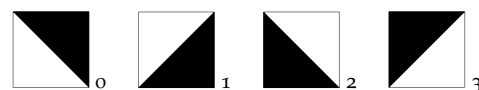


TRUCHET BOOK (I)

4X4 PATTERNS WITH ROTATIONAL
SYMMETRY

Introduction

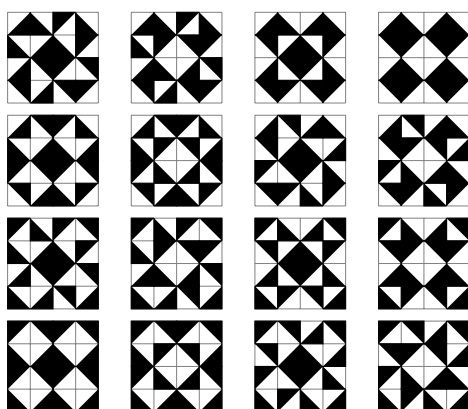
This booklet presents a complete listing of 4x4 Truchet tile patterns with rotational symmetry. Truchet tiles are, traditionally, square tiles that are divided by a diagonal line, and coloured with two colours, one on either side of the diagonal. Each tile can be rotated to one of four positions.



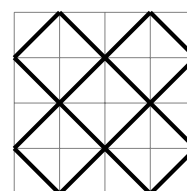
Each 4x4 Truchet tile pattern with rotational symmetry has a core 2x2 pattern in one of its quadrants that is rotated to produce the overall pattern. In this booklet, the core pattern is assumed to be in the lower left. Each pattern can be identified as a sequence of 4 digits $abcd$ that list the rotational positions of each tile in the lower left quadrant.

a	d	c	e
c	p	p	q
b	d	d	c
a	c	b	a

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.

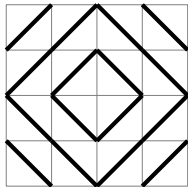
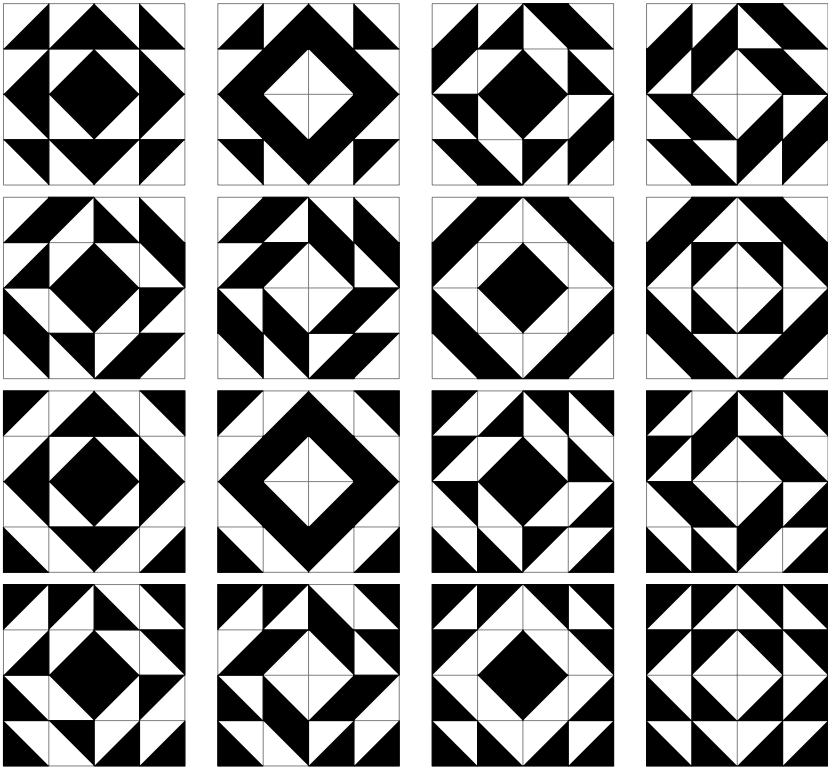


