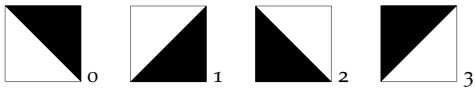
TRUCHET BOOK (I)

4X4 PATTERNS WITH ROTATIONAL SYMMETRY

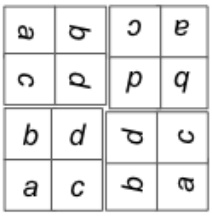
Current printing, January 2025

Introduction

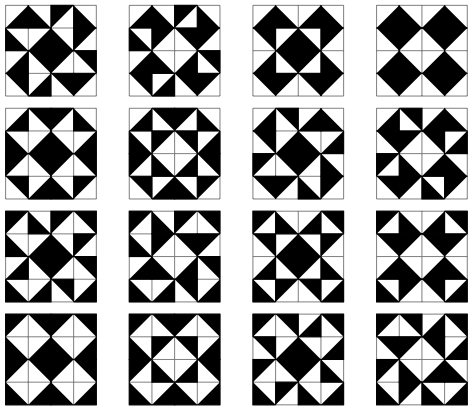
This booklet presents a complete listing of 4*x*4 Truchet tile patterns with rotational symmetry. Truchet tiles are, traditionally, square tiles that are divided by a diagonal line, and coloured with two colours, one on either side of the diagonal. Each tile can be rotated to one of four positions.



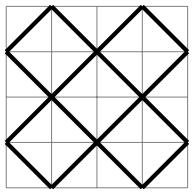
Each 4*x*4 Truchet tile pattern with rotational symmetry has a core 2*x*2 pattern in one of its quadrants that is rotated to produce the overall pattern. In this booklet, the core pattern is assumed to be in the lower left. Each pattern can identified as a sequence of 4 digits *abcd* that list the rotational positions of each tile in the lower left quadrant.



We can group these tile patterns into families where Truchet tile patterns are considered to be in the same family if they would look the same without colour – if each corresponding tile shares the same diagonal direction. The sequence that represents the family of a tile pattern can be found by taking the sequence of the tile pattern *modulo* 2. So, for example, the 16 tile patterns below are all members of the 0110 family.

