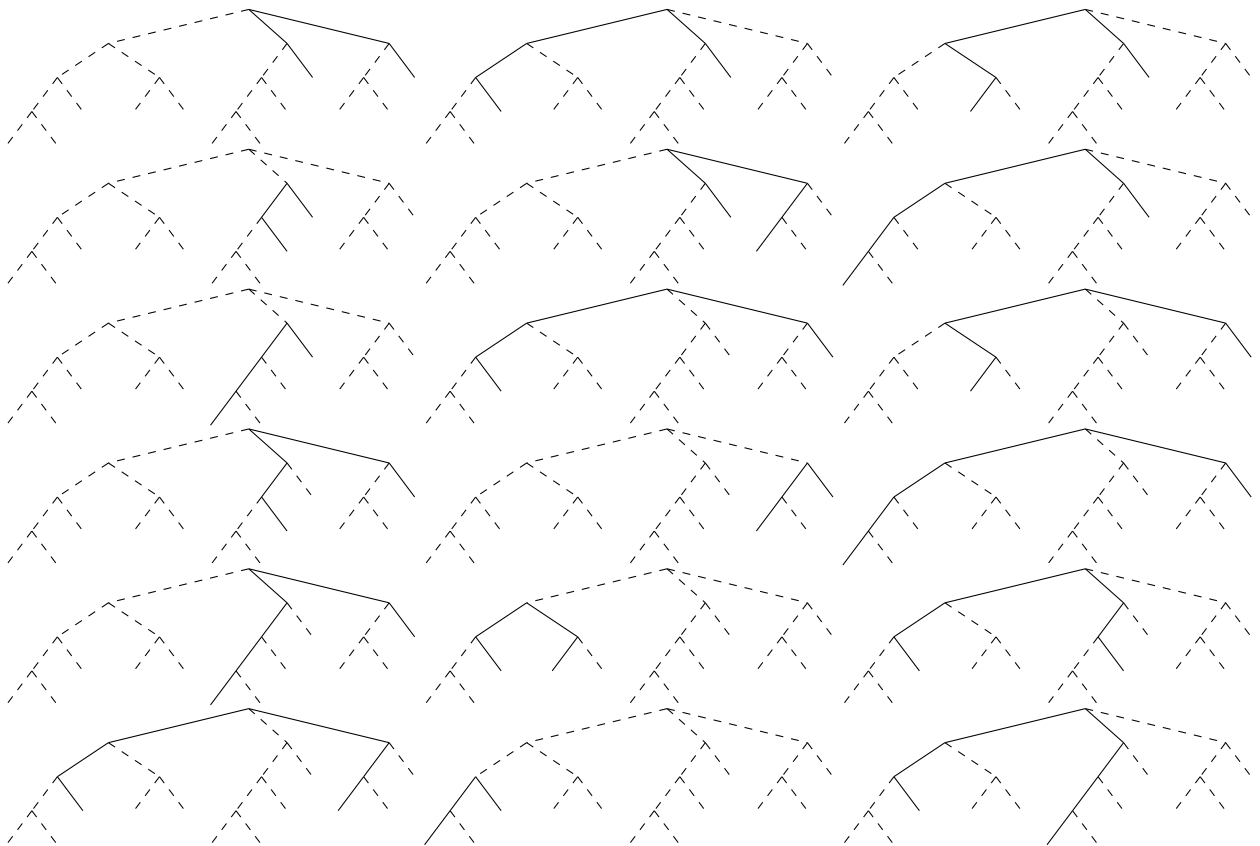
**Topology 543****Topology 544**

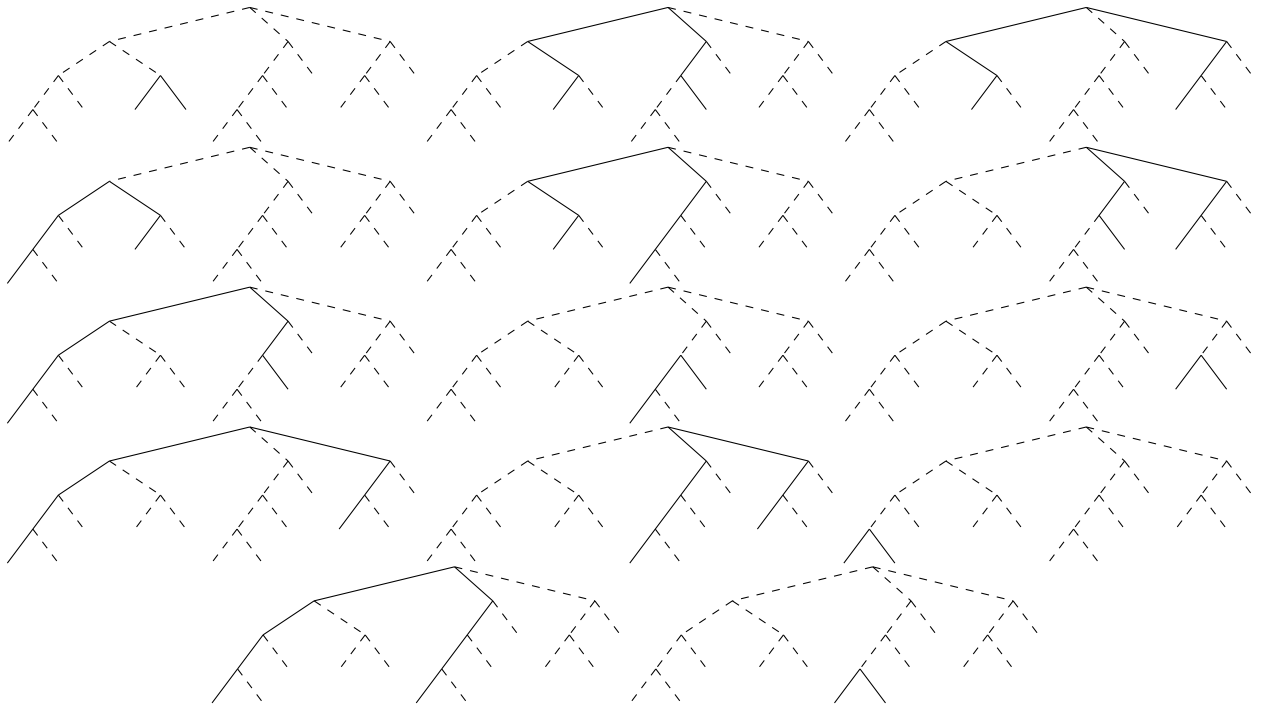
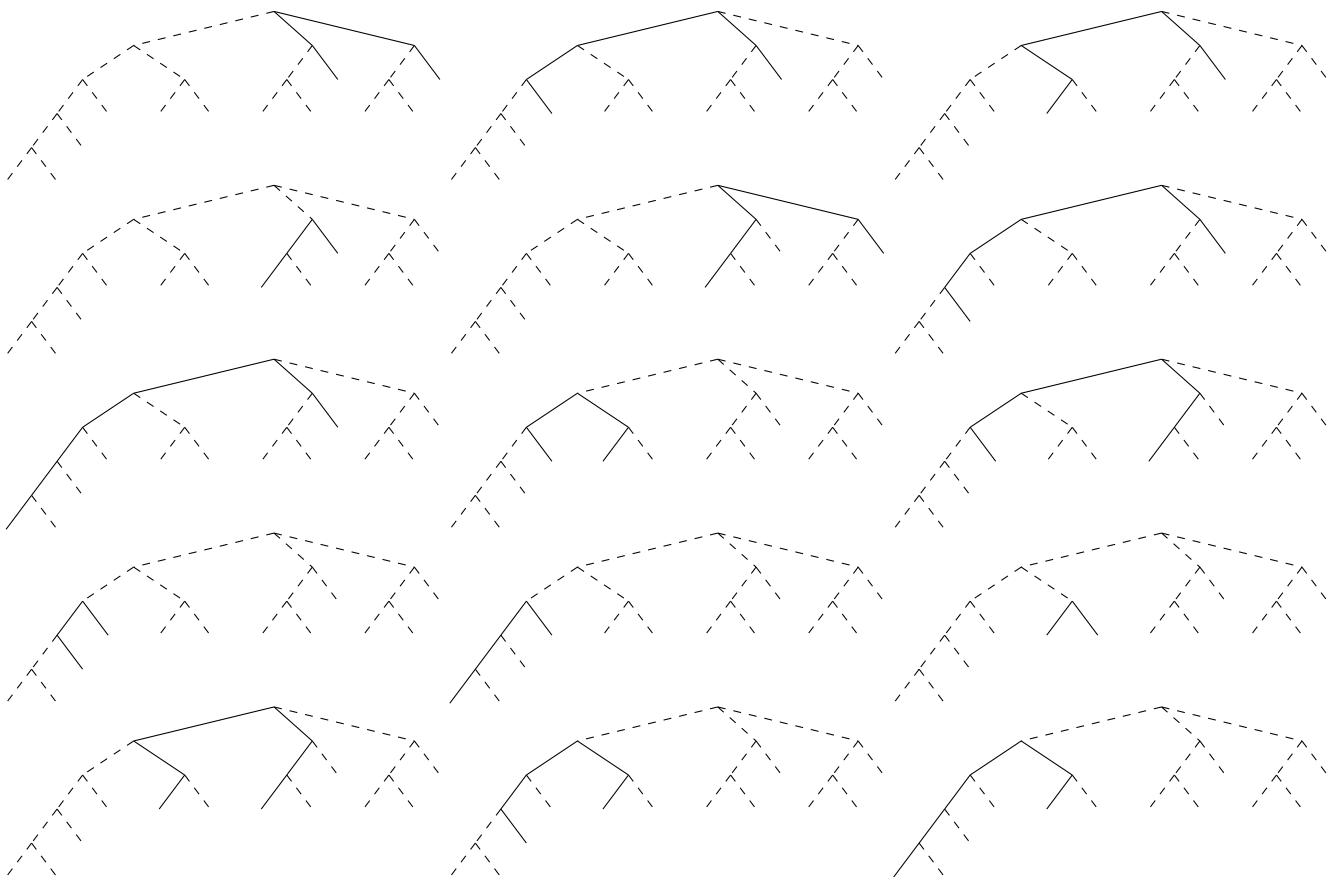
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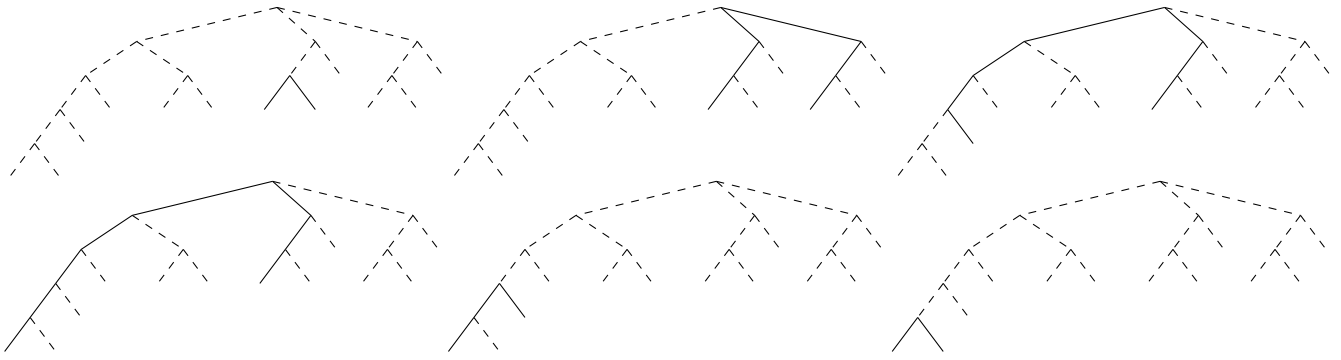
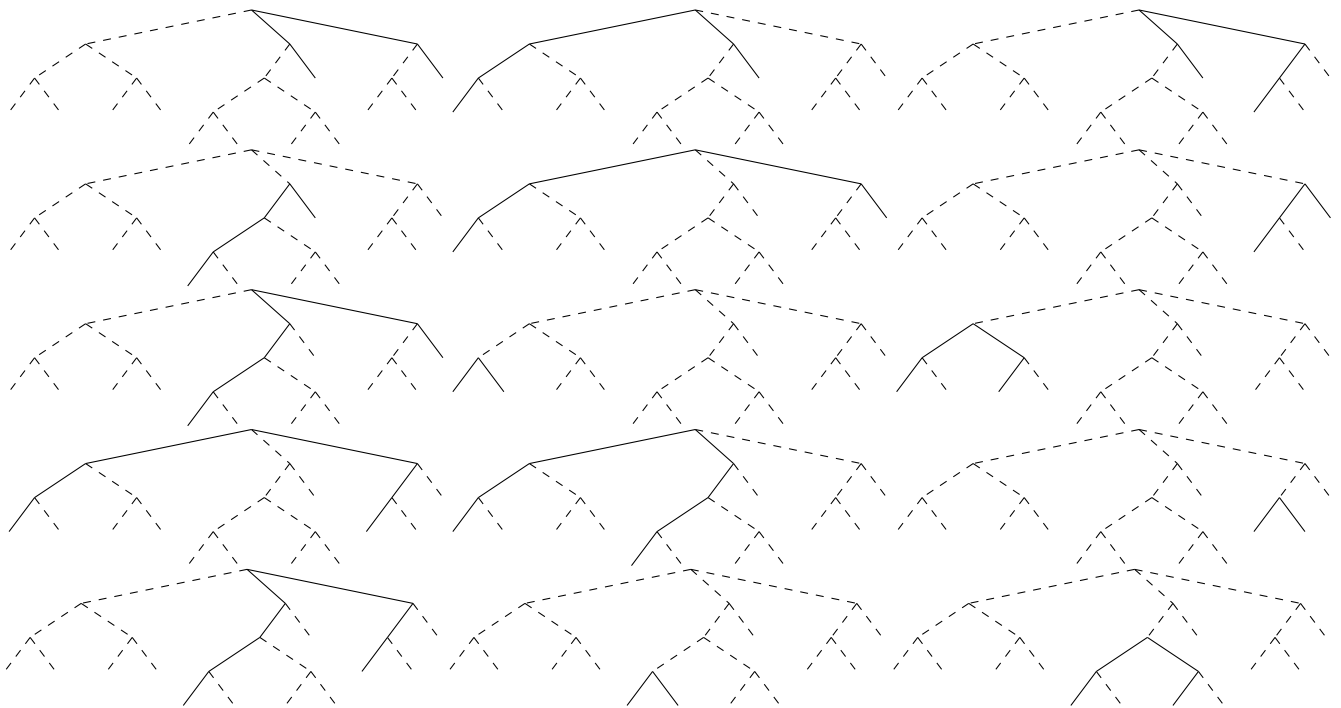
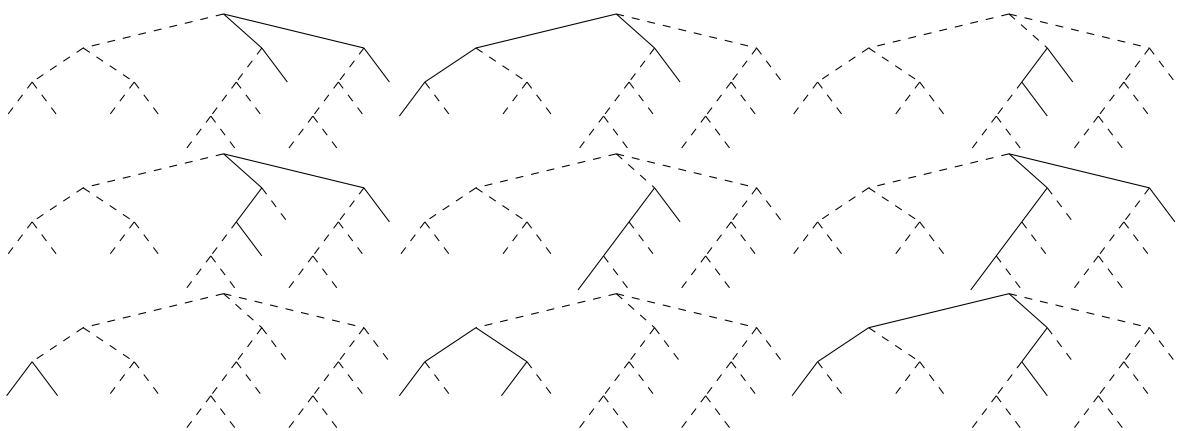