The 0110 pattern family

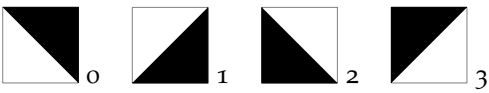


The 0110 family pattern

0000

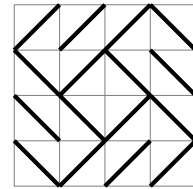
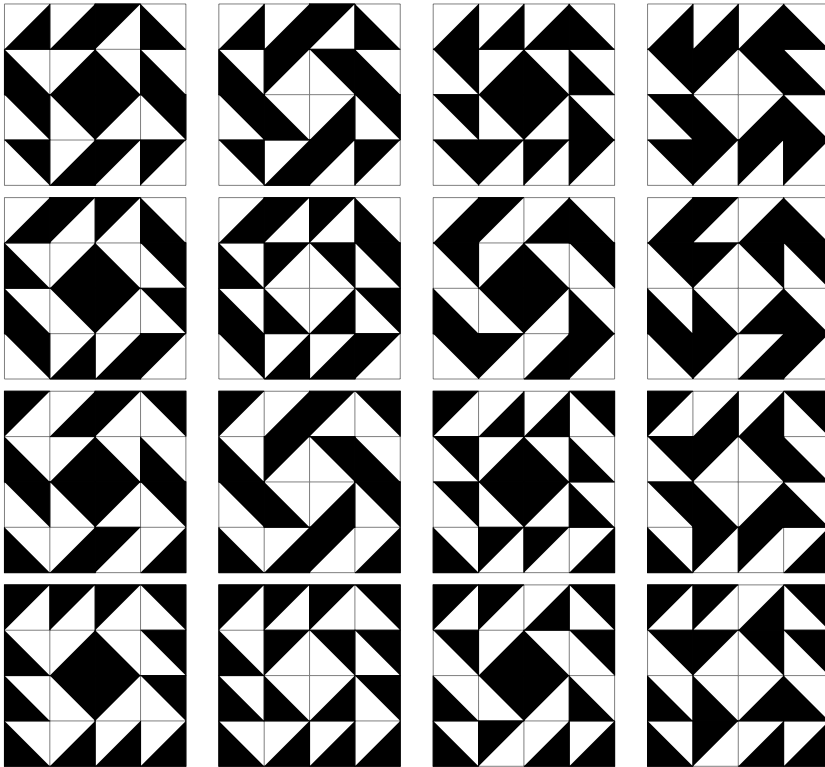


0000 0002 0020 0022
0200 0202 0220 0222
2000 2002 2020 2022
2200 2202 2220 2222

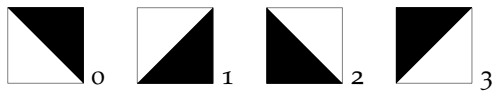


a	q	c	a
c	p	p	q
b	d	d	c
a	c	b	a

0010

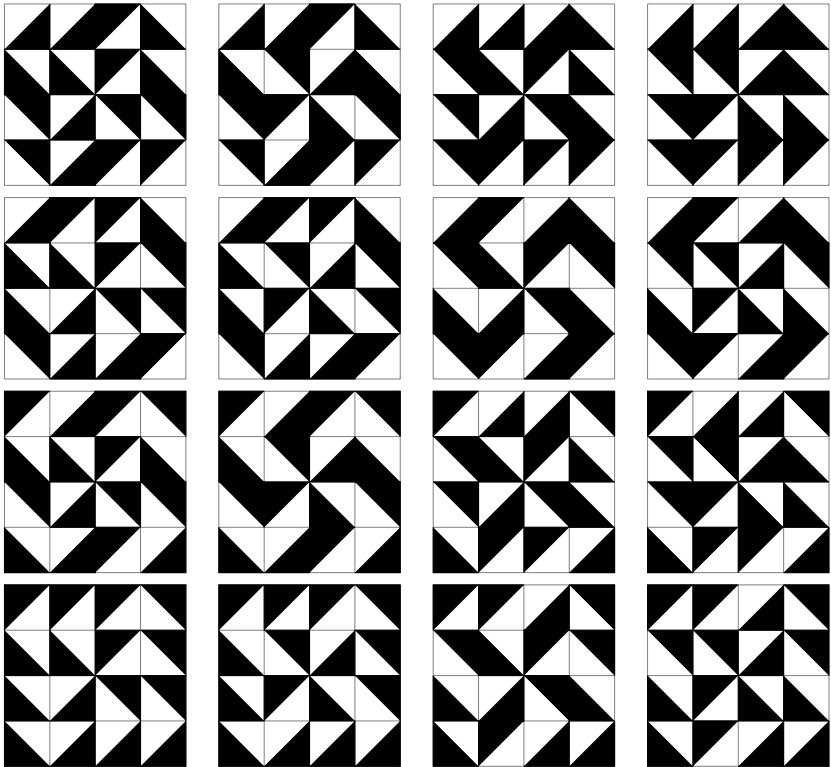
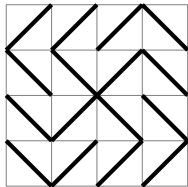


0010 0012 0030 0032
 0210 0212 0230 0232
 2010 2012 2030 2032
 2210 2212 2230 2232