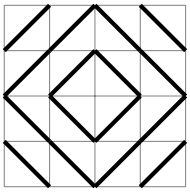


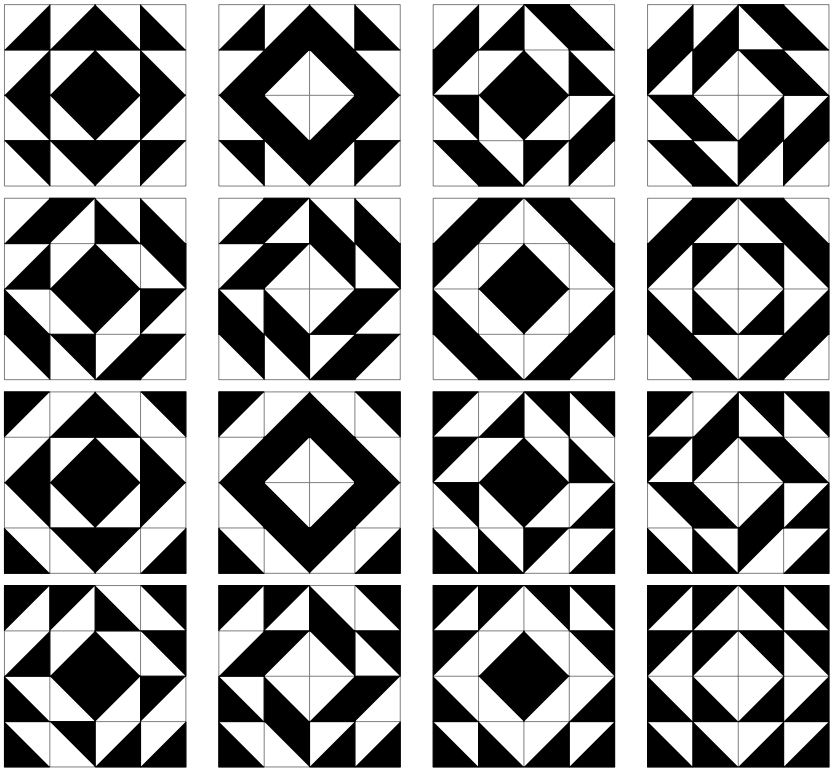
The 0110 pattern family



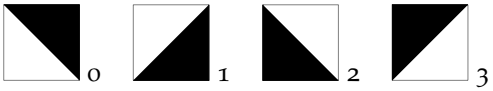
The 0110 family pattern

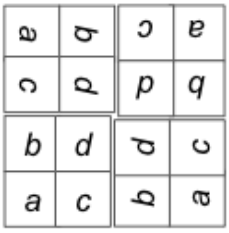
0000



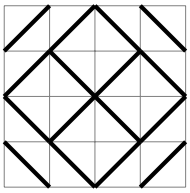


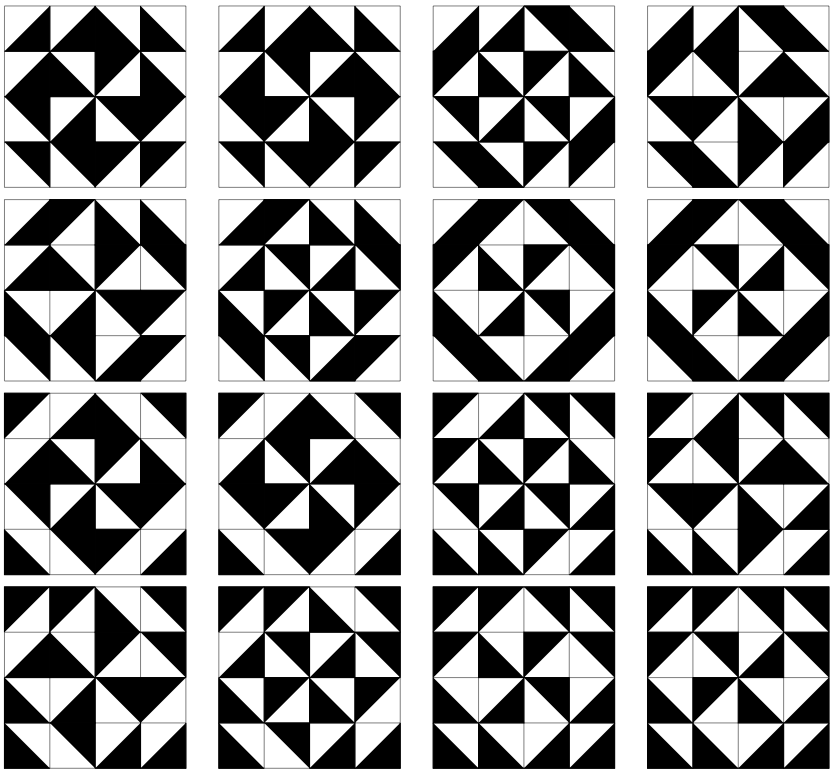
0000 0002 0020 0022
0200 0202 0220 0222
2000 2002 2020 2022
2200 2202 2220 2222





0001





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0201 0203 0221 0223
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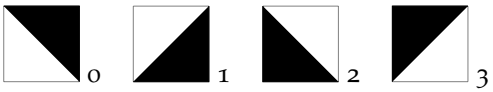
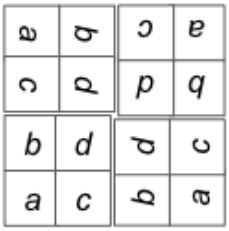
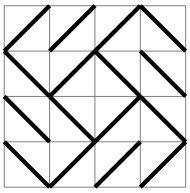
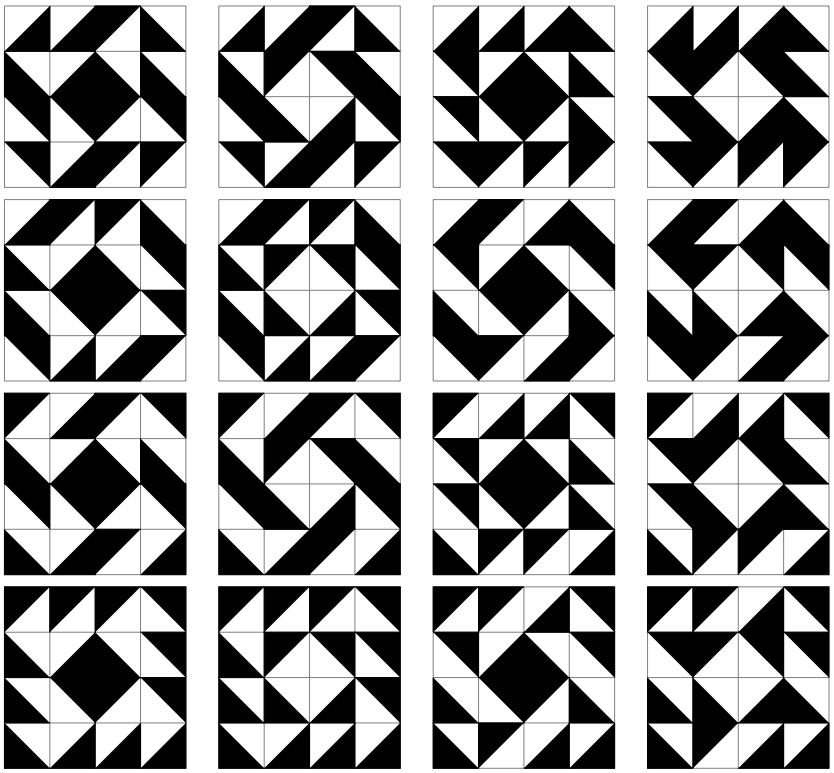
2201 2203 2221 2223





0010





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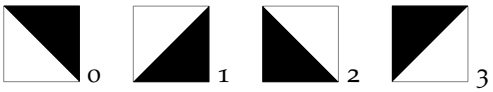
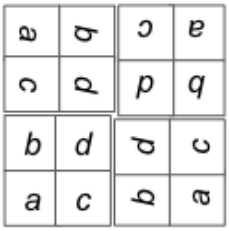
0210 0212 0230 0232
2010 2012 2030 2032
2210 2212 2230 2232





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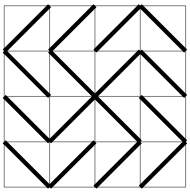