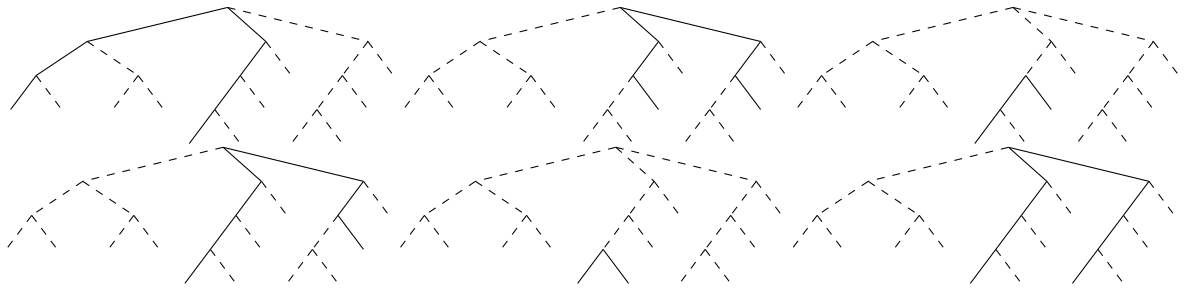
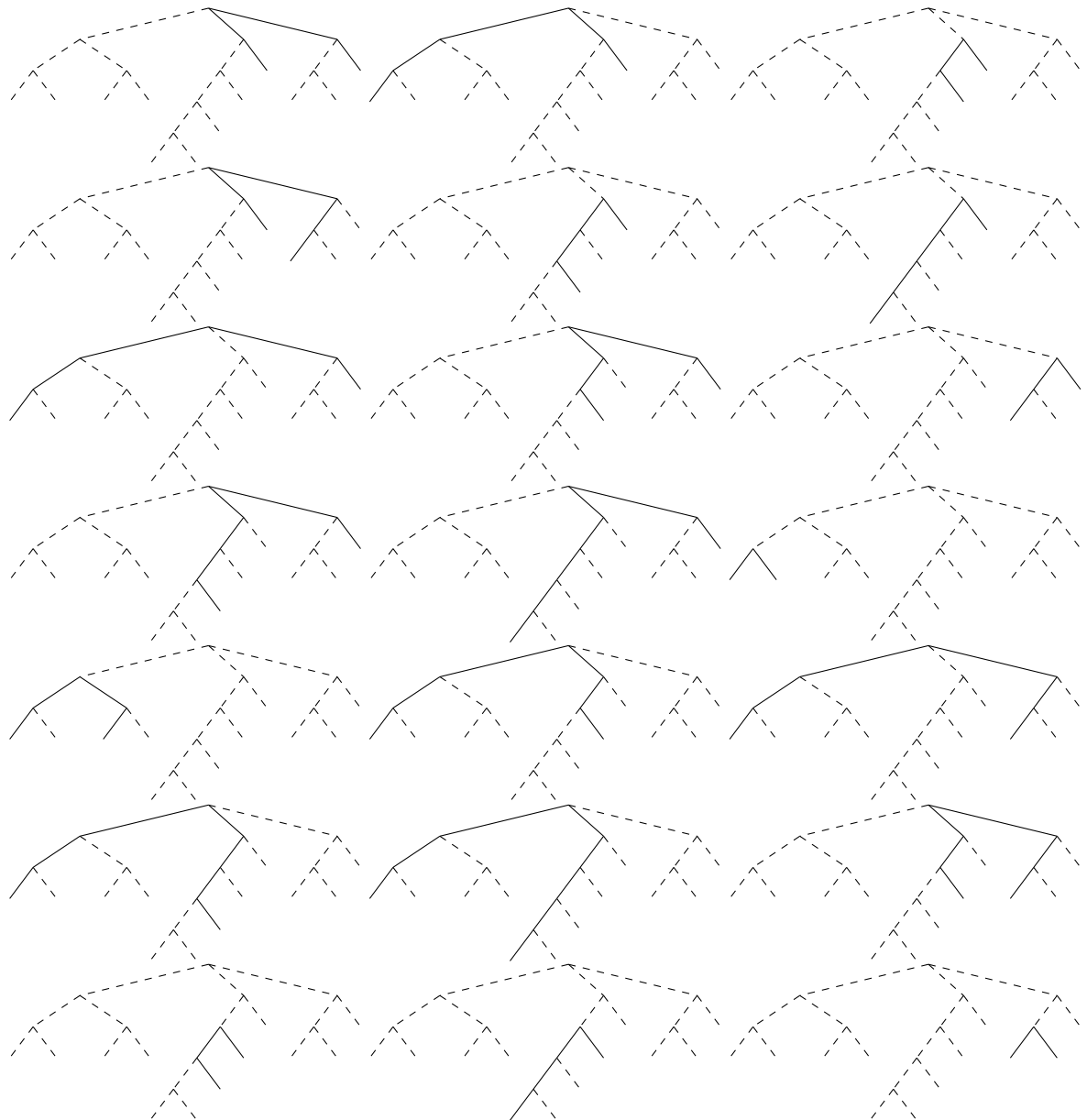
## Topology 546

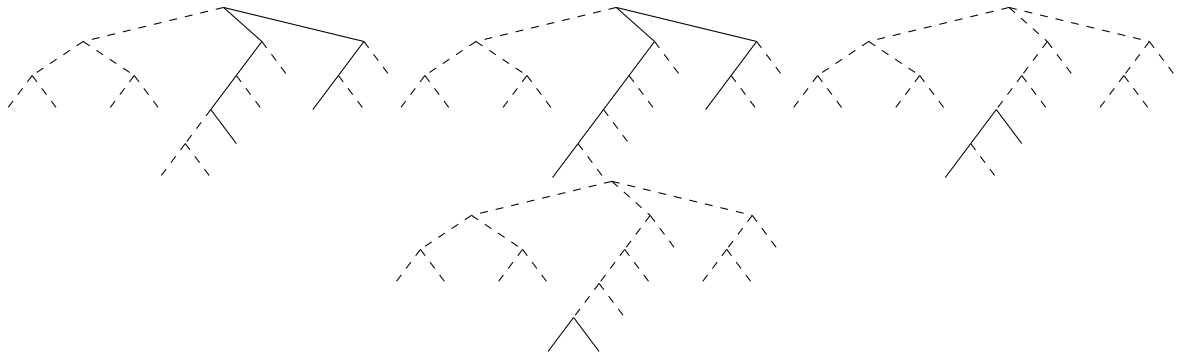
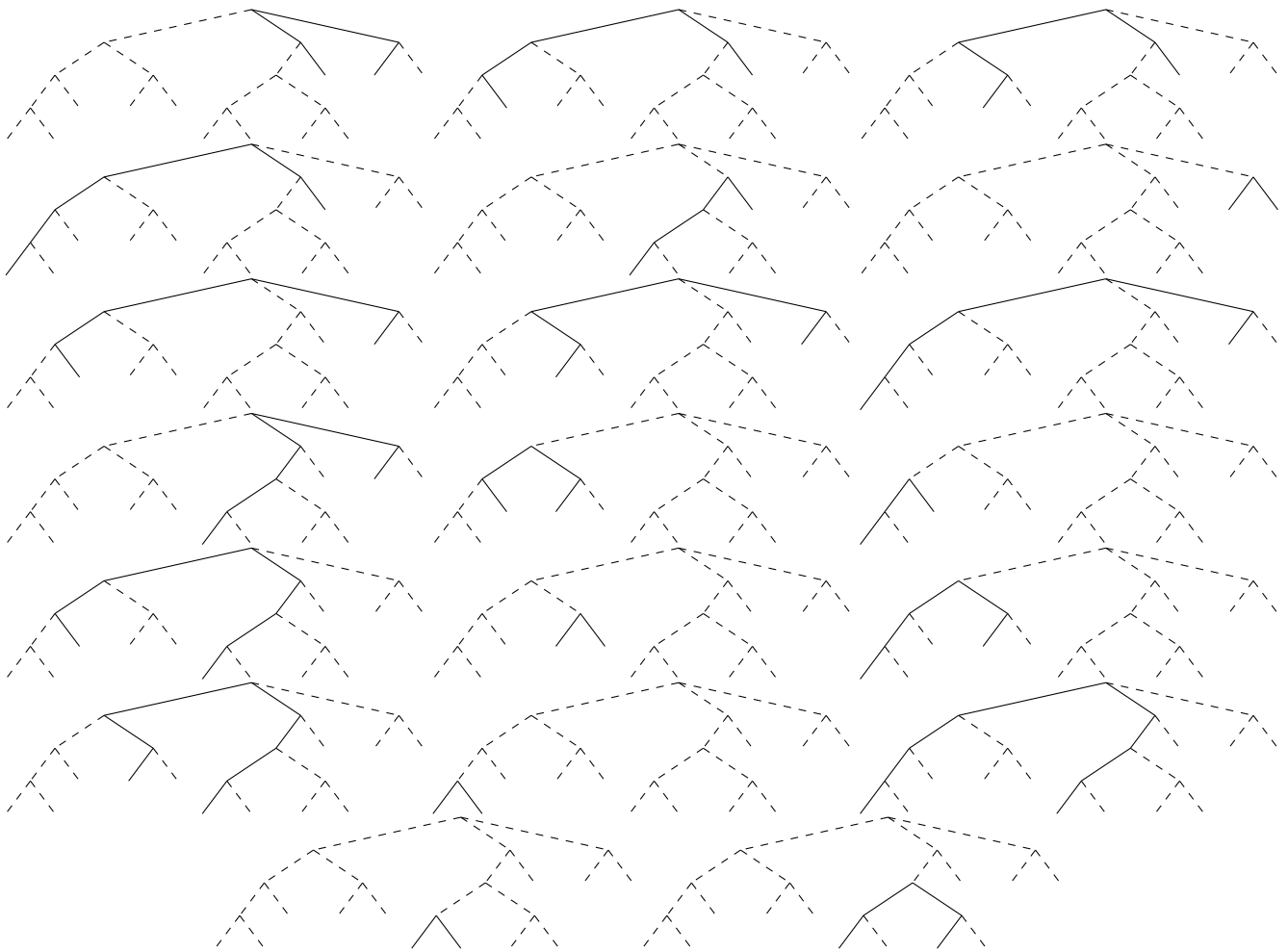
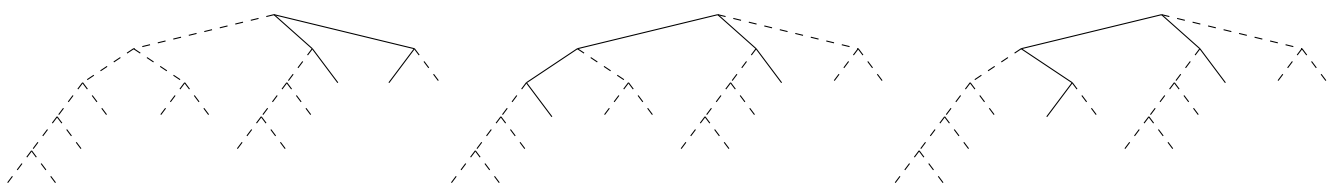


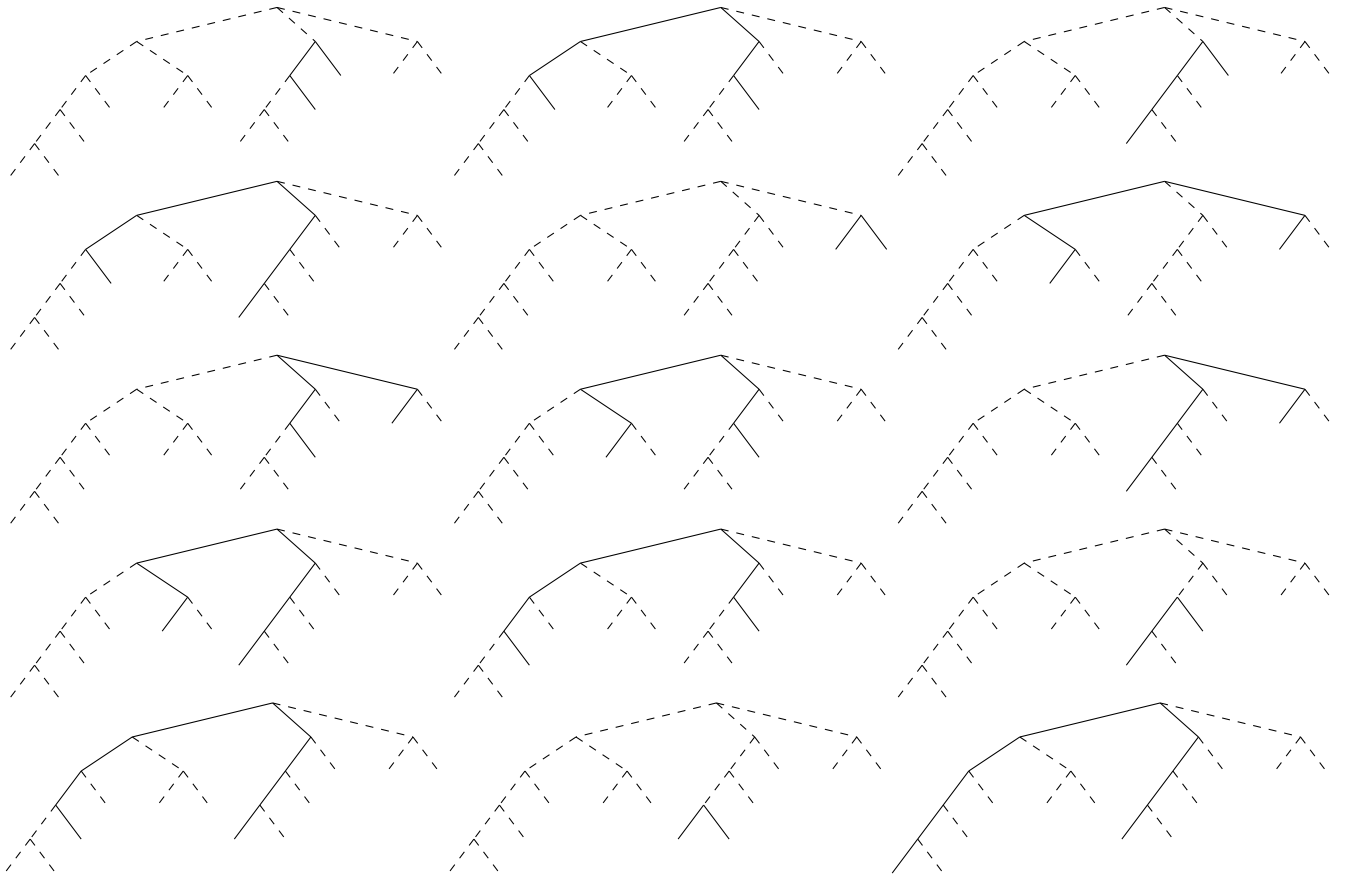
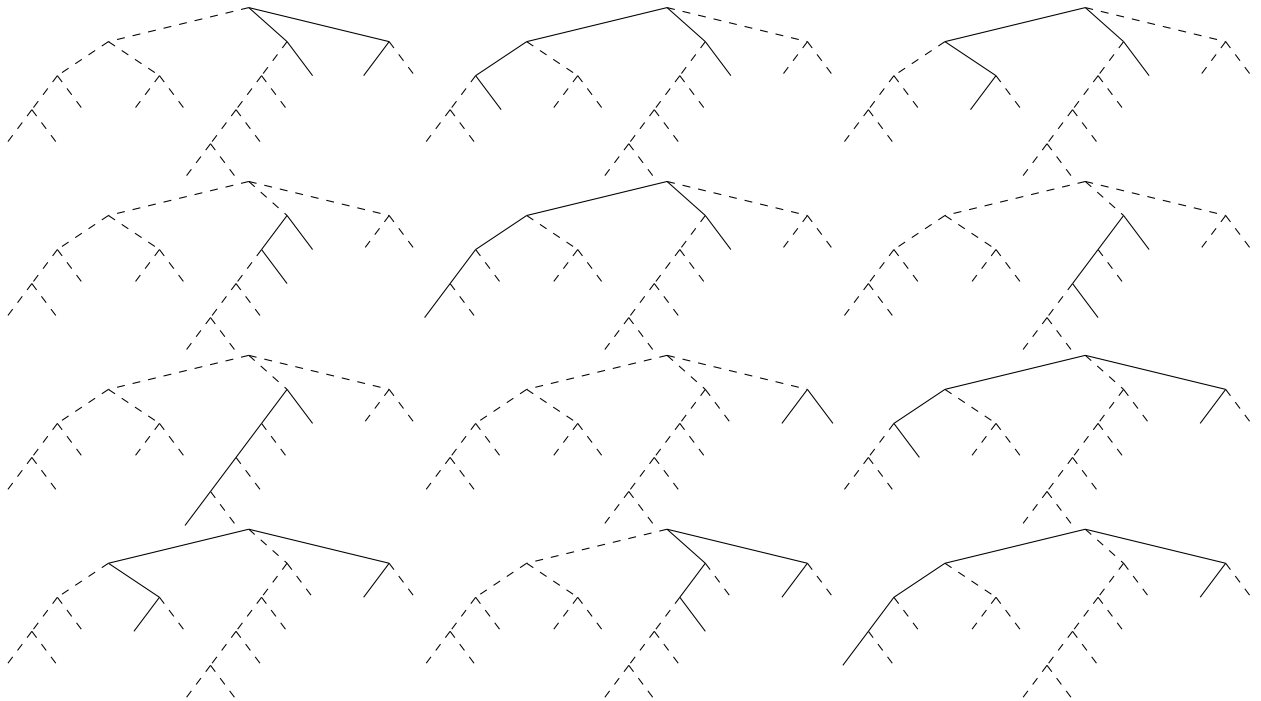
**Topology 547****Topology 548**