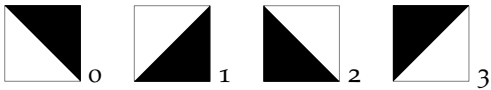


a	q	c	e
c	p	p	q
b	d	d	c
a	c	b	a

0011

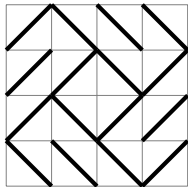
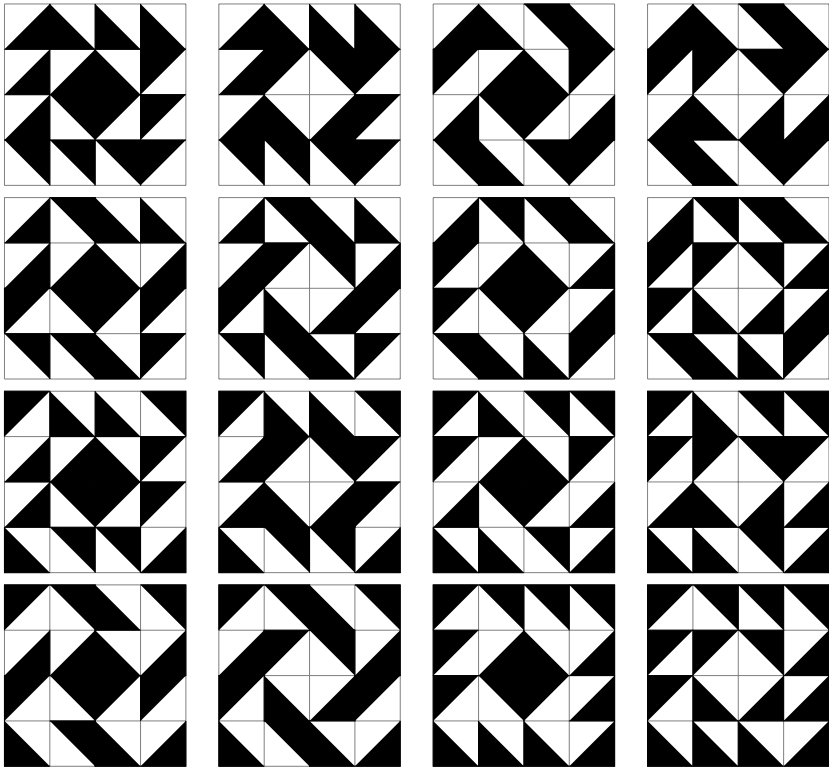


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0211 0213 0231 0233
2011 2013 2031 2033
2211 2213 2231 2233

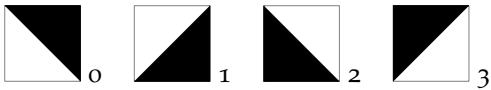


a	q	c	e
c	p	p	q
b	d	d	c
a	c	b	a

0100

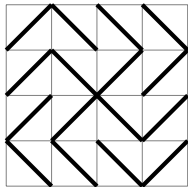
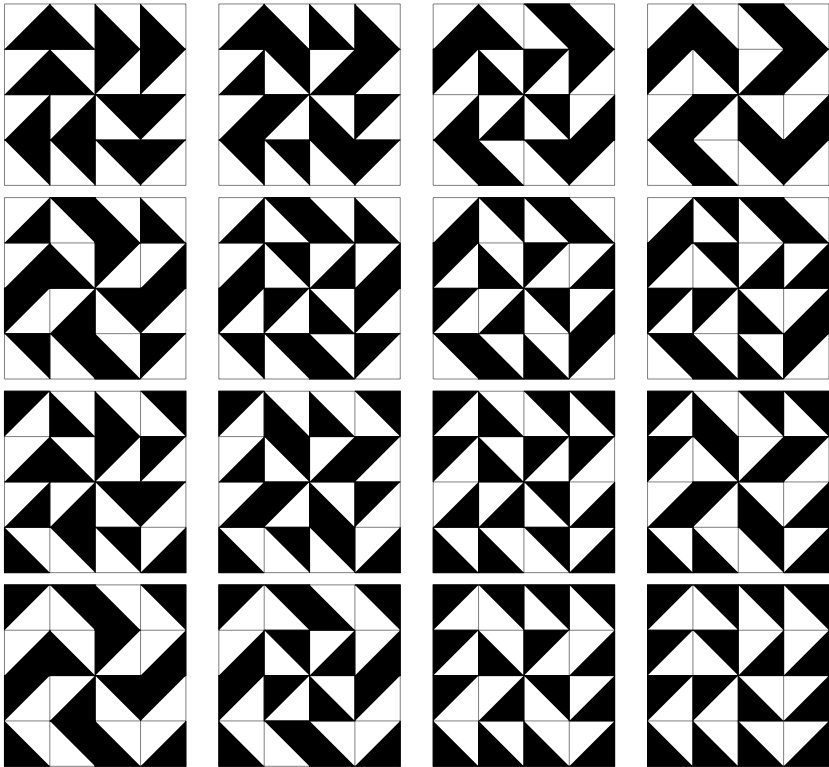