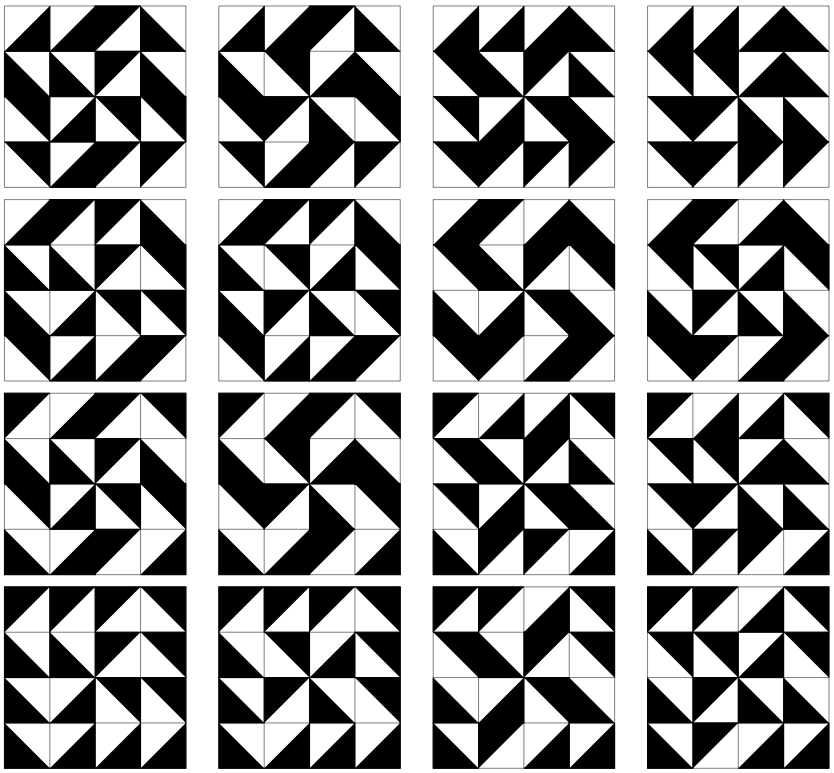

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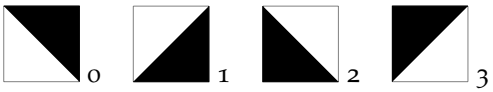

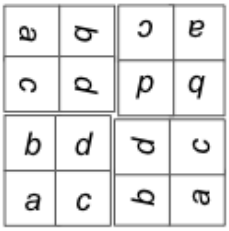

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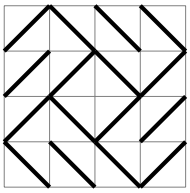

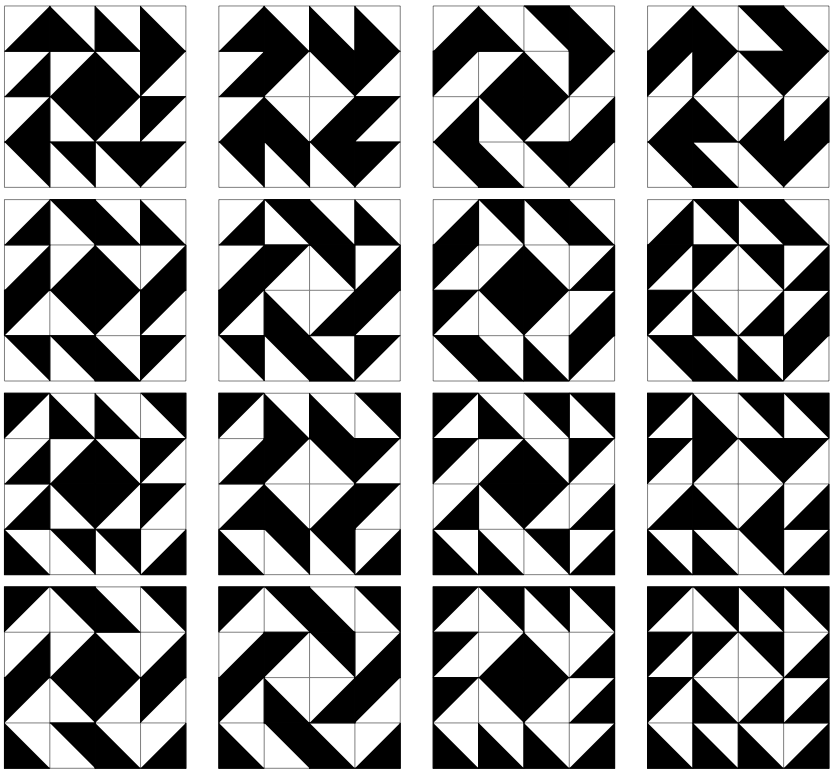

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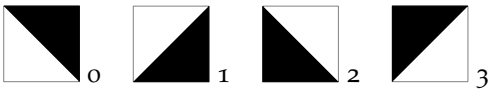

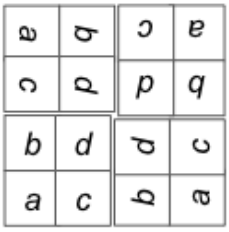

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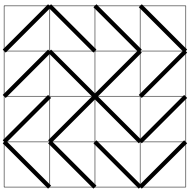

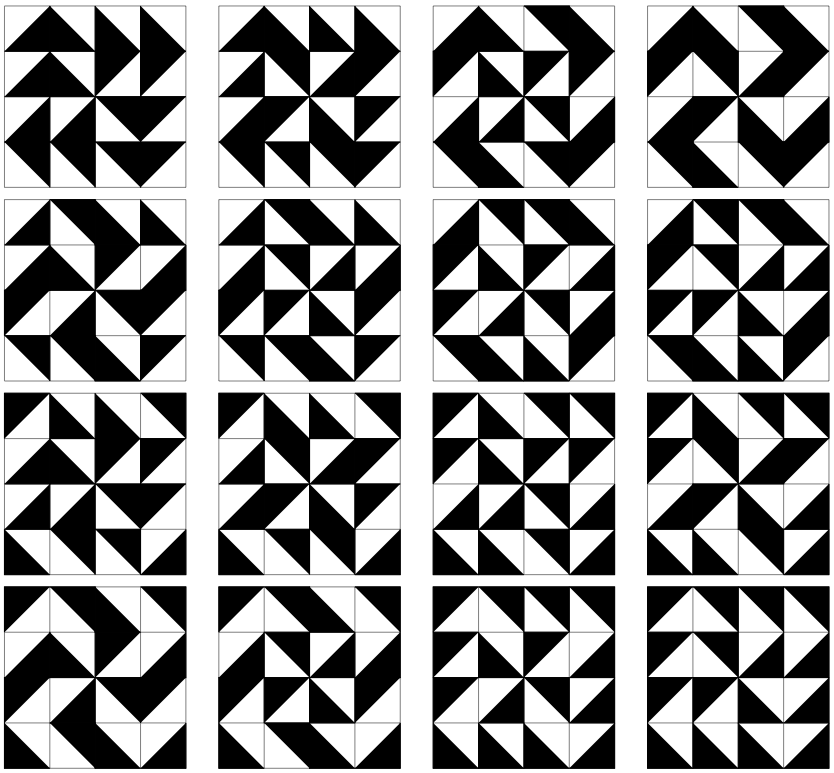

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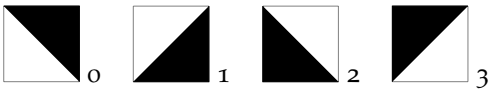