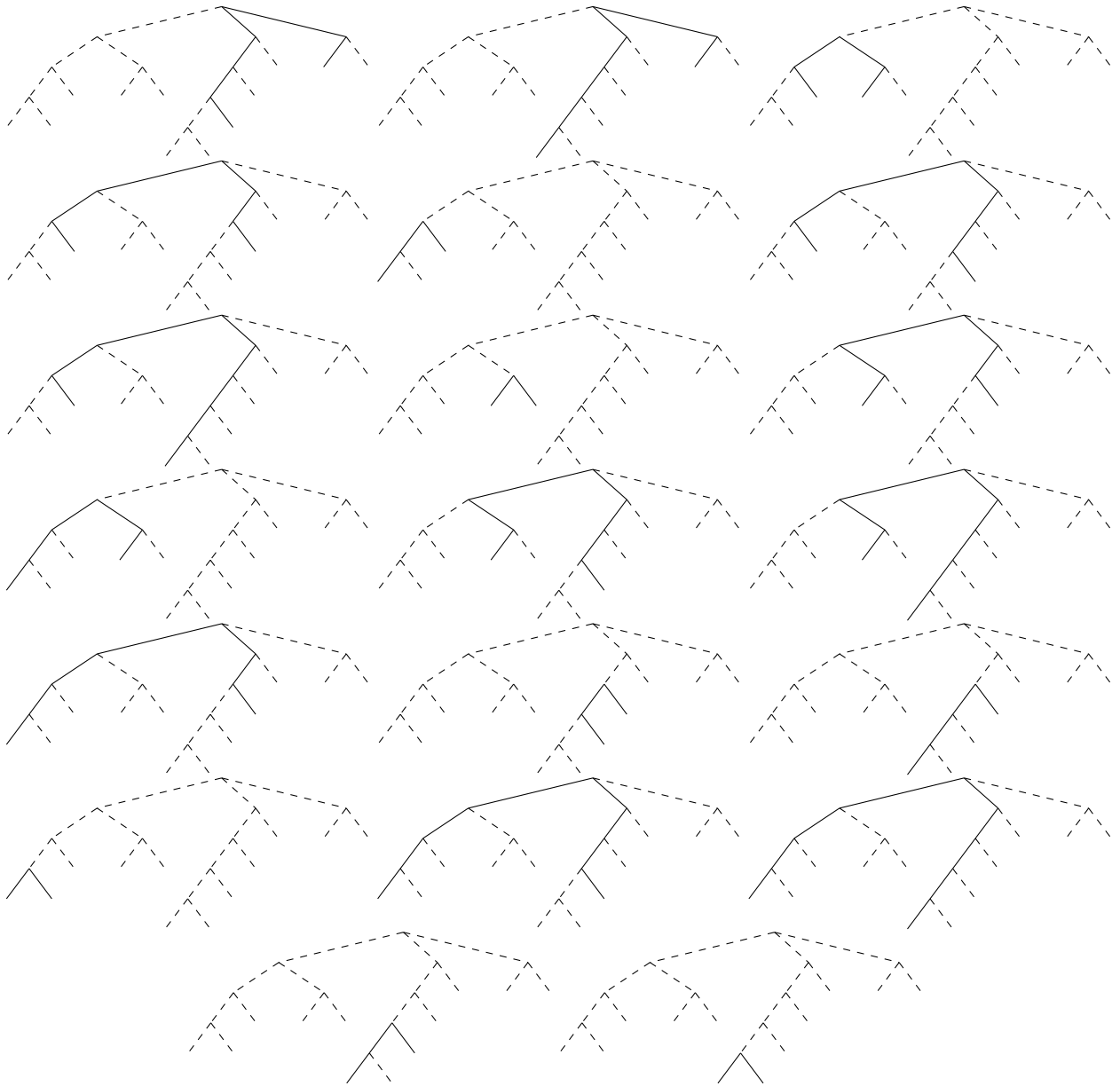
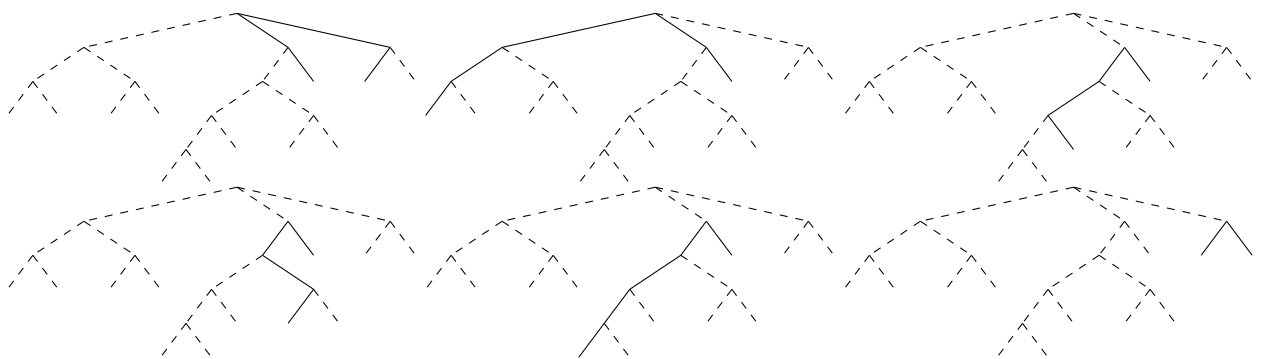
**Topology 549**

**Topology 550****Topology 551**

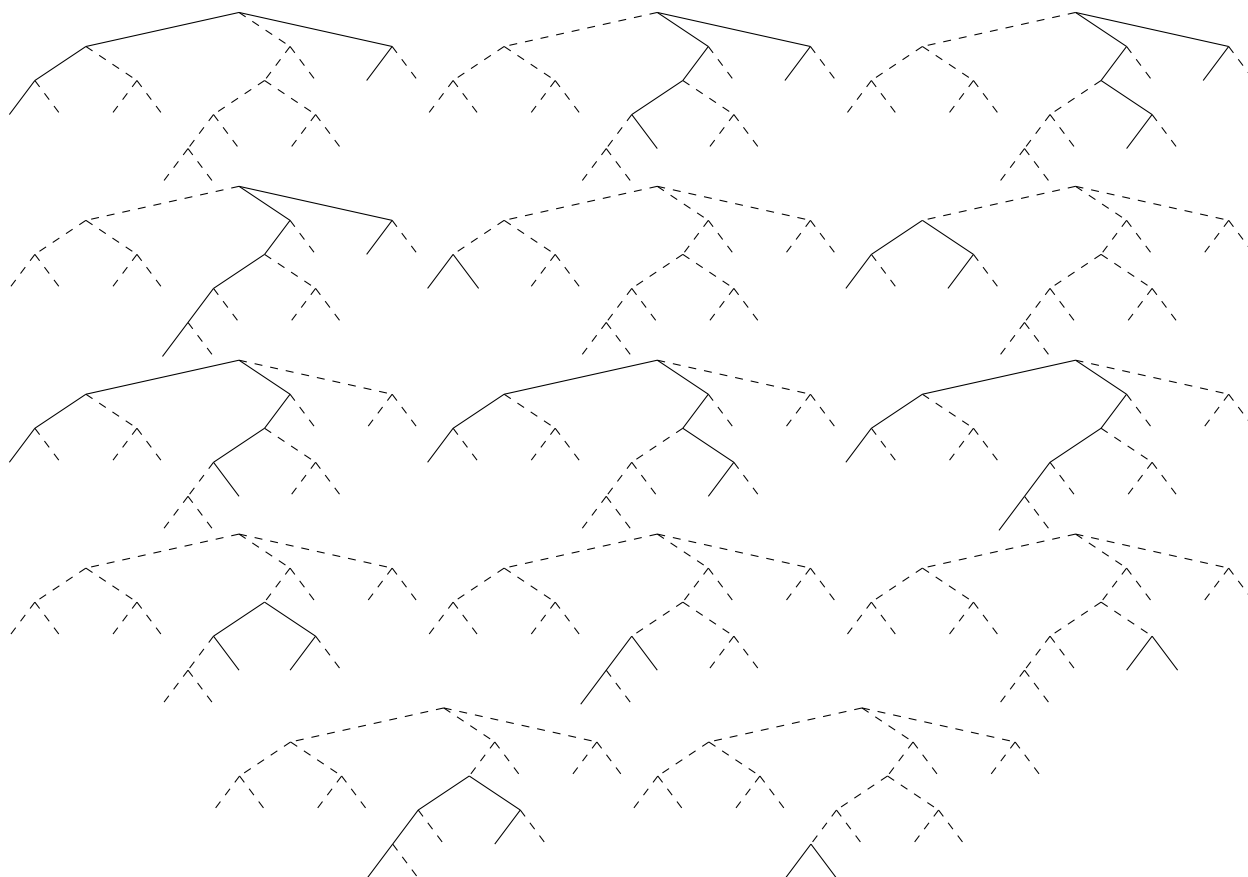
**Topology 552**

**Topology 553****Topology 554**

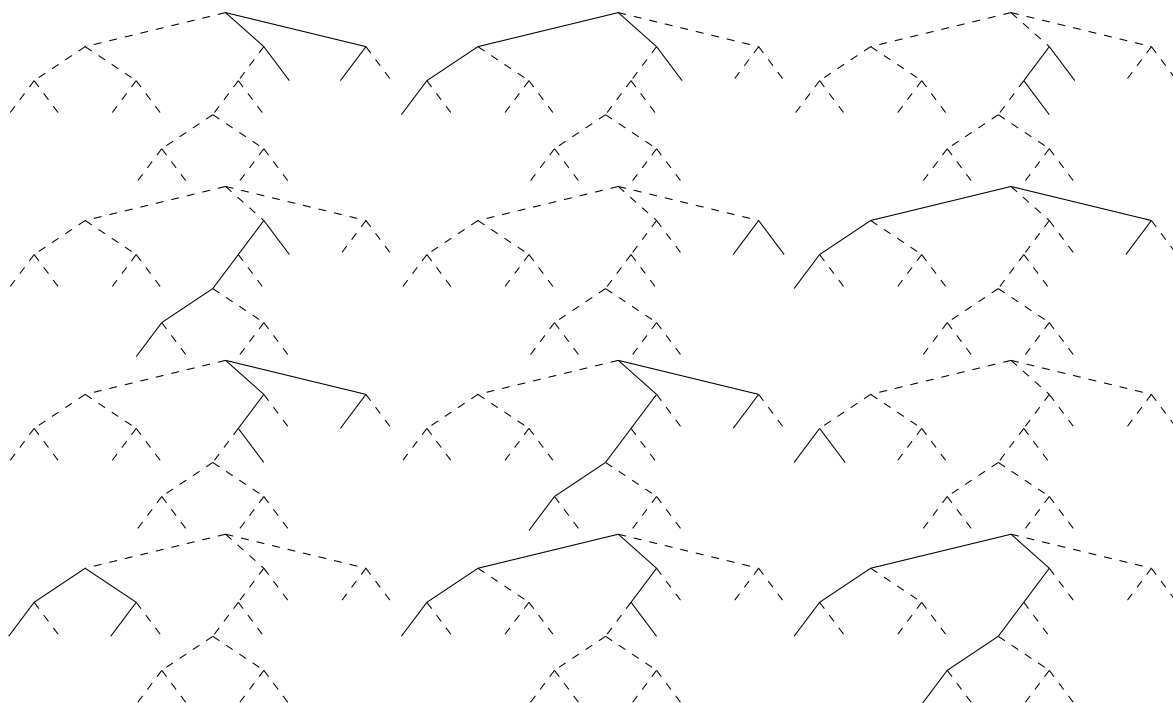
**Topology 555**

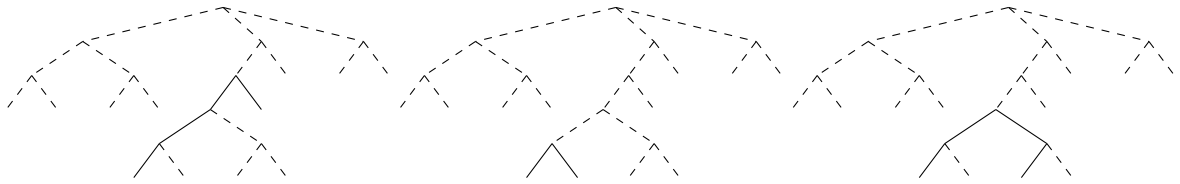
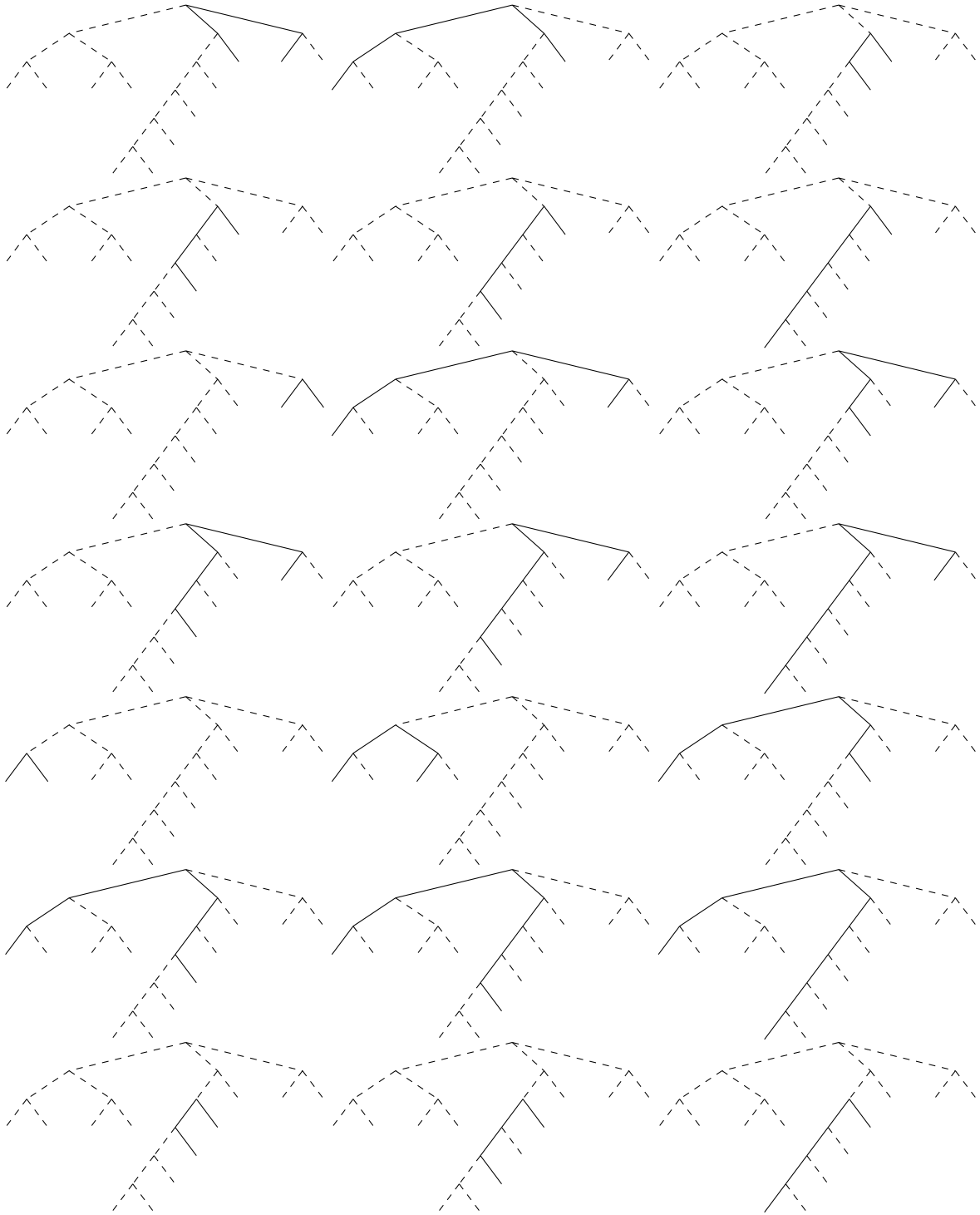
**Topology 556**