0100 0102 0120 0122
0300 0302 0320 0322
2100 2102 2120 2122
2300 2302 2320 2322

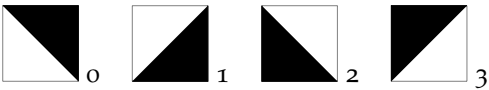


a	q	c	e
c	p	p	q
b	d	d	c
a	c	b	a

0101

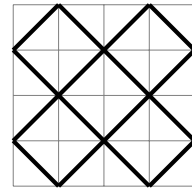
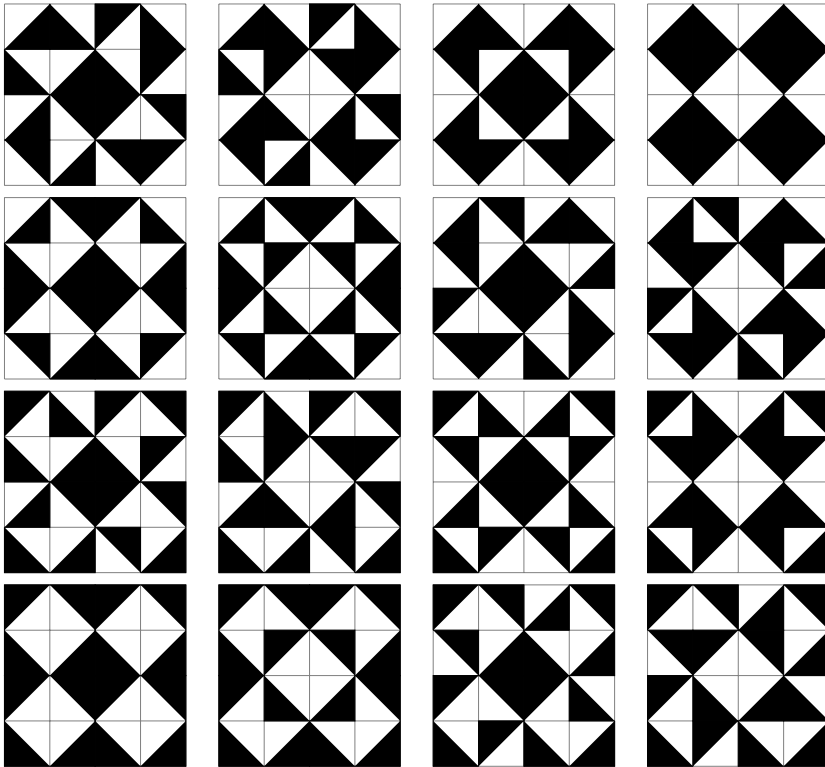


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0301 0303 0321 0323
2101 2103 2121 2123
2301 2303 2321 2323

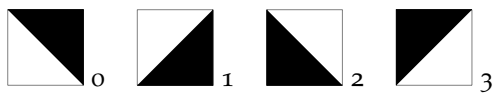


a	q	c	e
c	p	p	q
b	d	d	c
a	c	b	a

0110

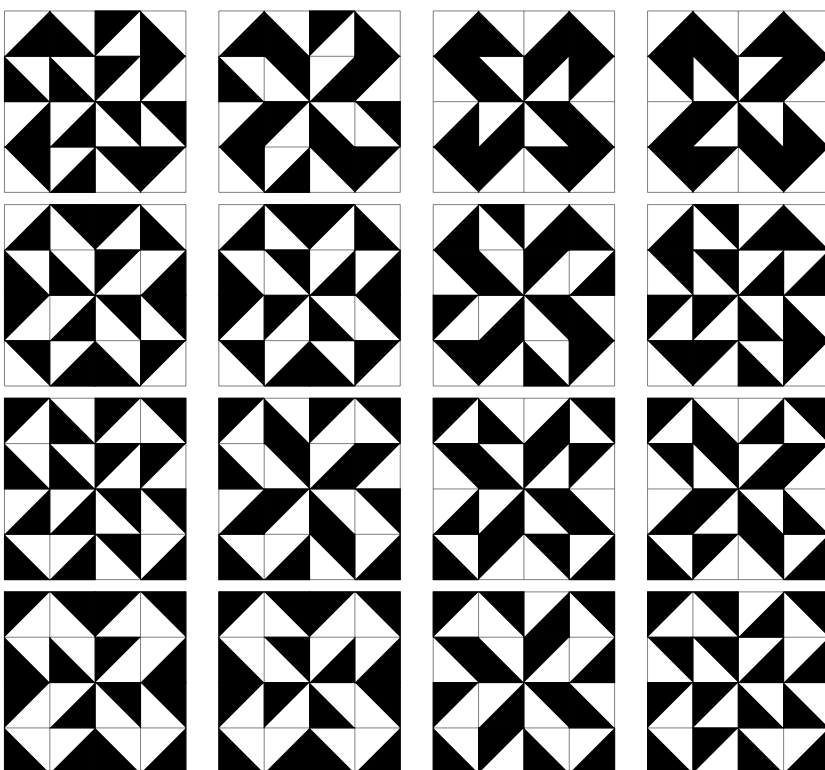
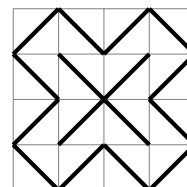