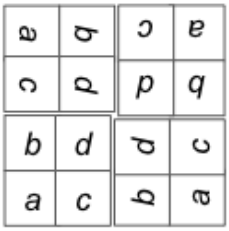

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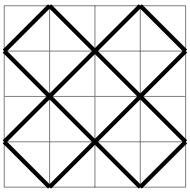

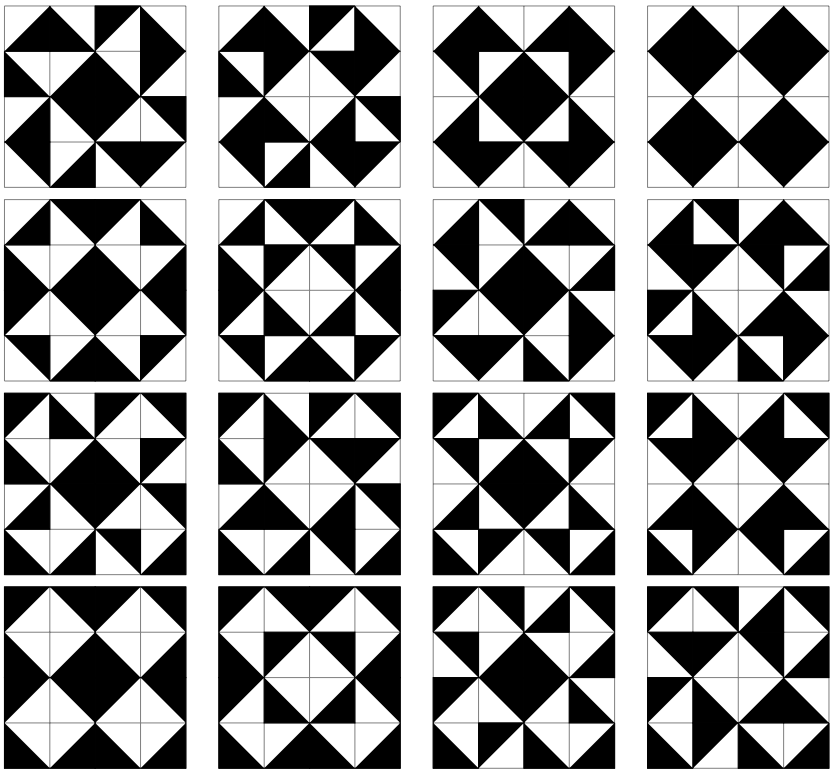

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2110 2112 2130 2132
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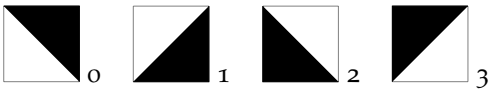

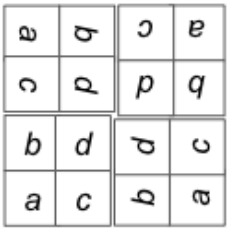

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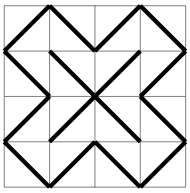

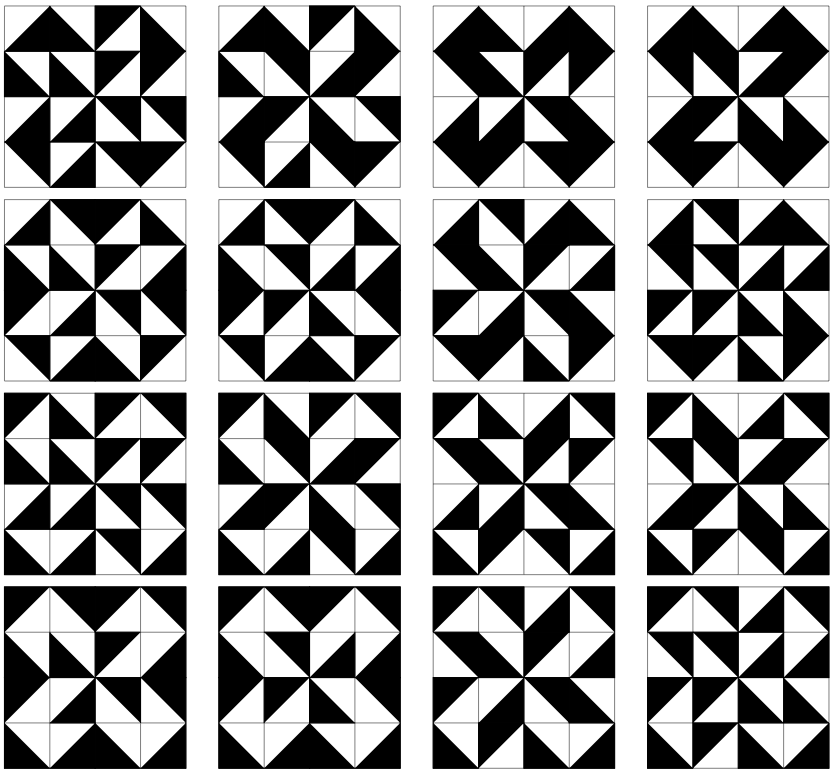

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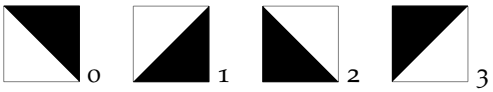

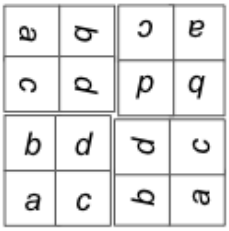

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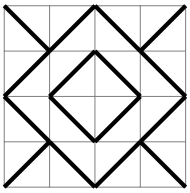