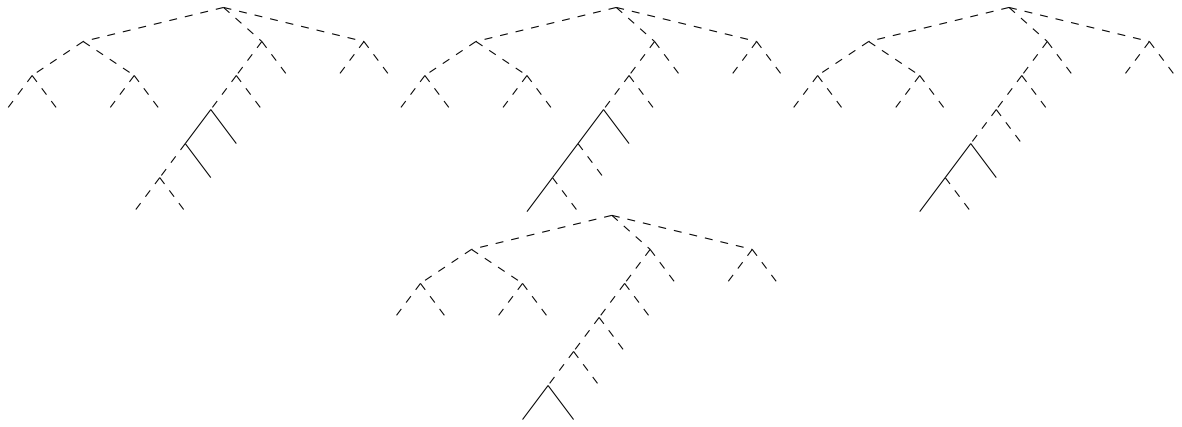
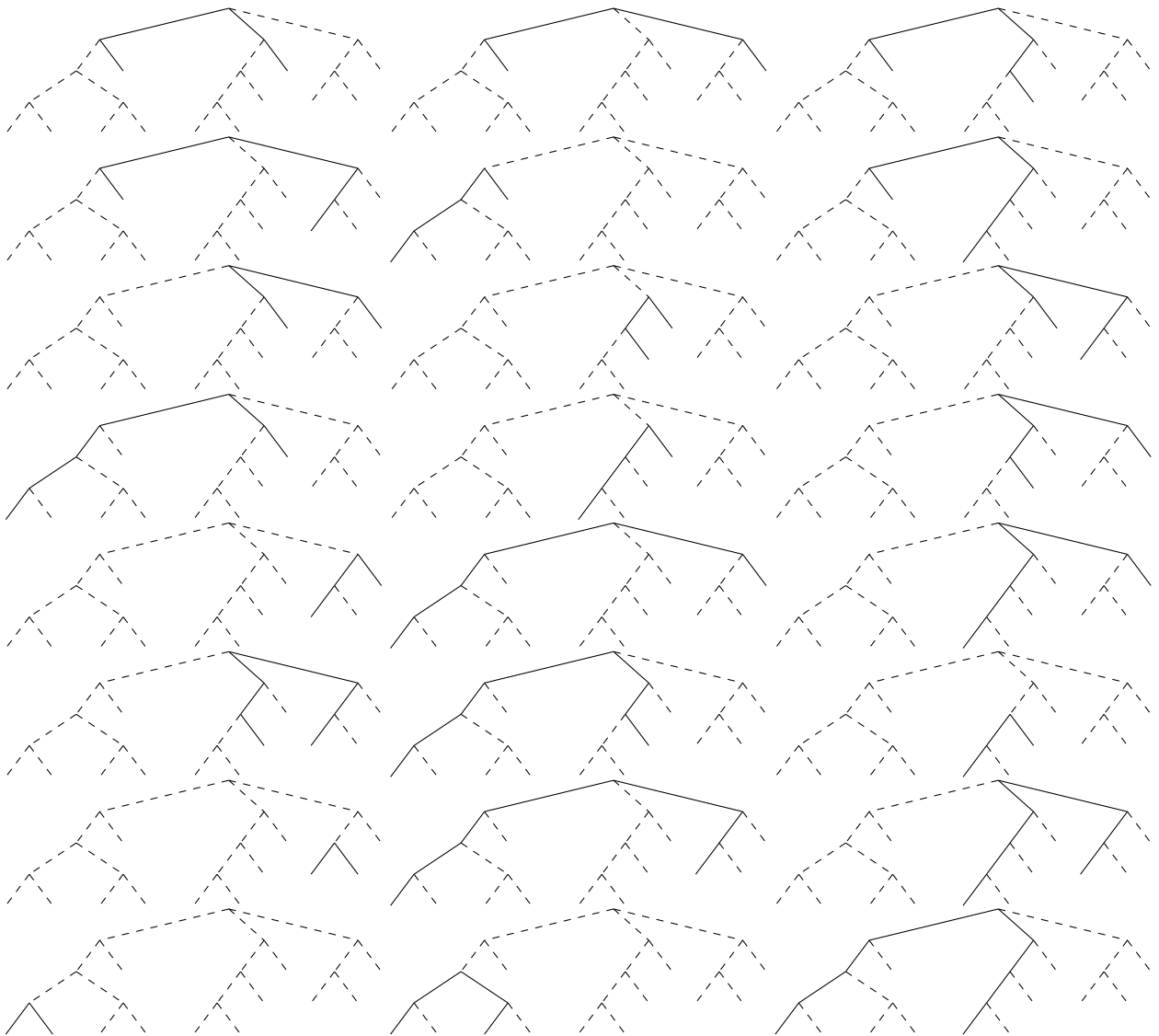


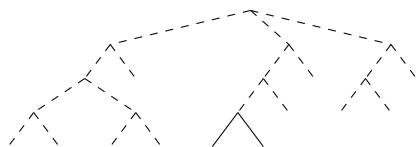
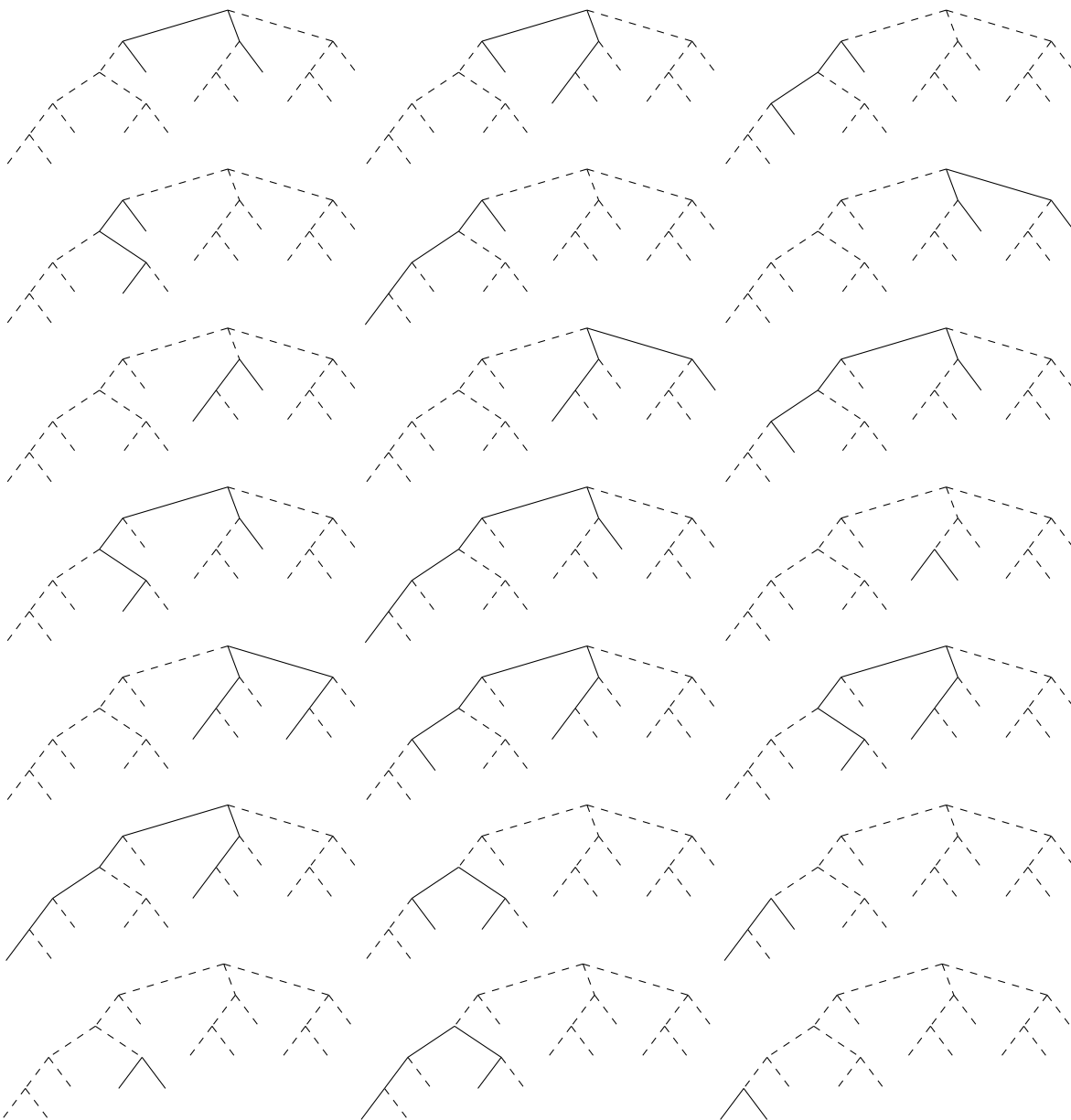


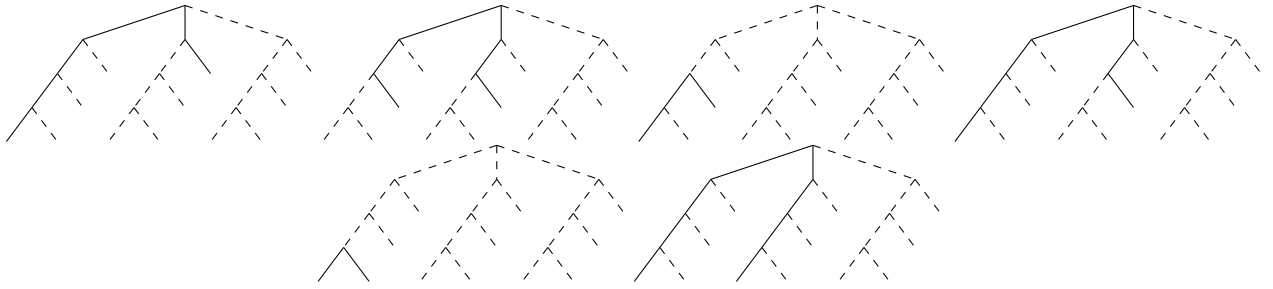
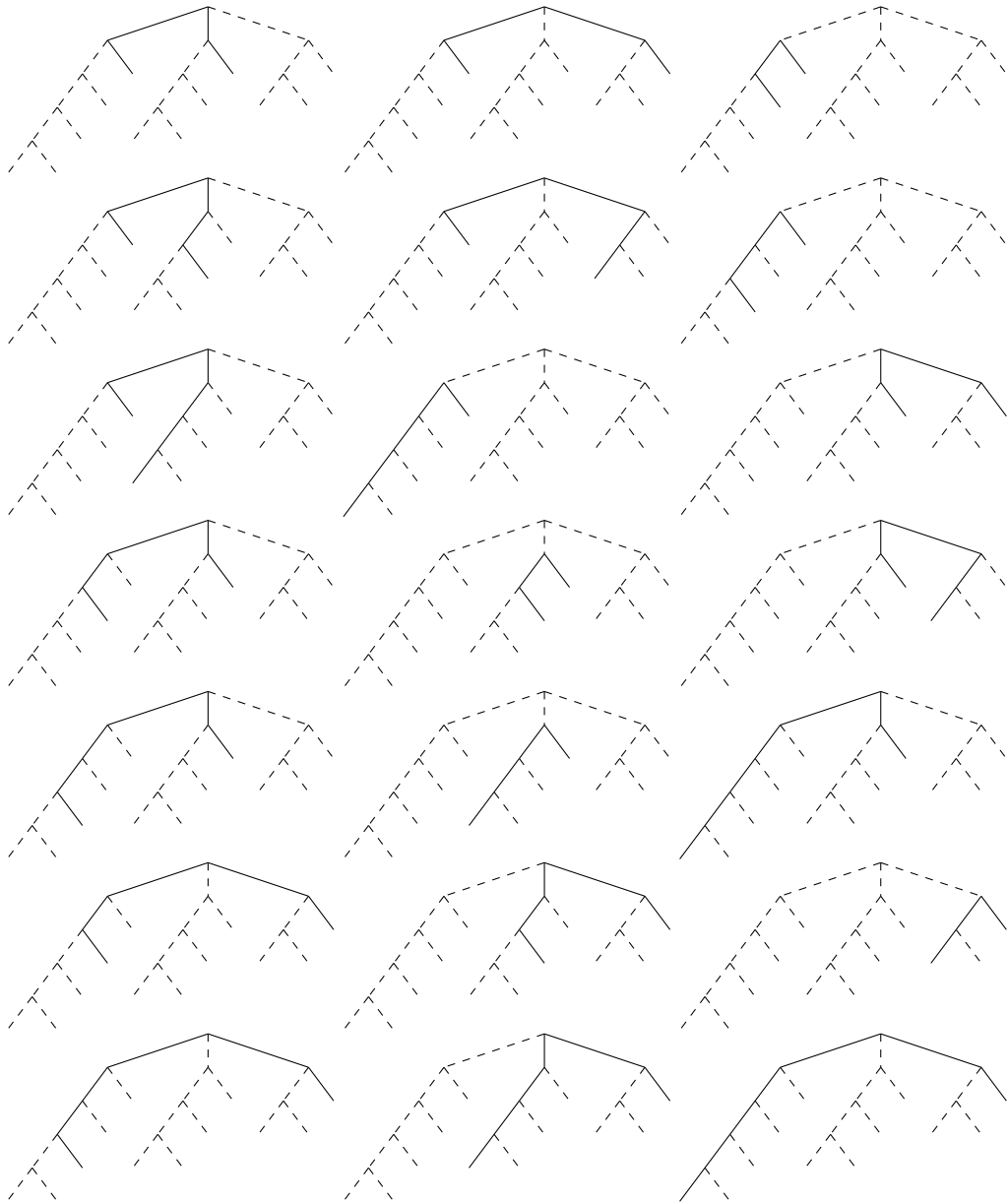
**Topology 557**

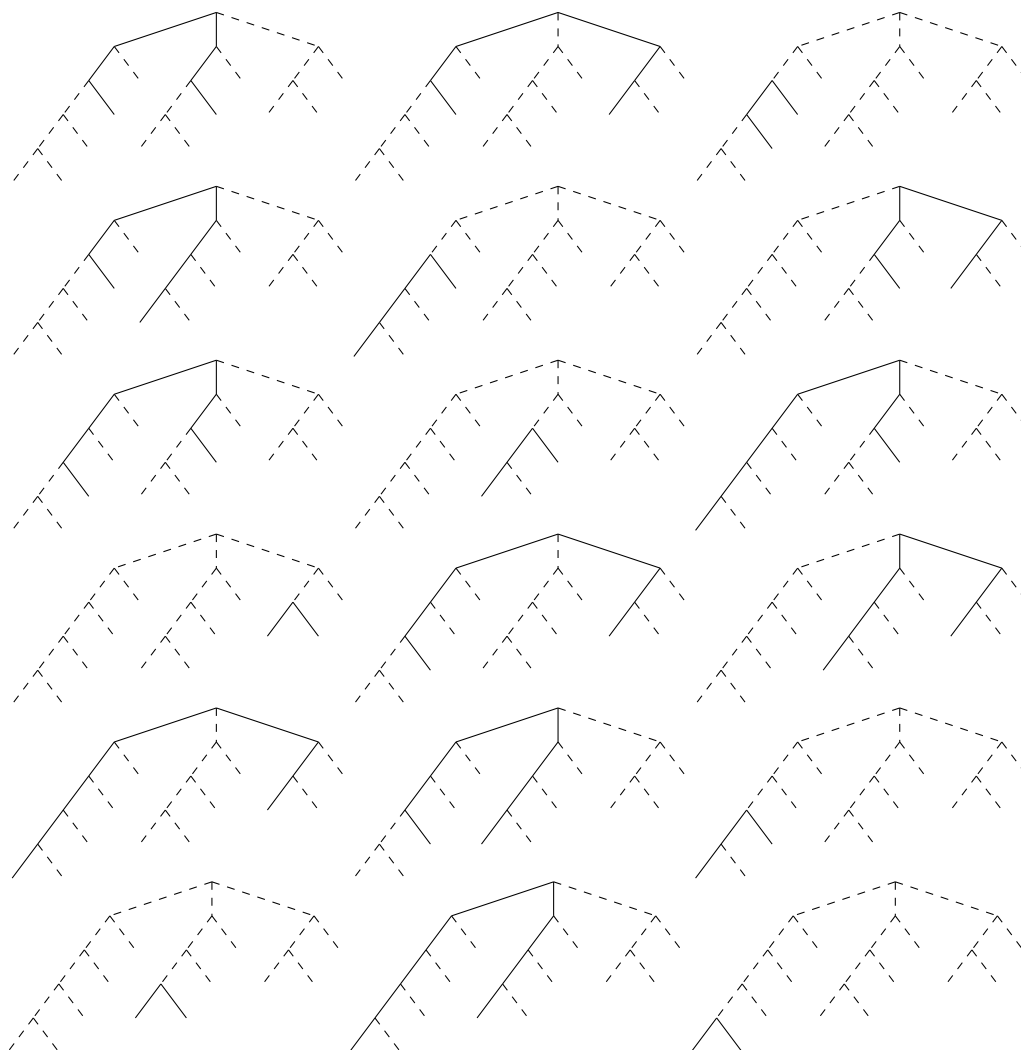
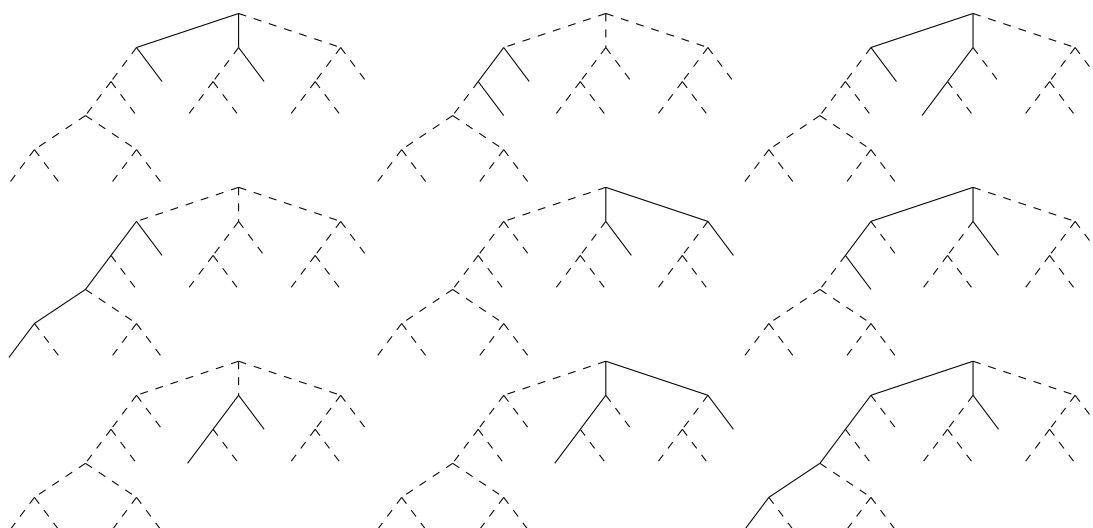