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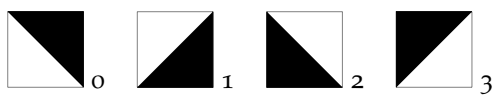


a	q	c	e
c	p	p	q
b	d	d	c
a	c	b	a

0111

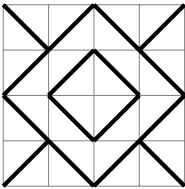
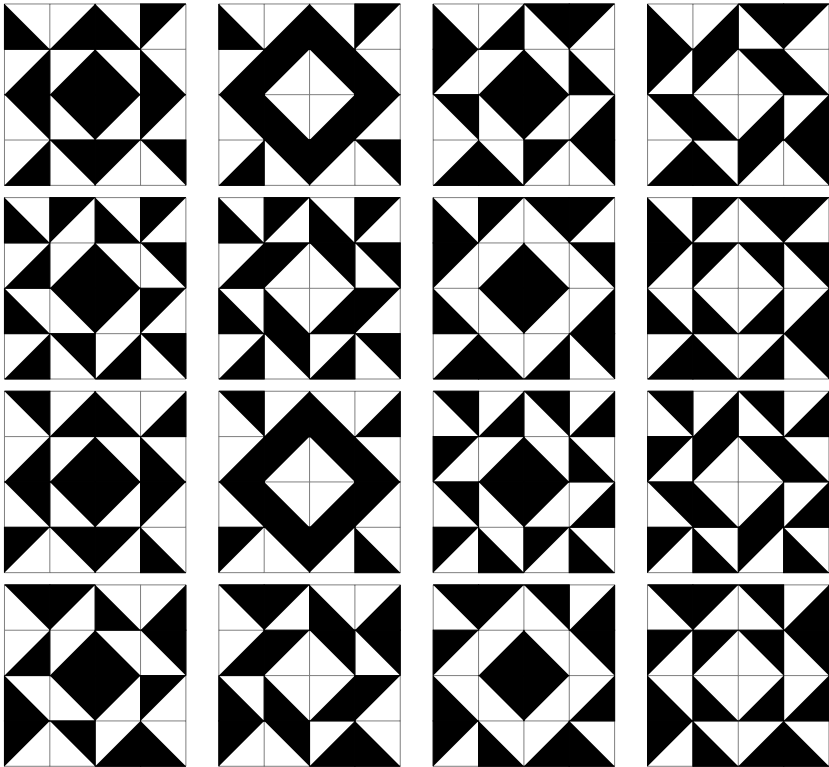


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 0311 0313 0331 0333
 2111 2113 2131 2133
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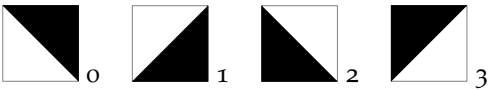


a	q	c	e
c	p	p	q
b	d	d	c
a	c	b	a

1000

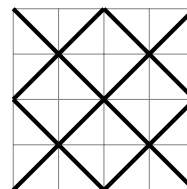
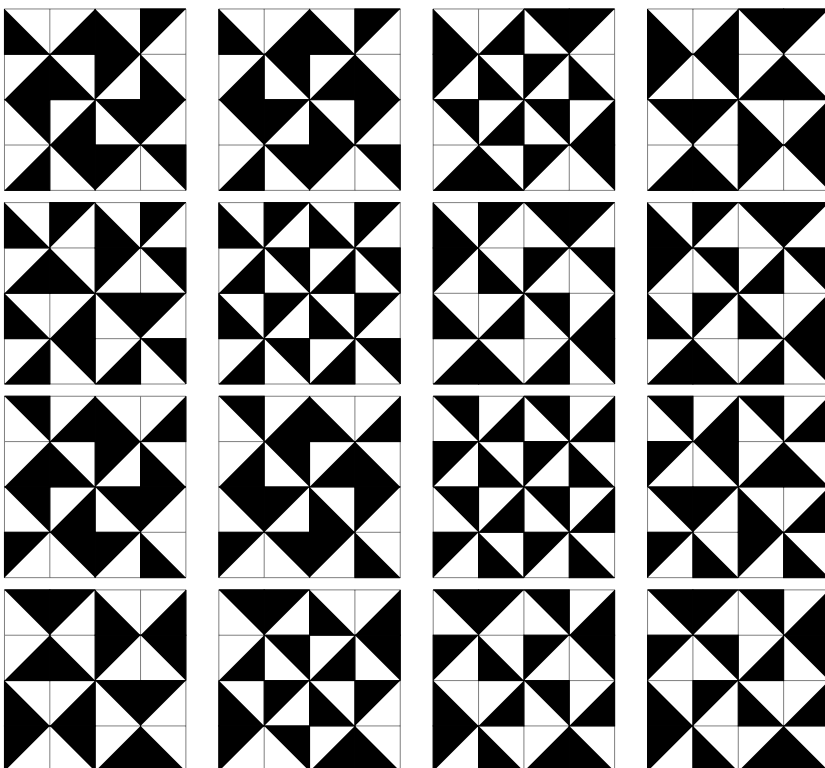