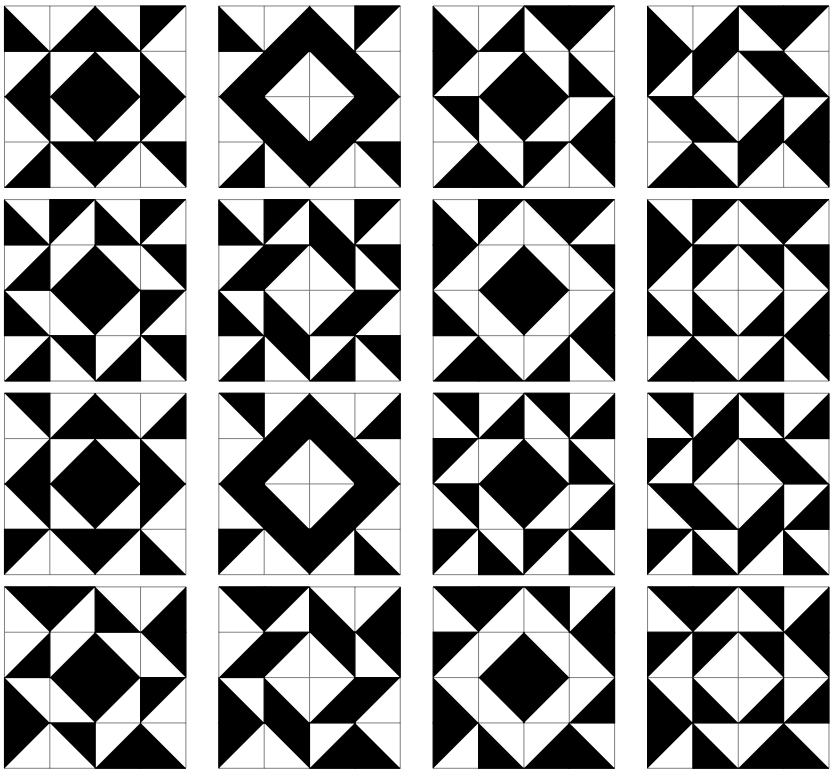

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1200 1202 1220 1222
3000 3002 3020 3022
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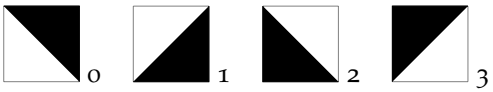

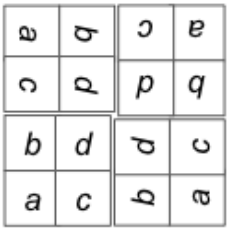

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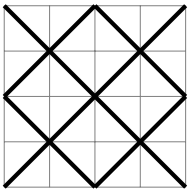

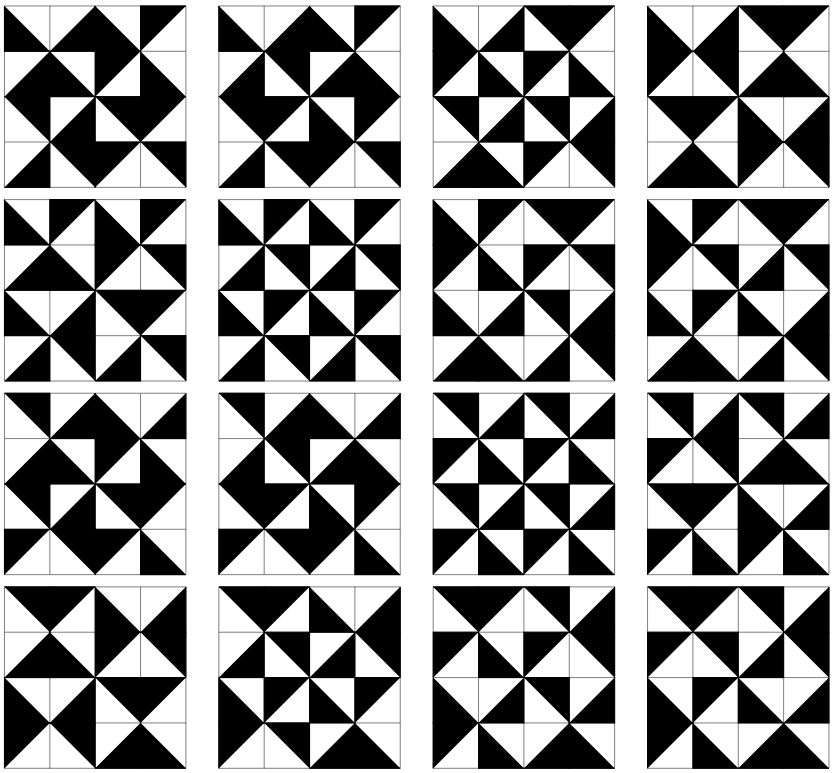

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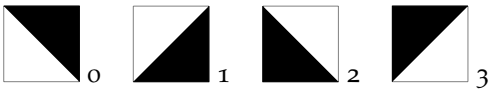
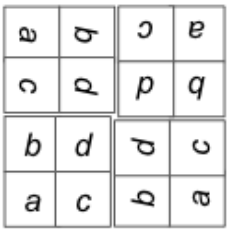
3201 3203 3221 3223





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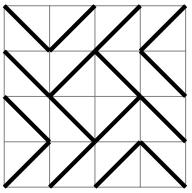