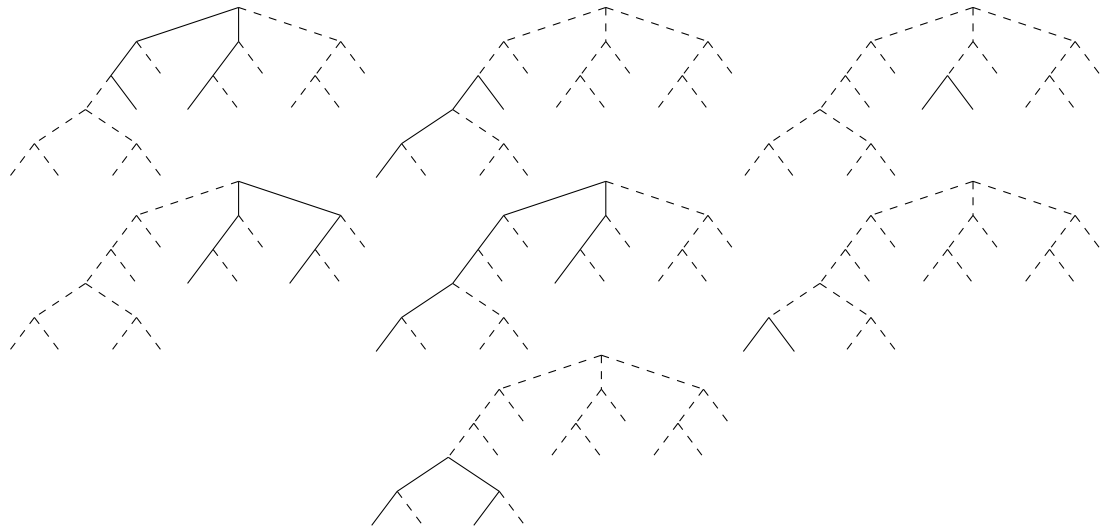
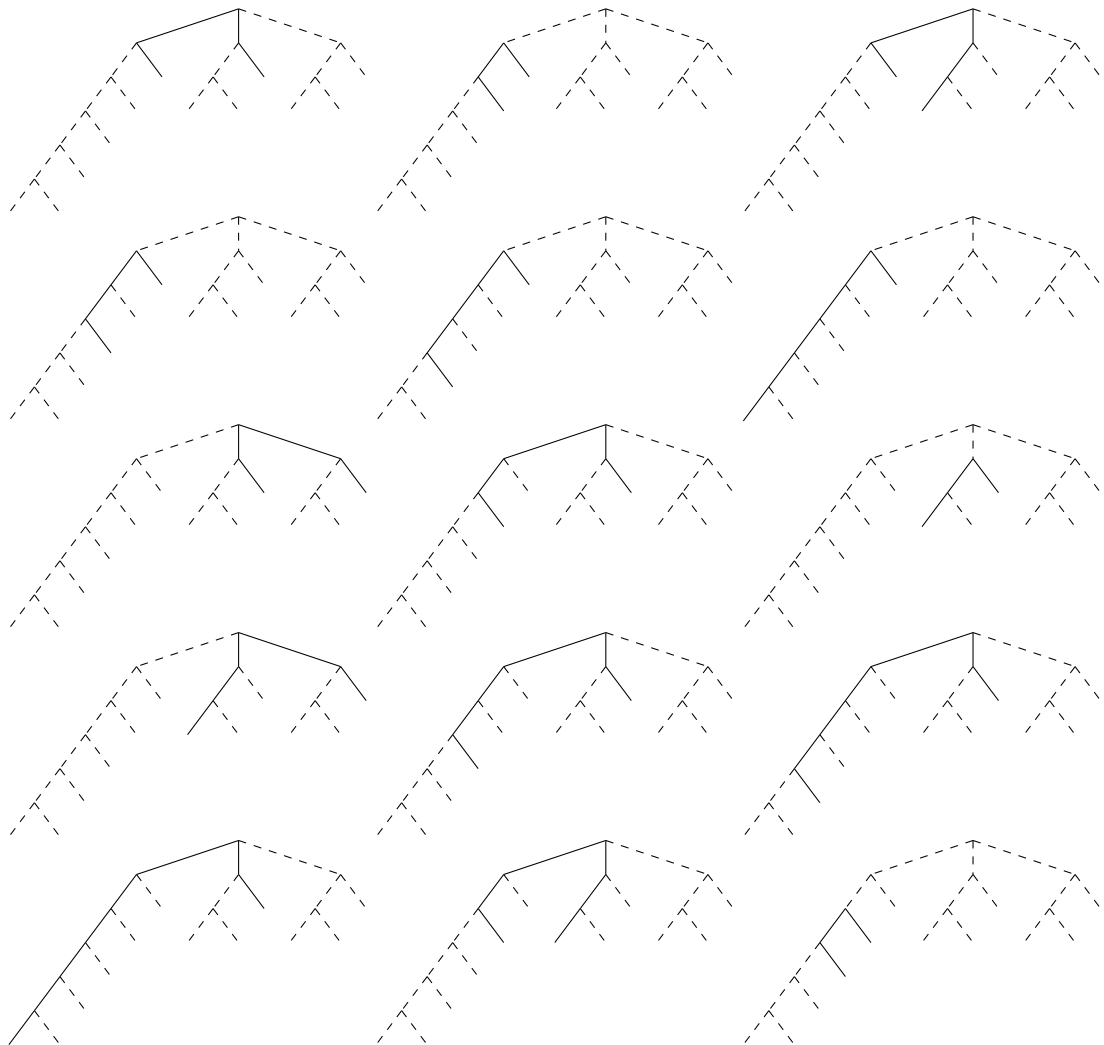
**Topology 558**

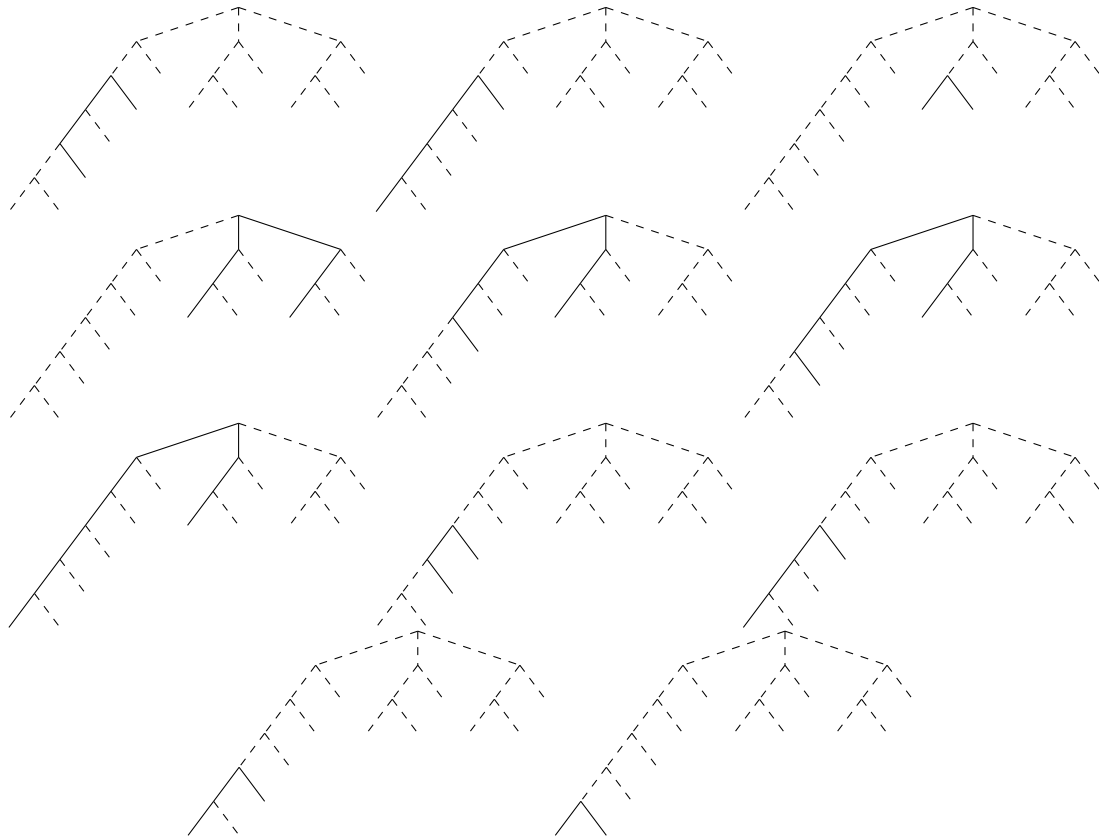
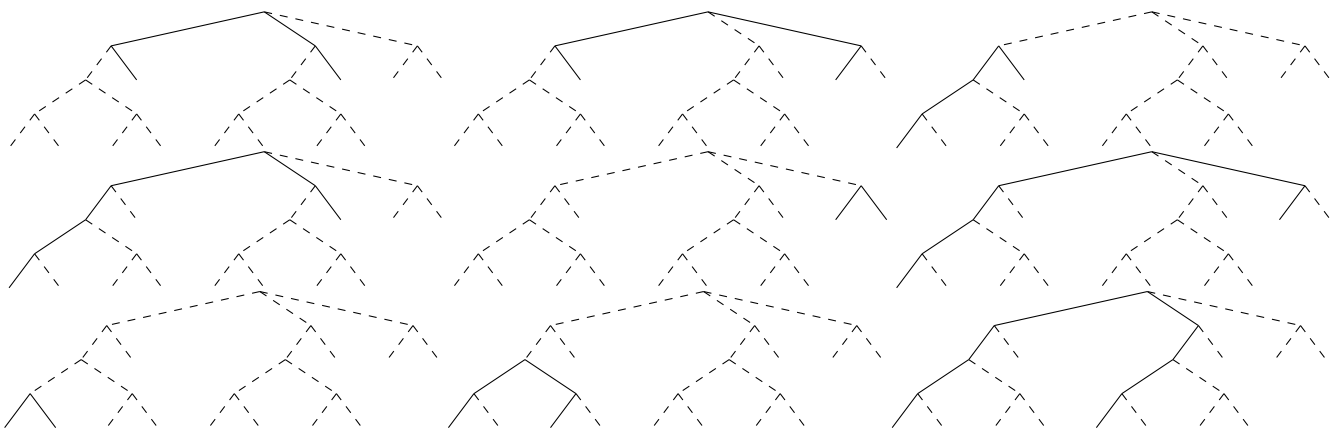
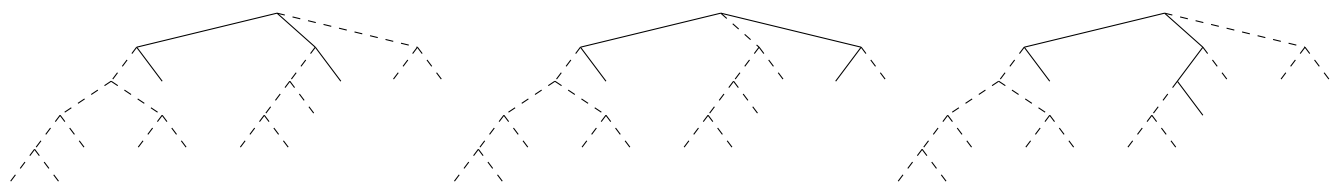
**Topology 559**