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3000 3002 3020 3022
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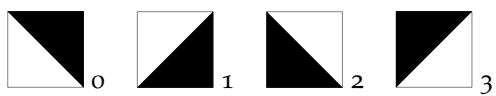


a	q	c	e
c	p	p	q
b	d	d	c
a	c	b	a

1001

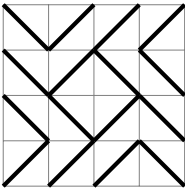
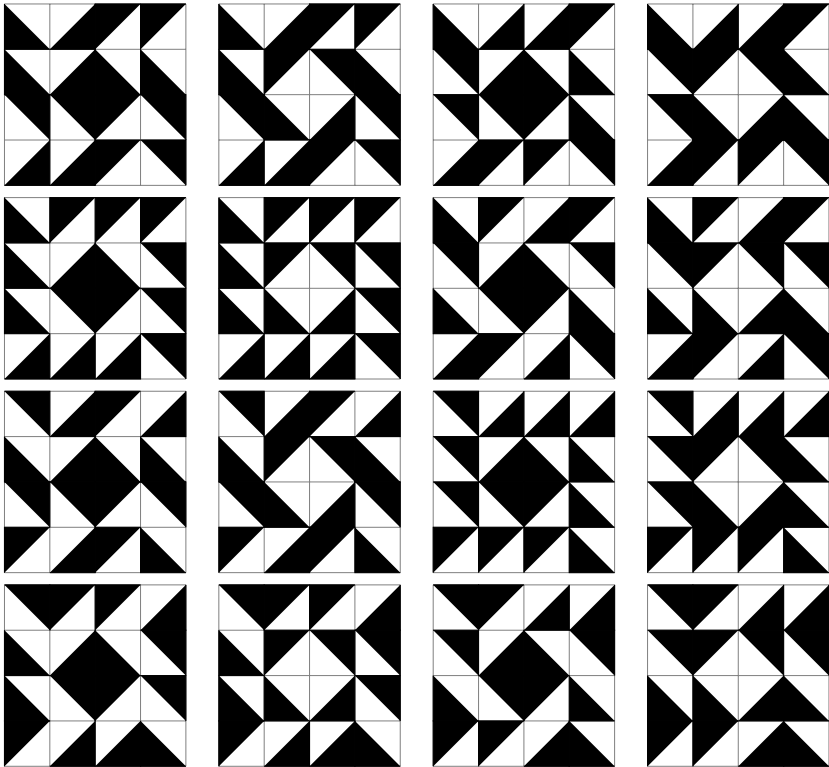


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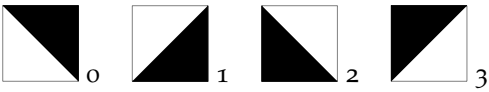