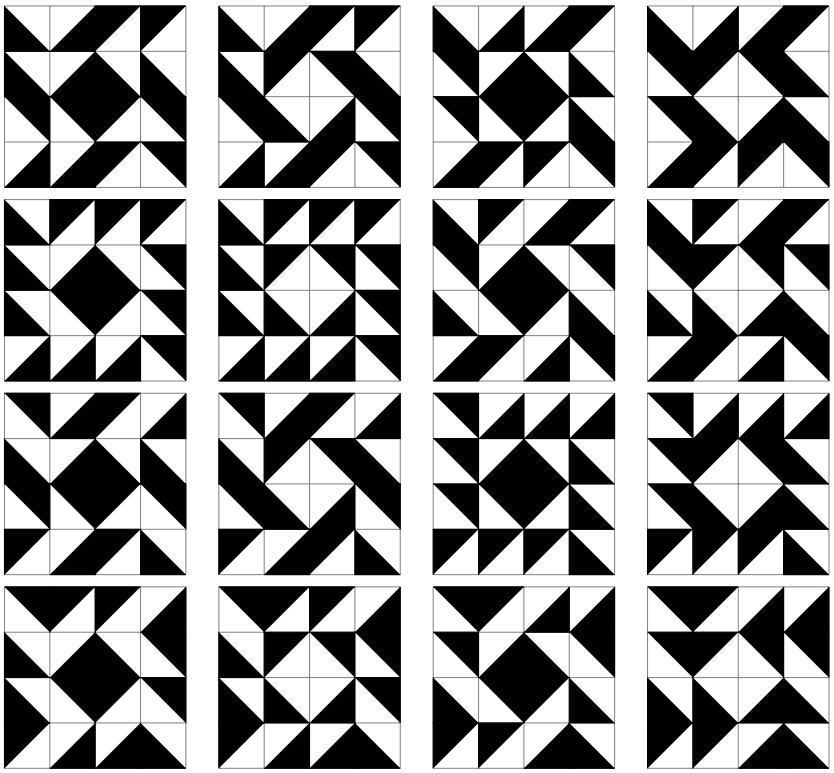

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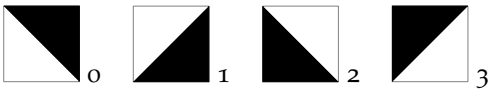

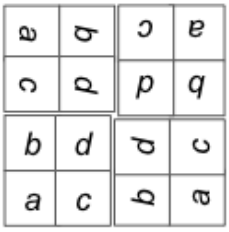

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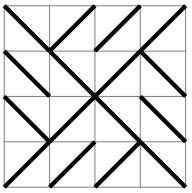

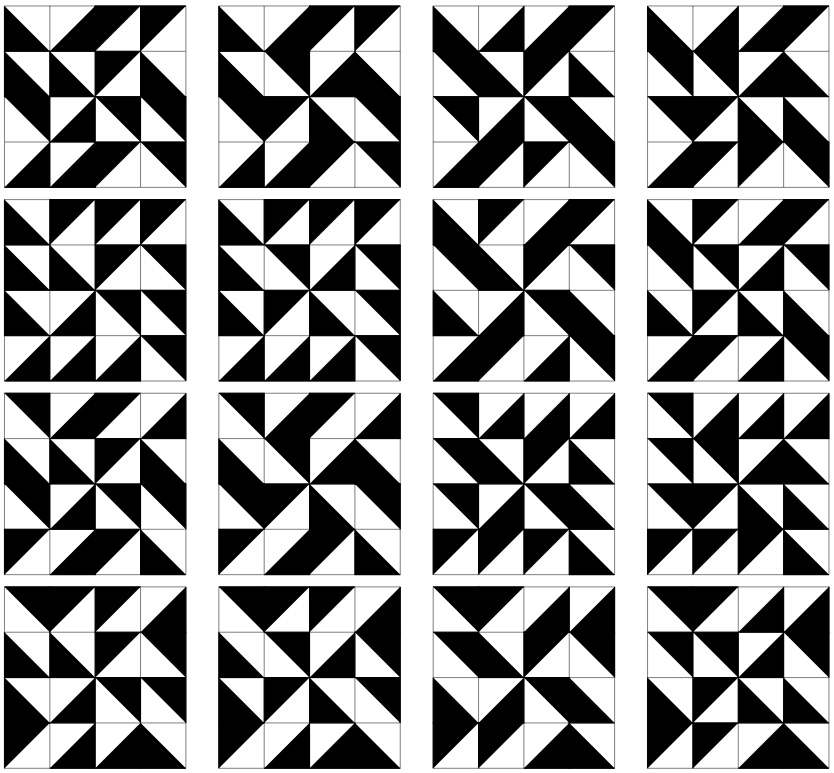

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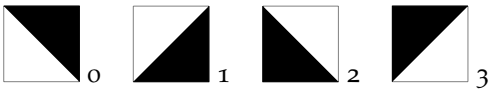

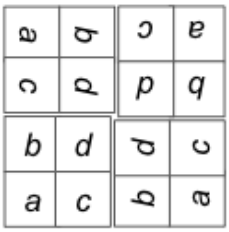

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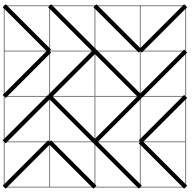