**Topology 560****Topology 561**

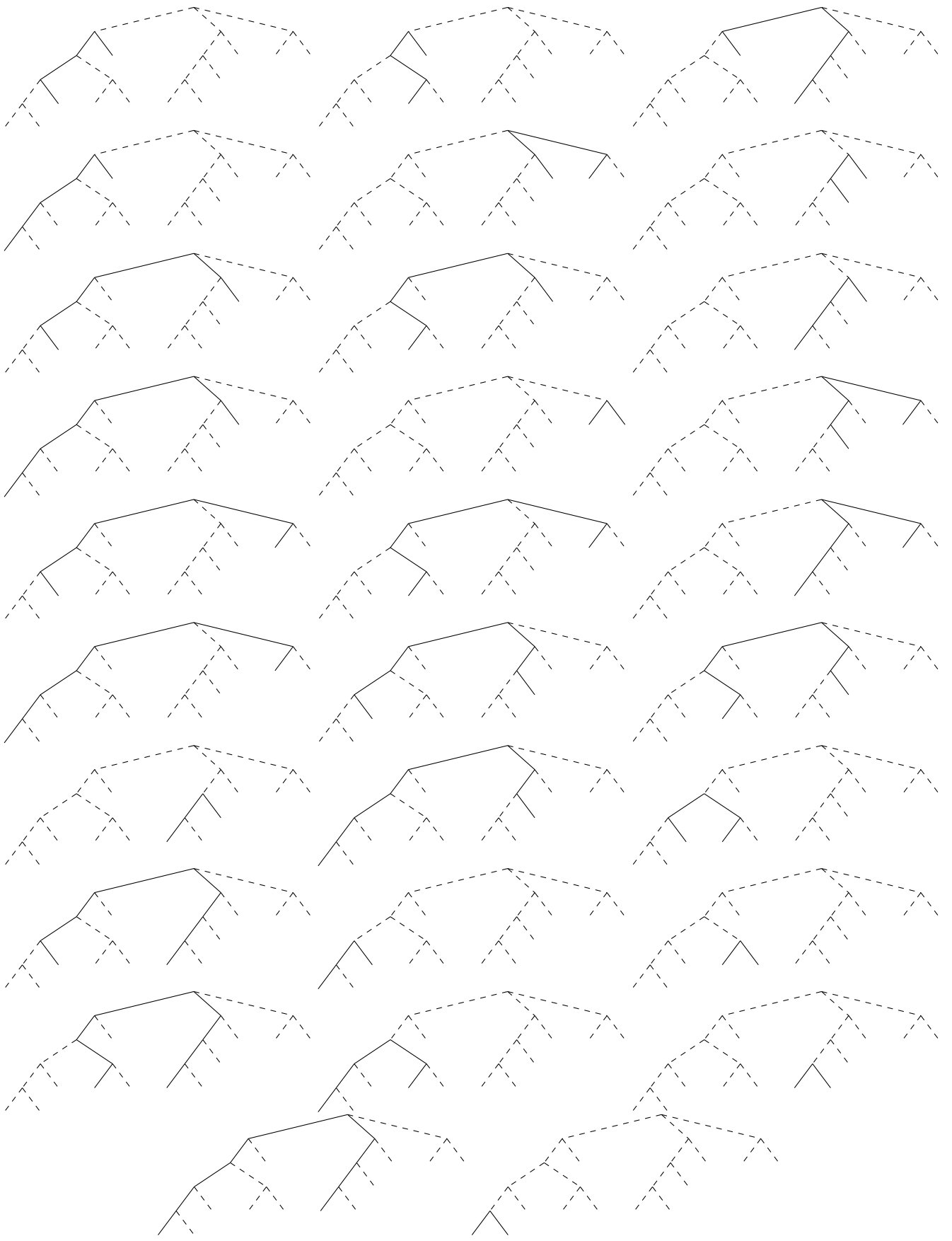
**Topology 562**

**Topology 563**

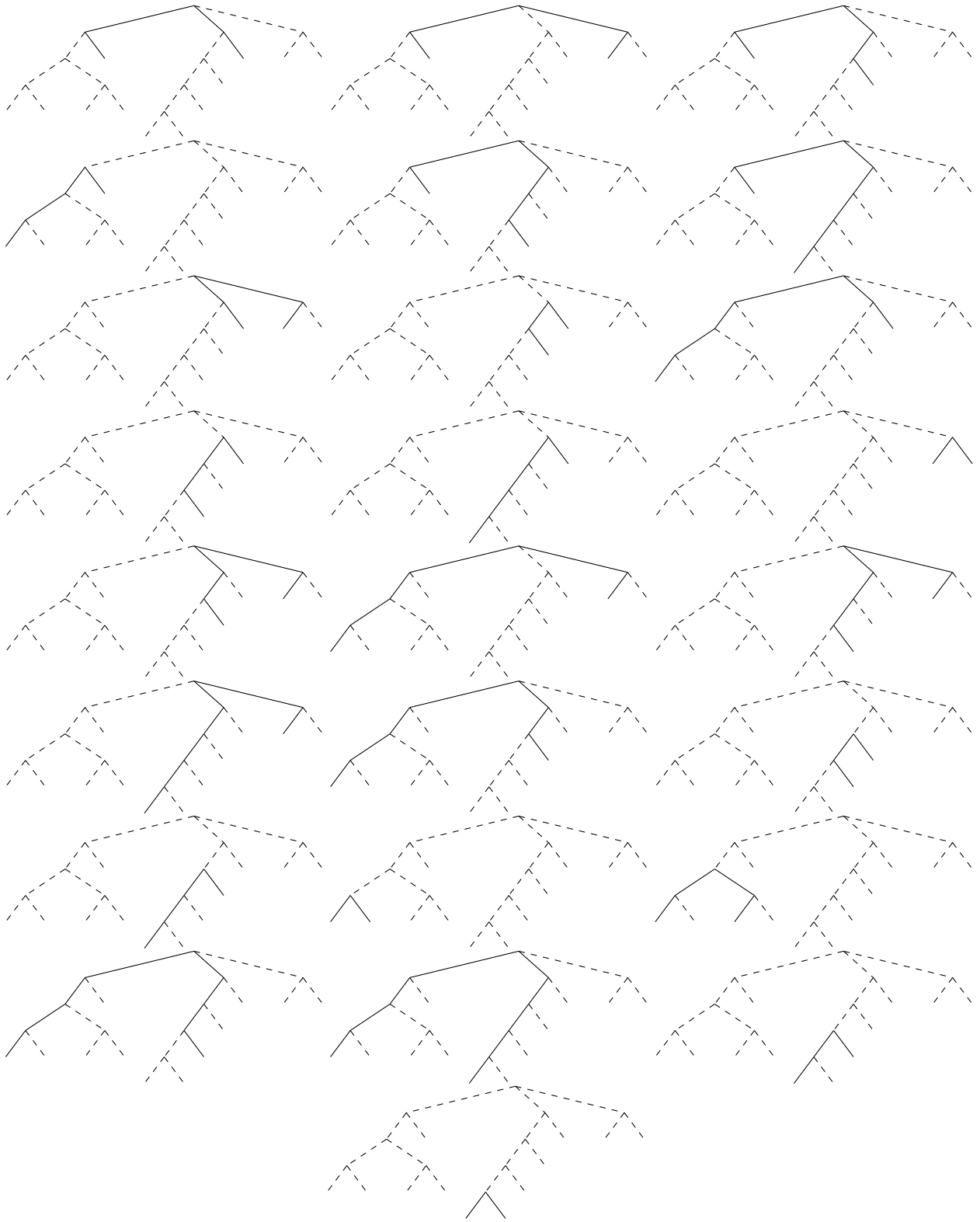
**Topology 564**

**Topology 565****Topology 566**

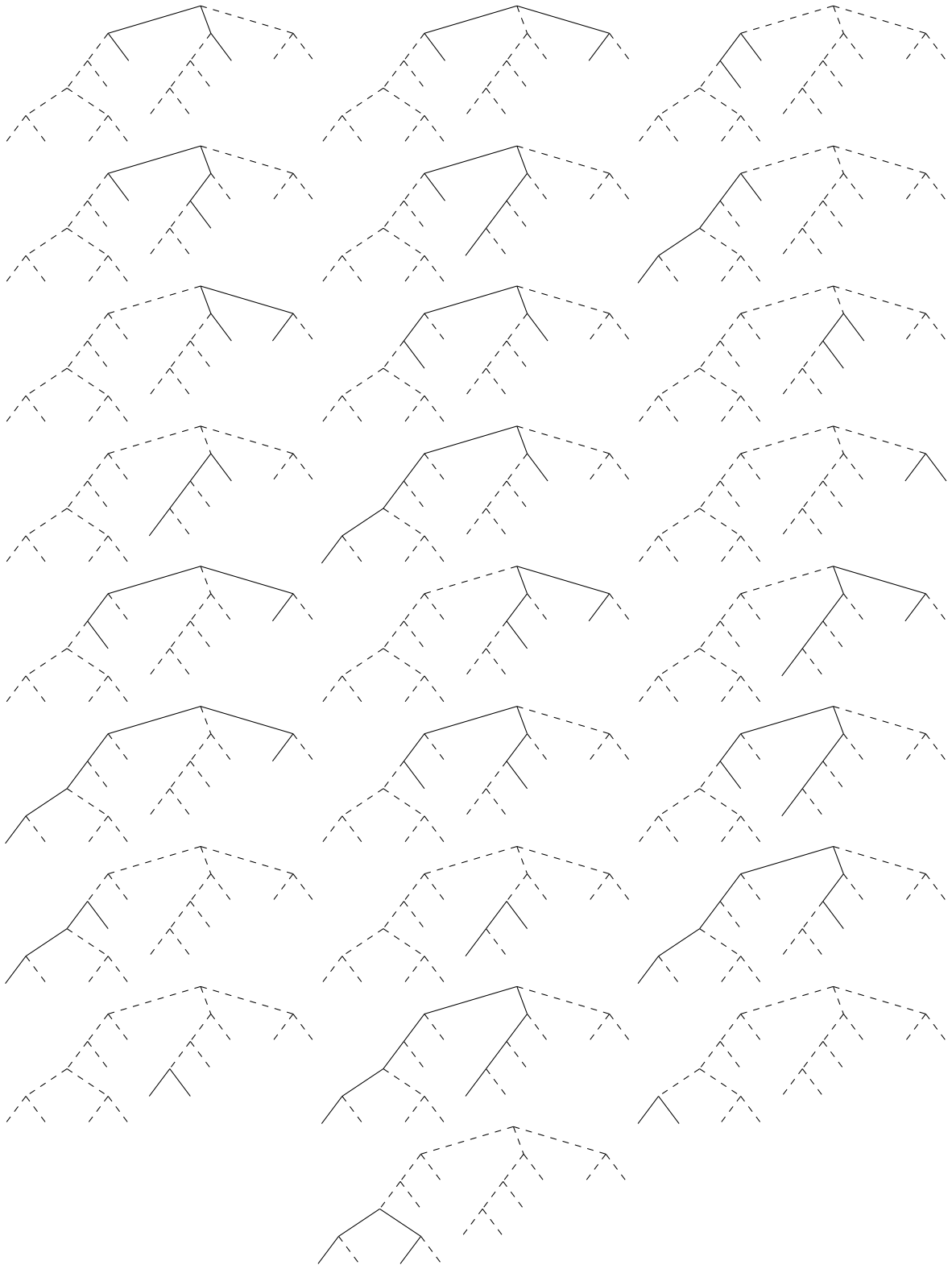


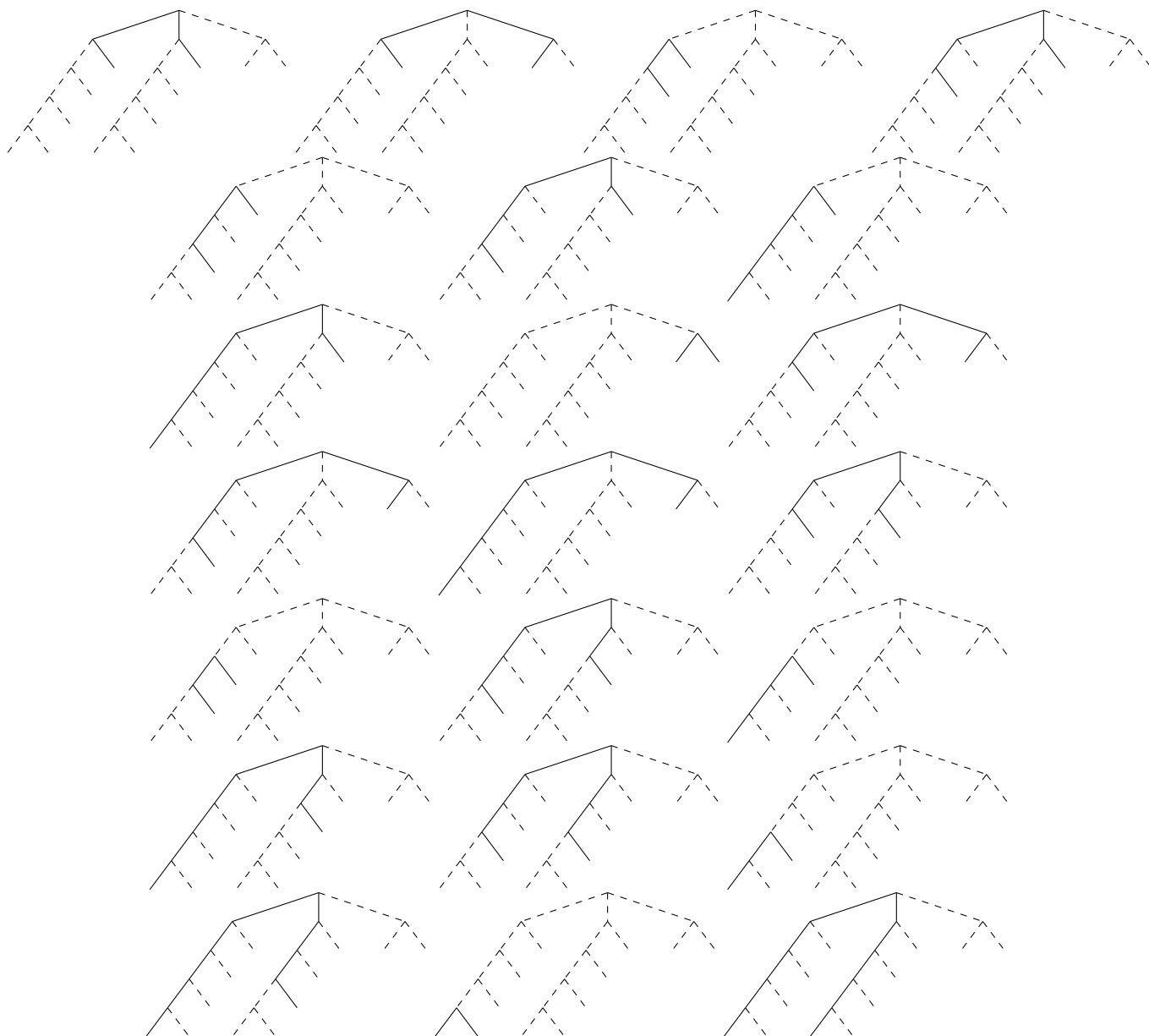
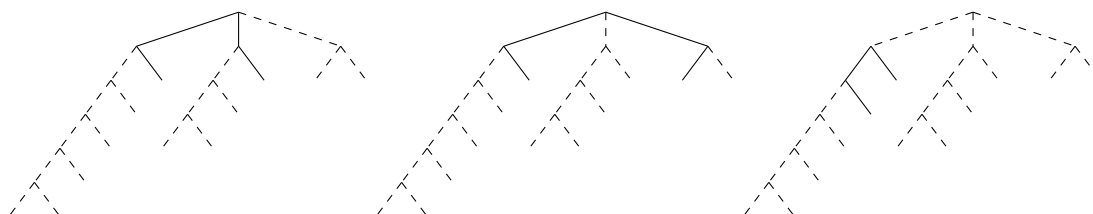