a	q	c	e
c	p	p	q
b	d	d	c
a	c	b	a

1010

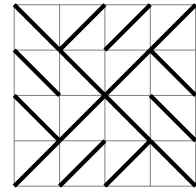
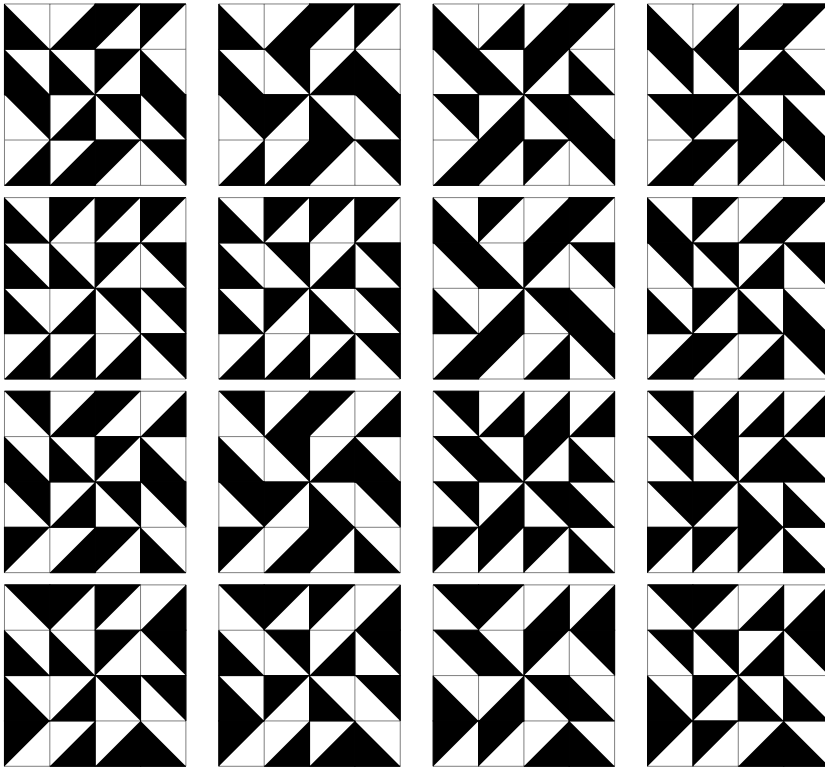


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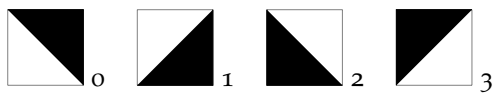


a	q	c	e
c	p	p	q
b	d	d	c
a	c	b	a

1011

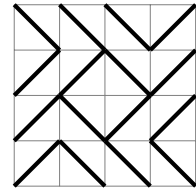
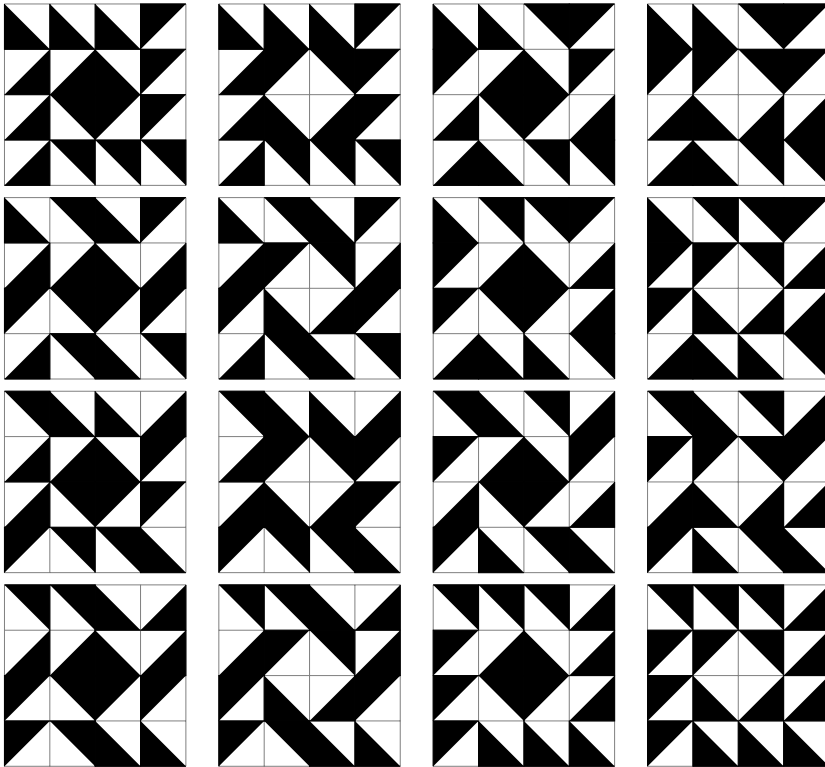


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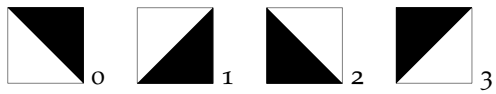