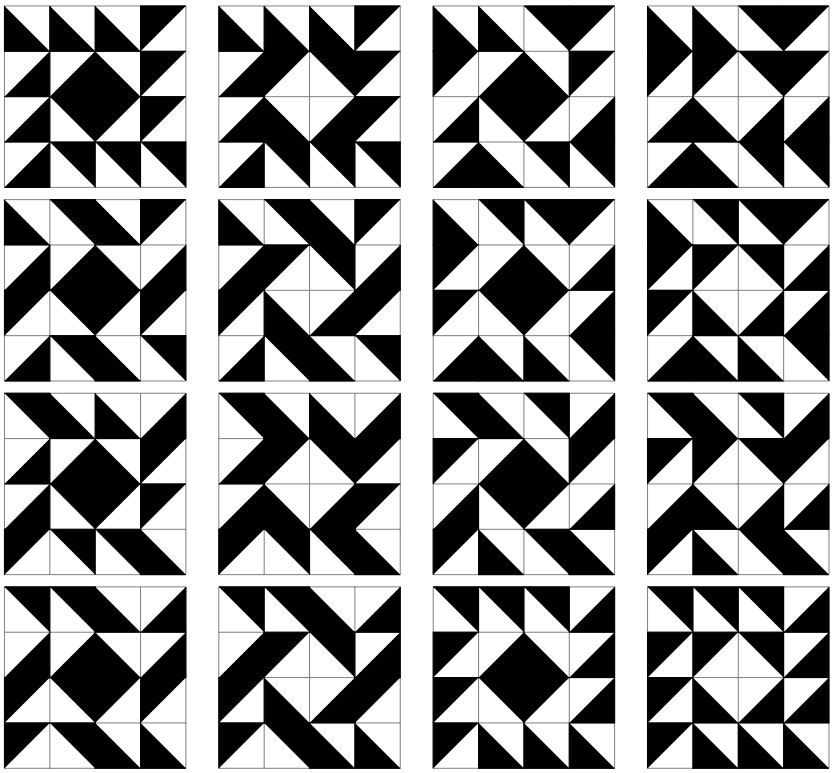

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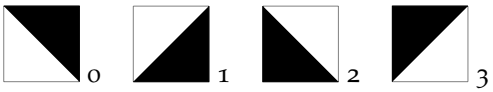
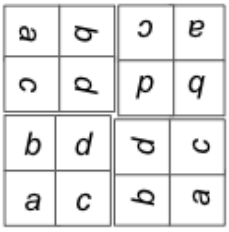
3100 3102 3120 3122
3300 3302 3320 3322





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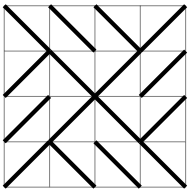

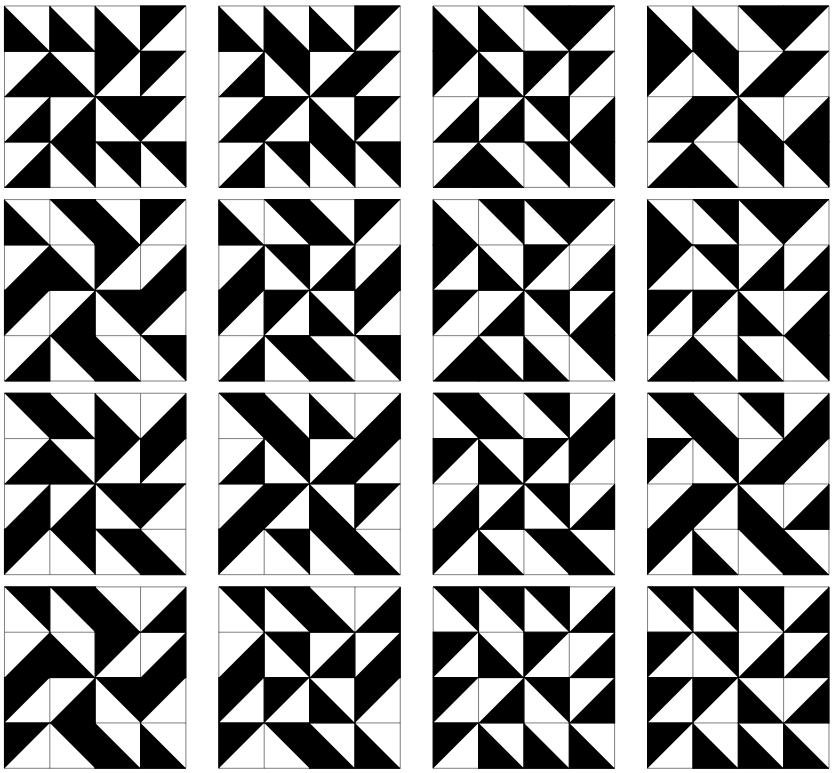

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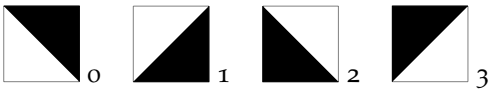

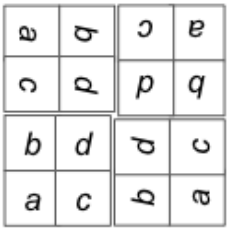

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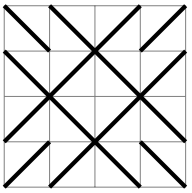

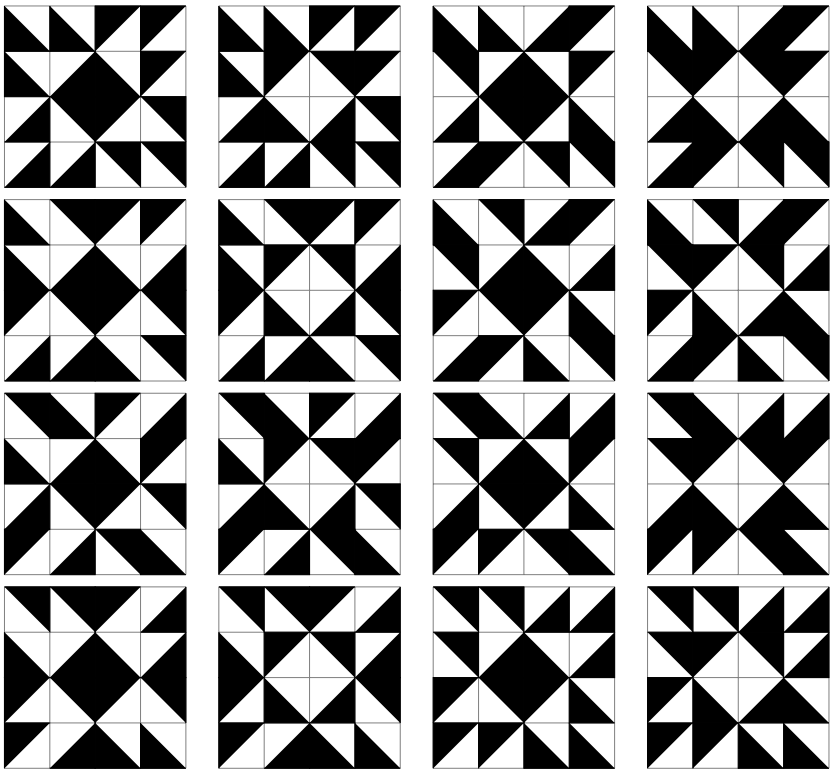

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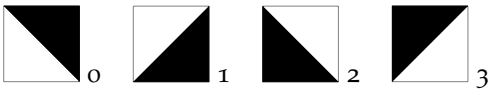