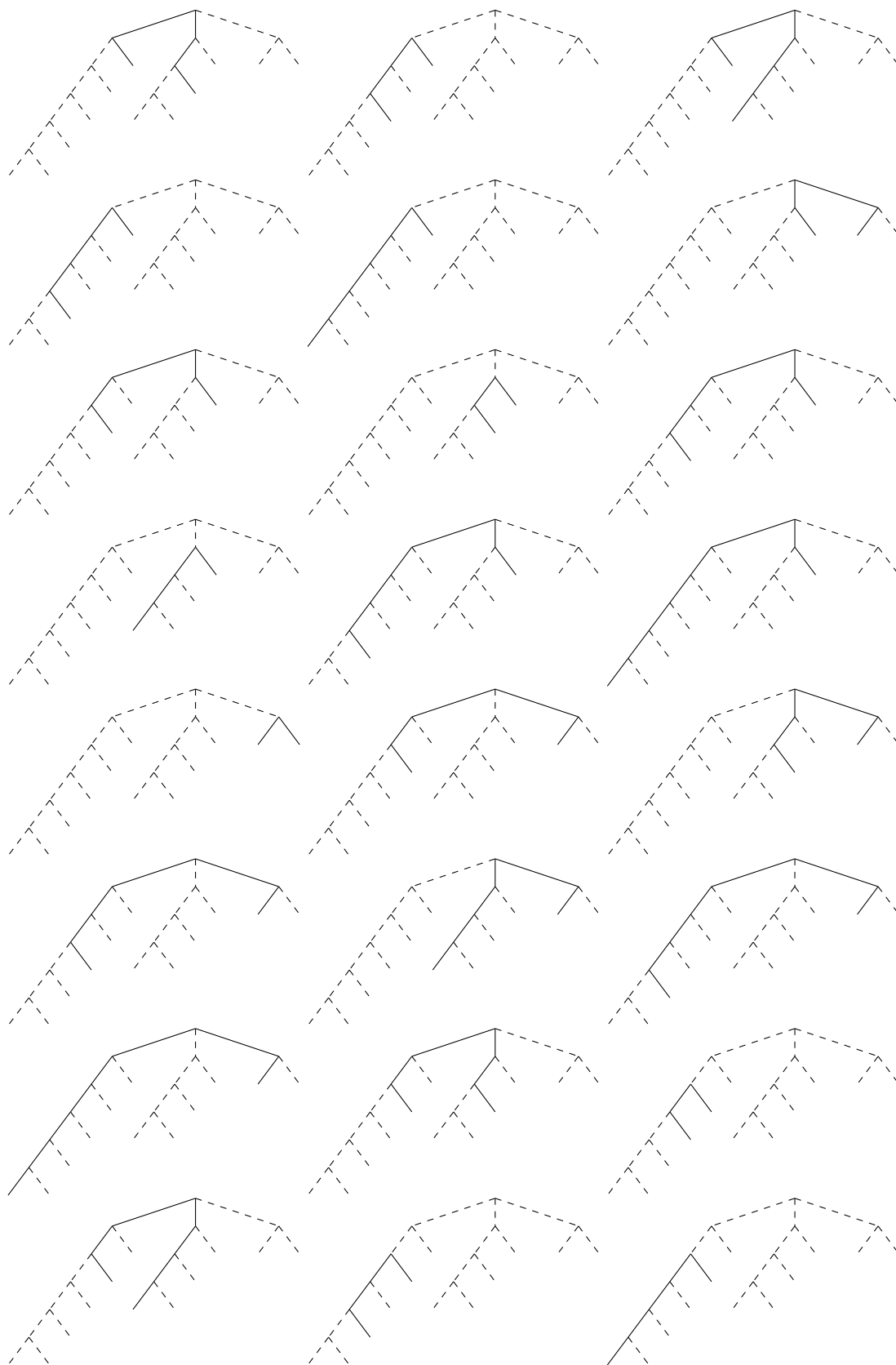
## Topology 567

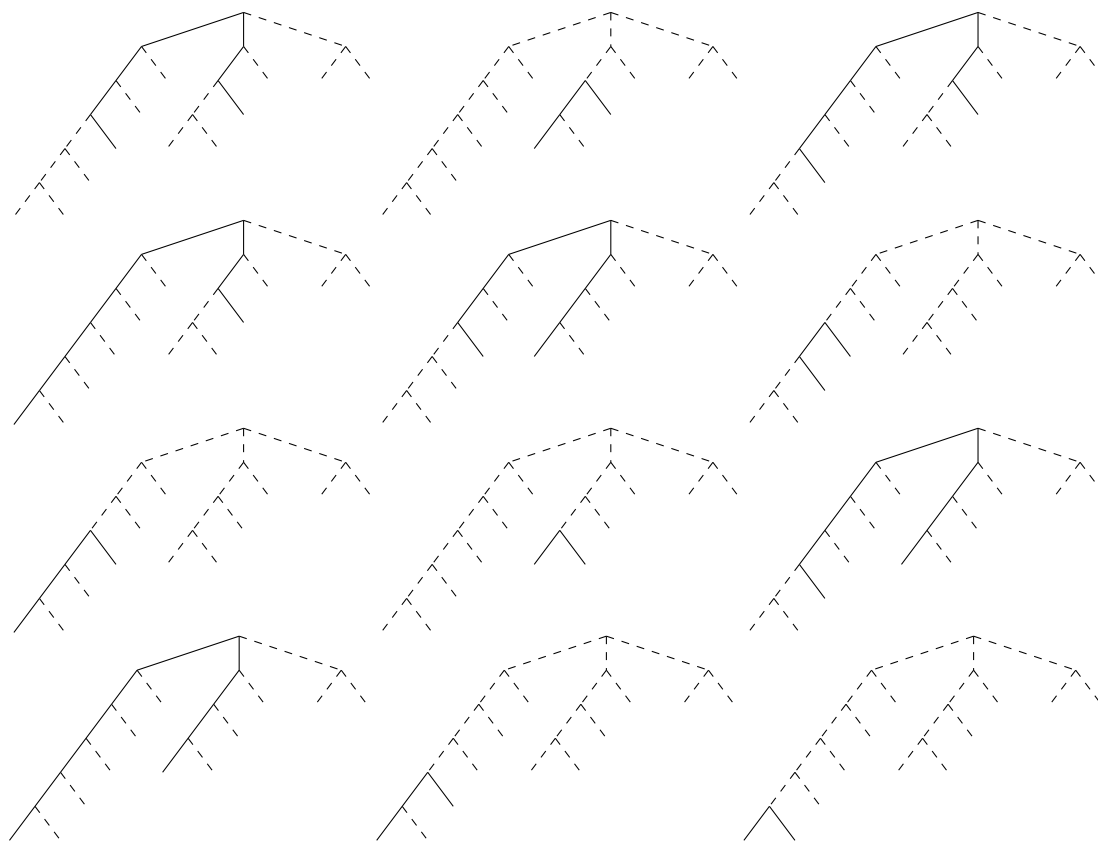
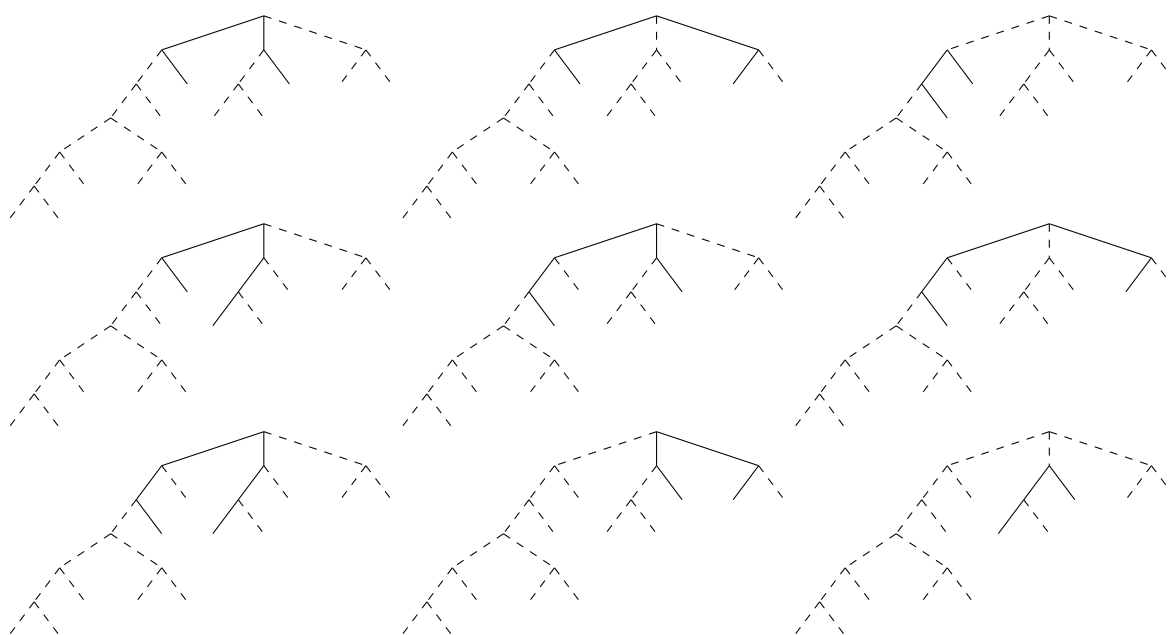