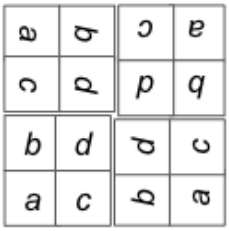

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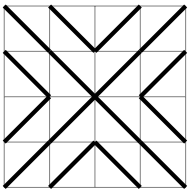

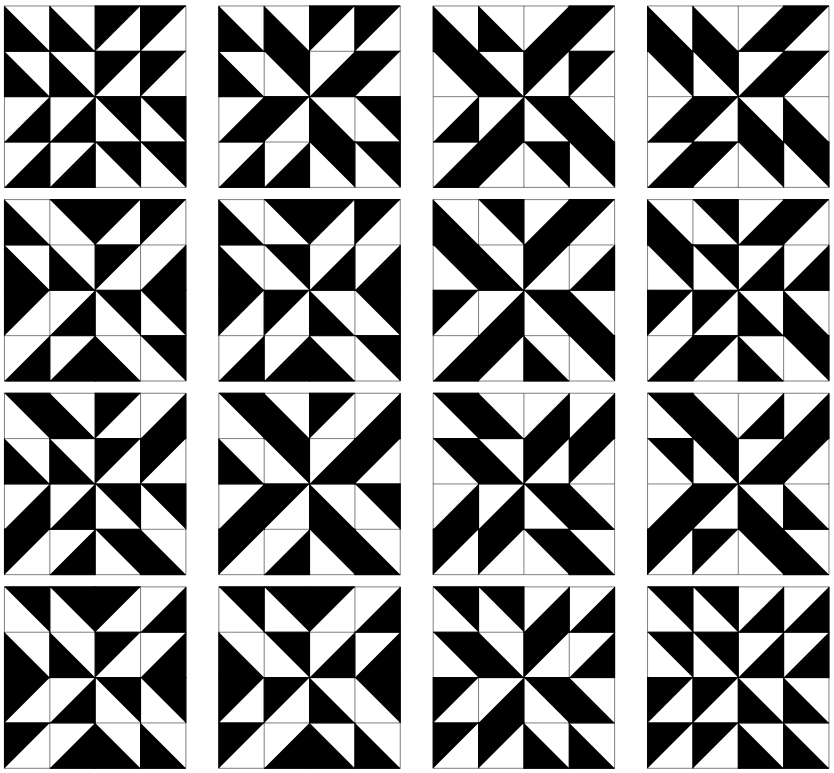

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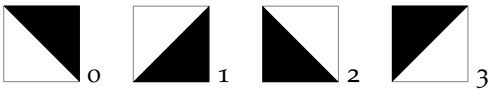

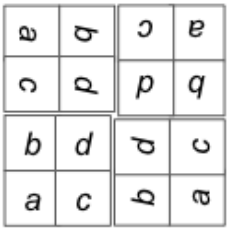

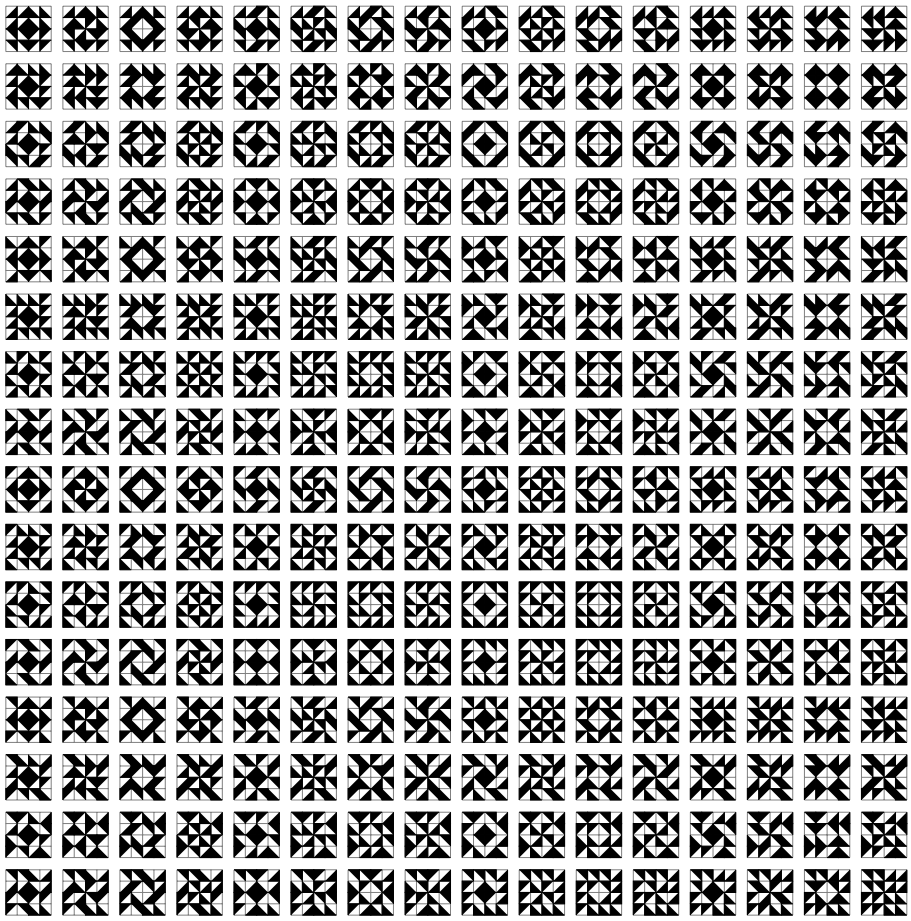

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