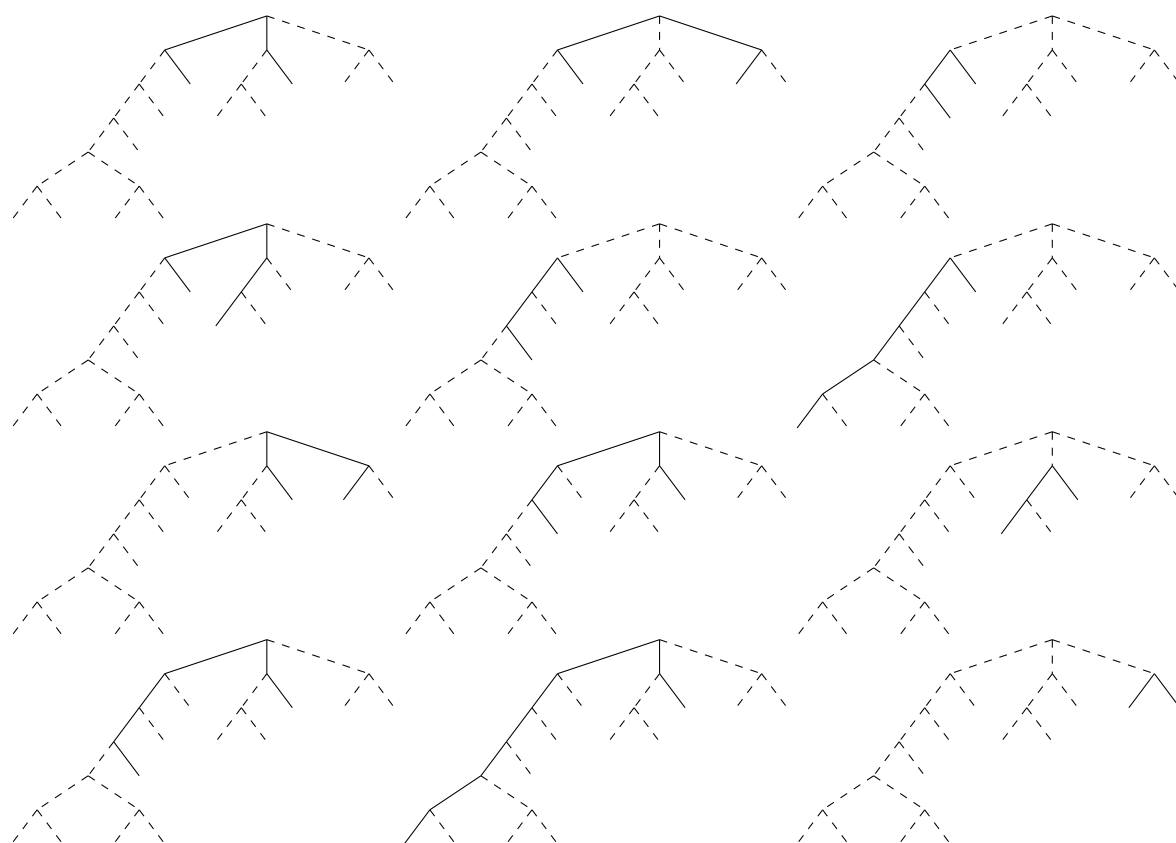
## Topology 568

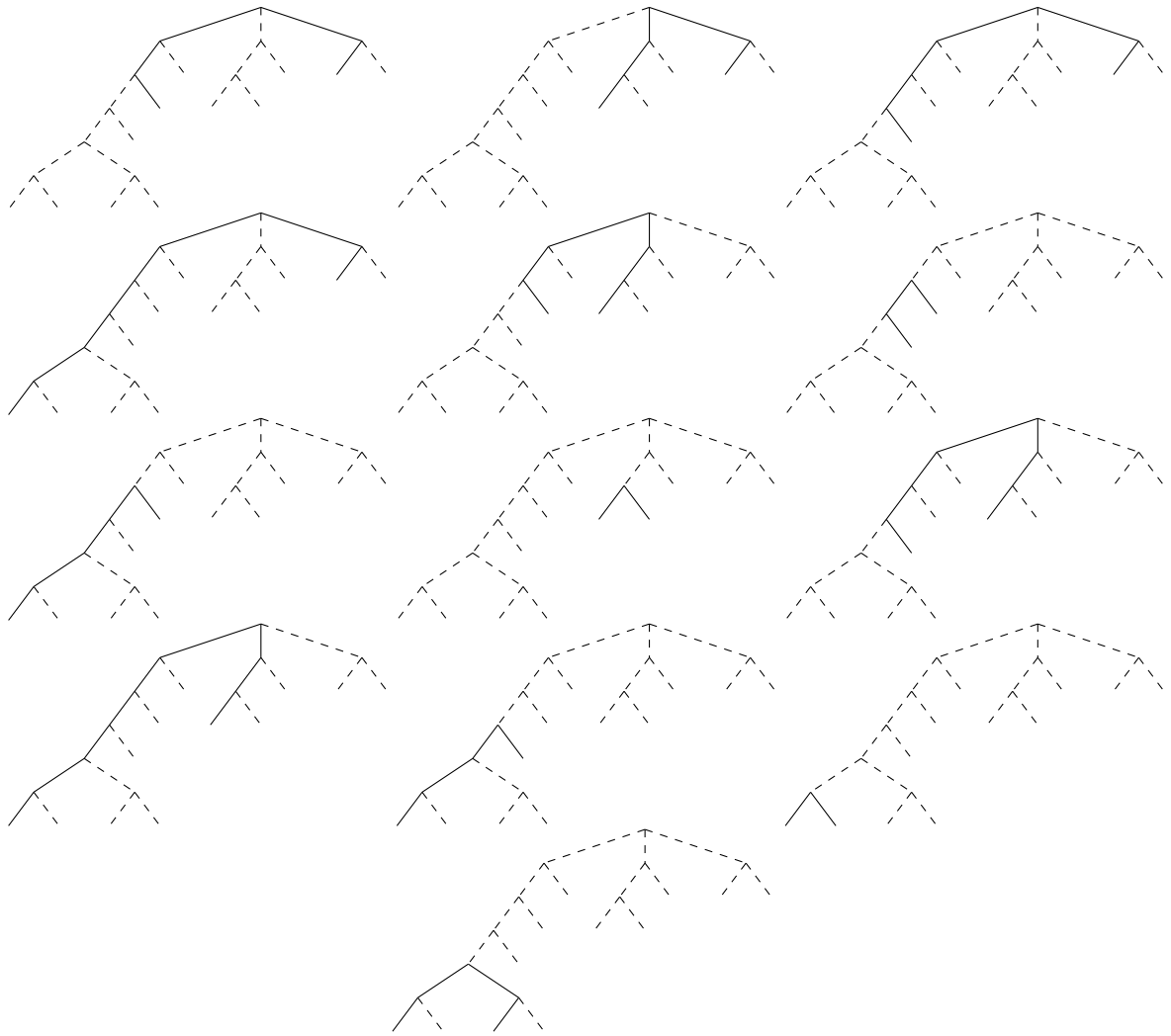


**Topology 569****Topology 570**

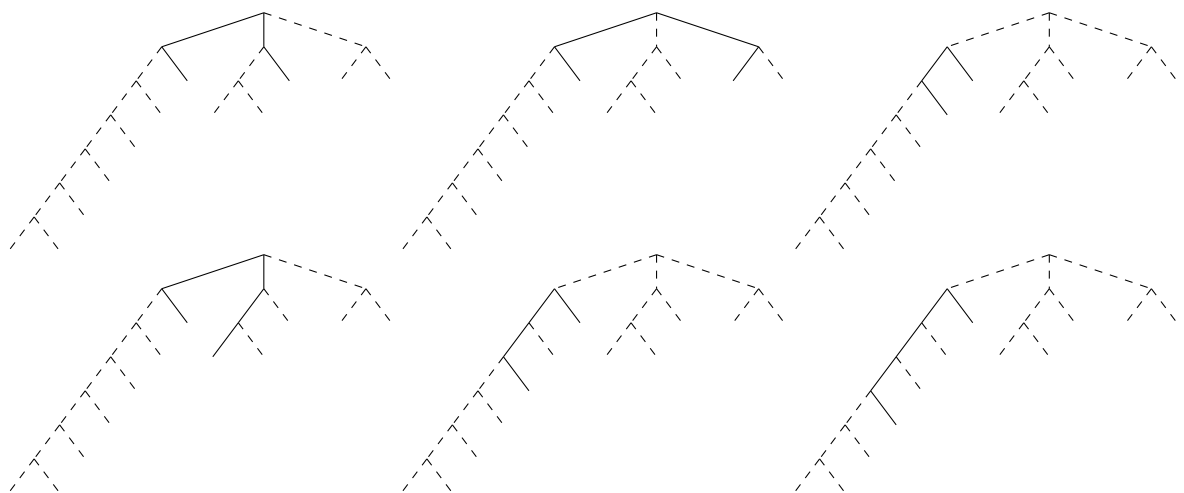


**Topology 571**

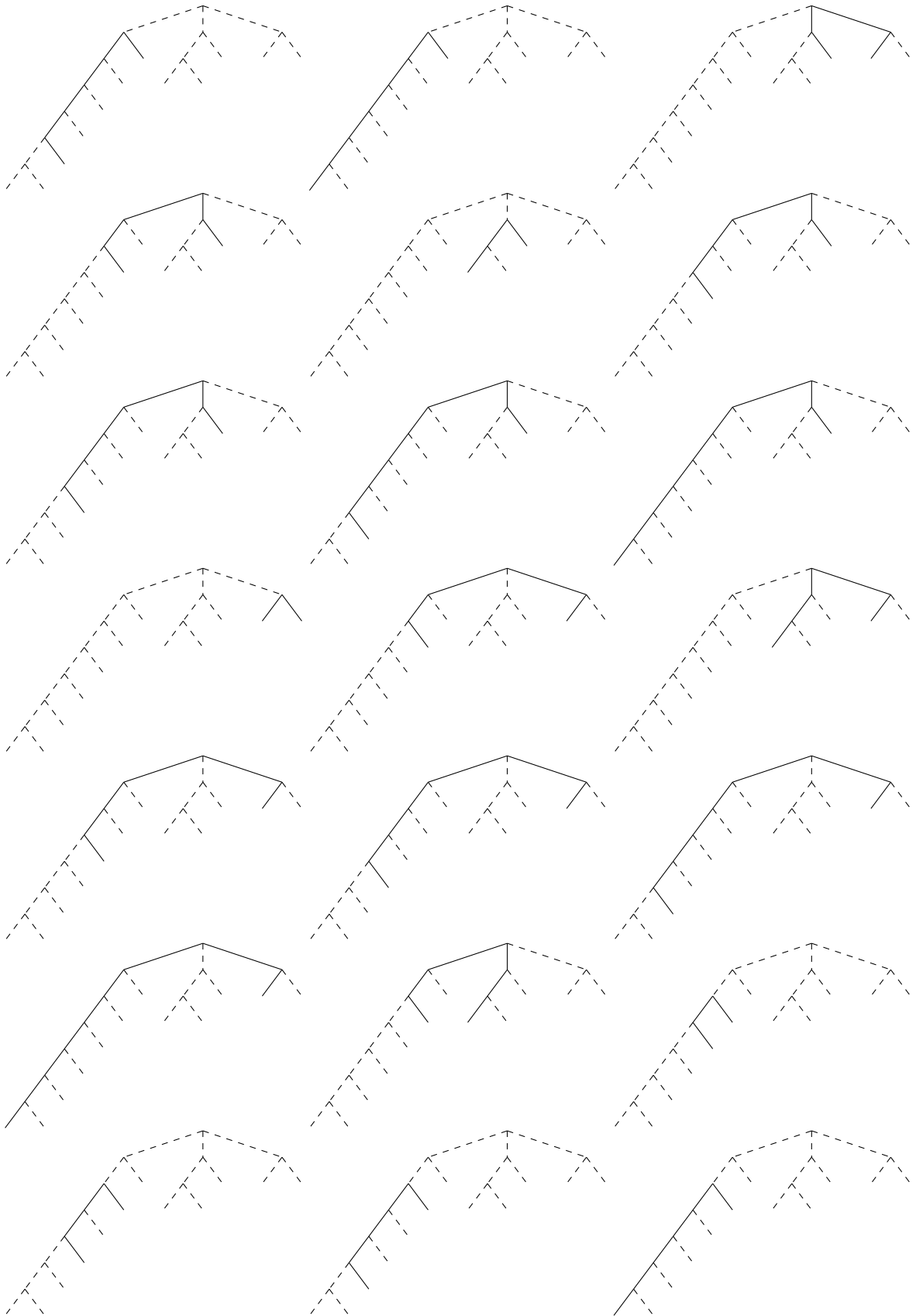
**Topology 572**

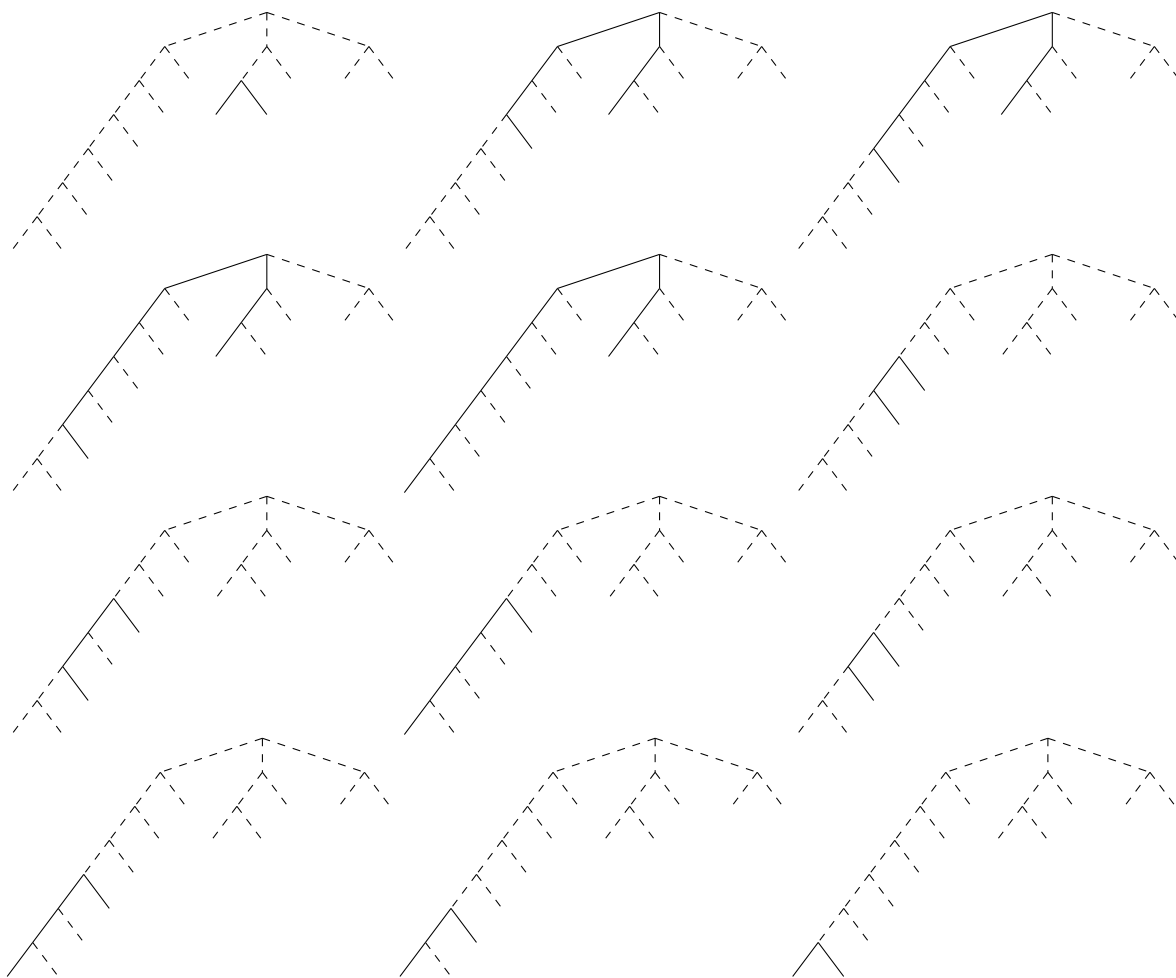
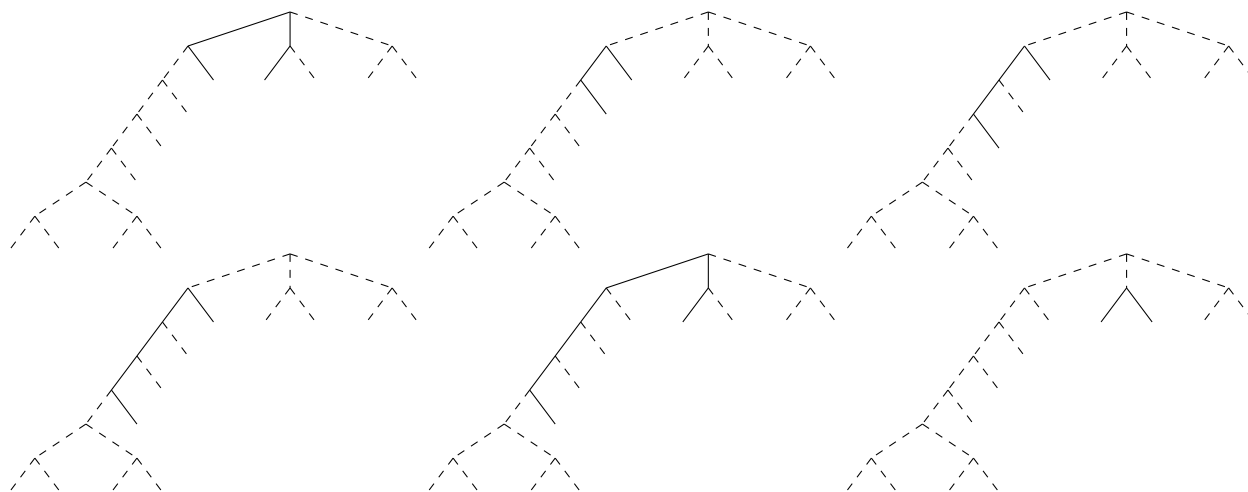


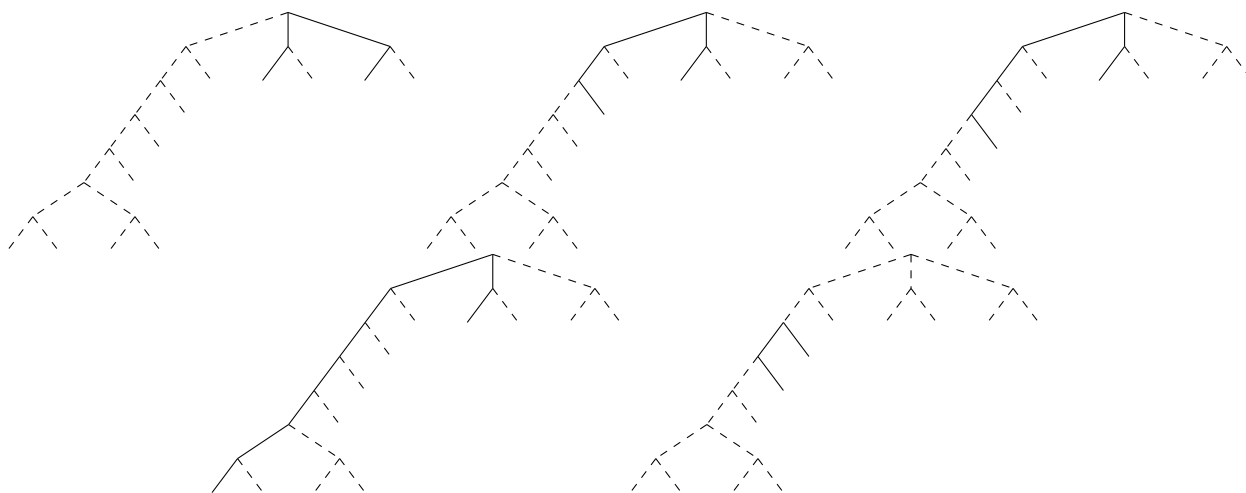
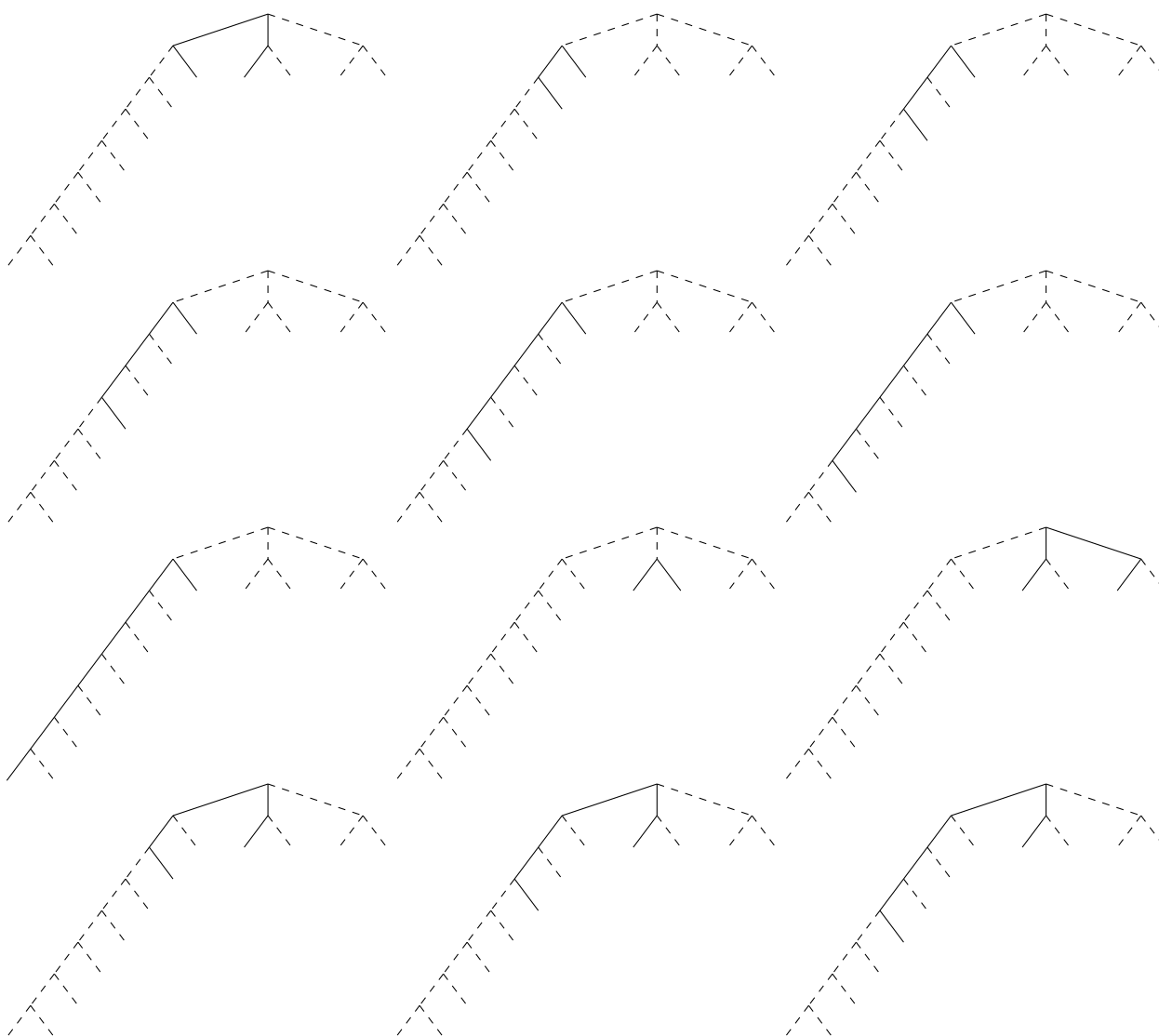
**Topology 573**

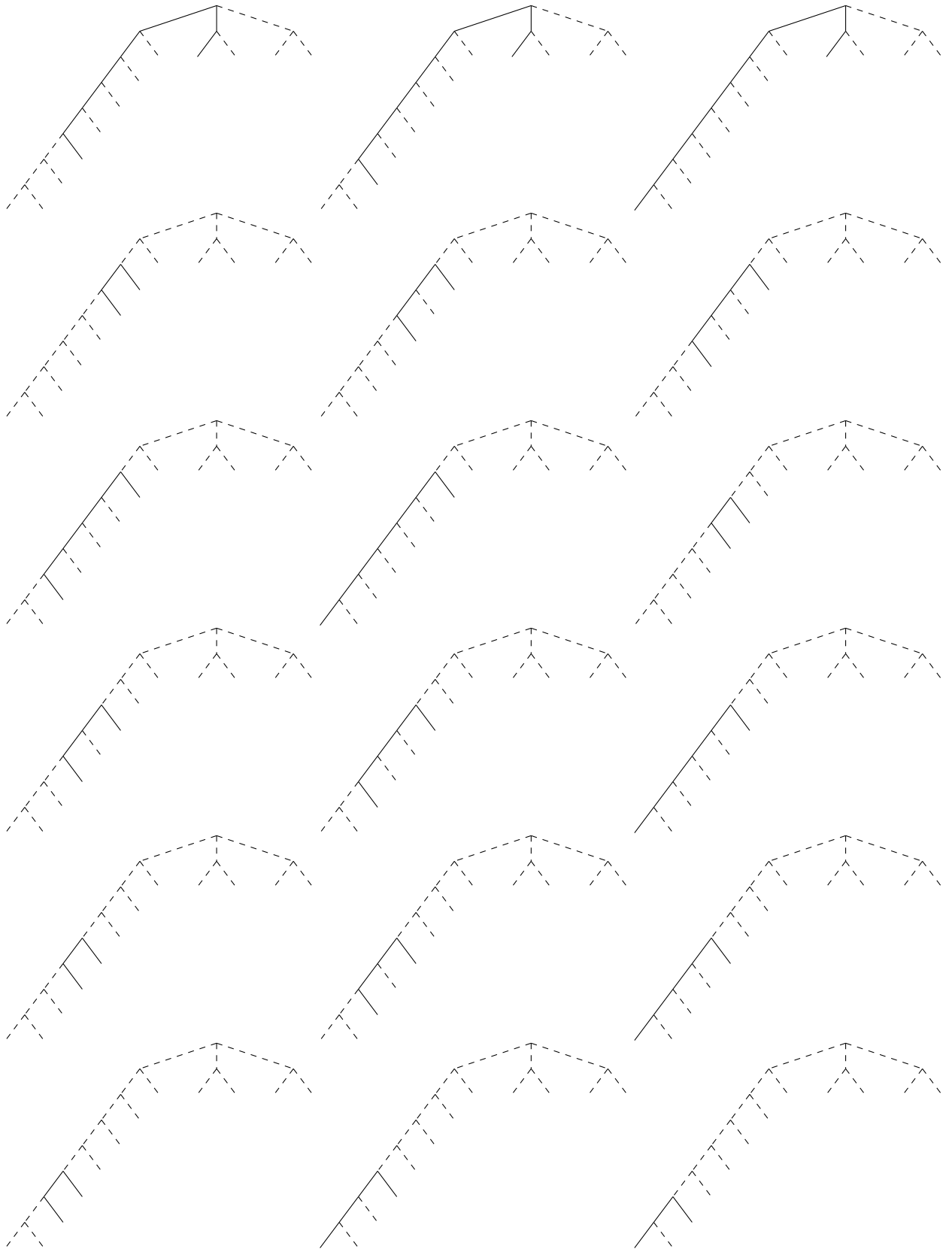


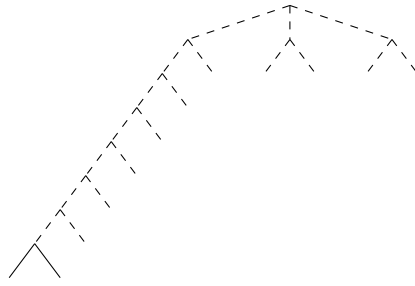




**Topology 574**

**Topology 575**



**Topology 576**