a	q	c	e
c	p	p	q
b	d	d	c
a	c	b	a

1100

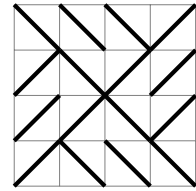
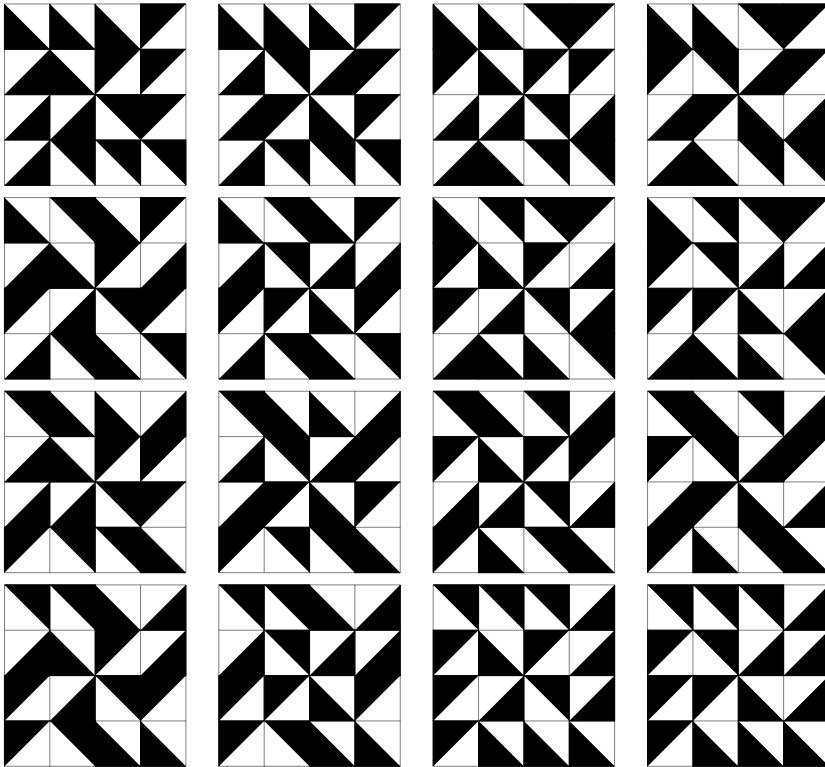


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 3300 3302 3320 3322

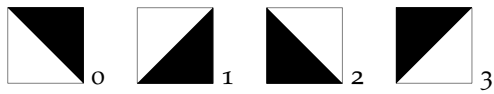


a	q	c	e
c	p	p	q
b	d	d	c
a	c	b	a

1101

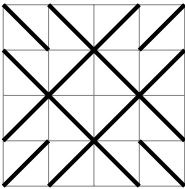
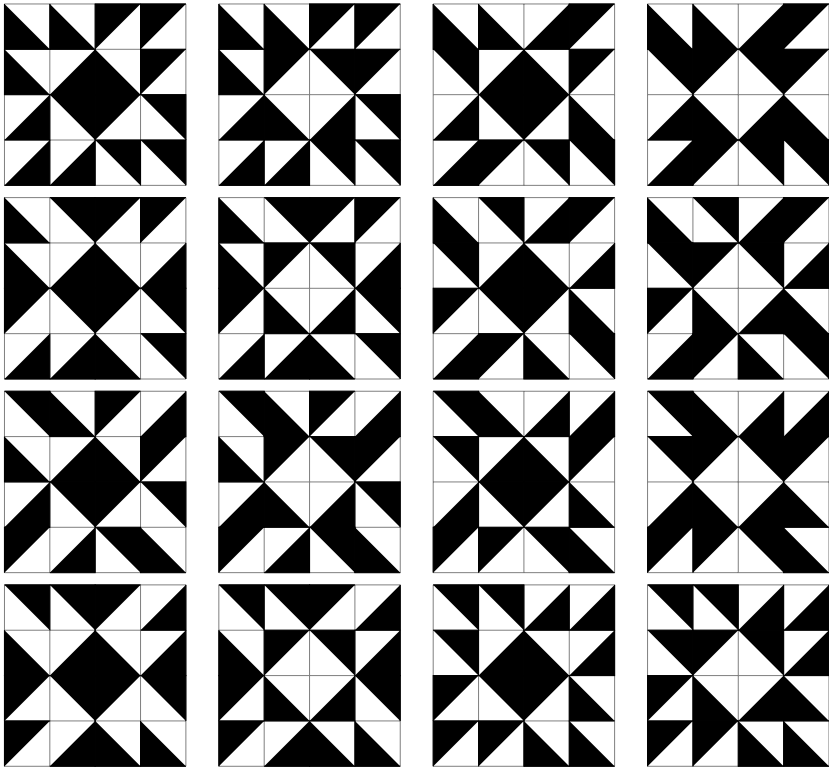


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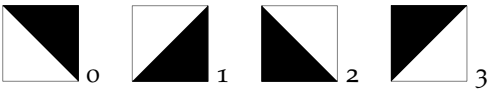


a	q	c	e
c	p	p	q
b	d	d	c
a	c	b	a

1110

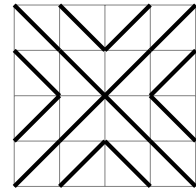
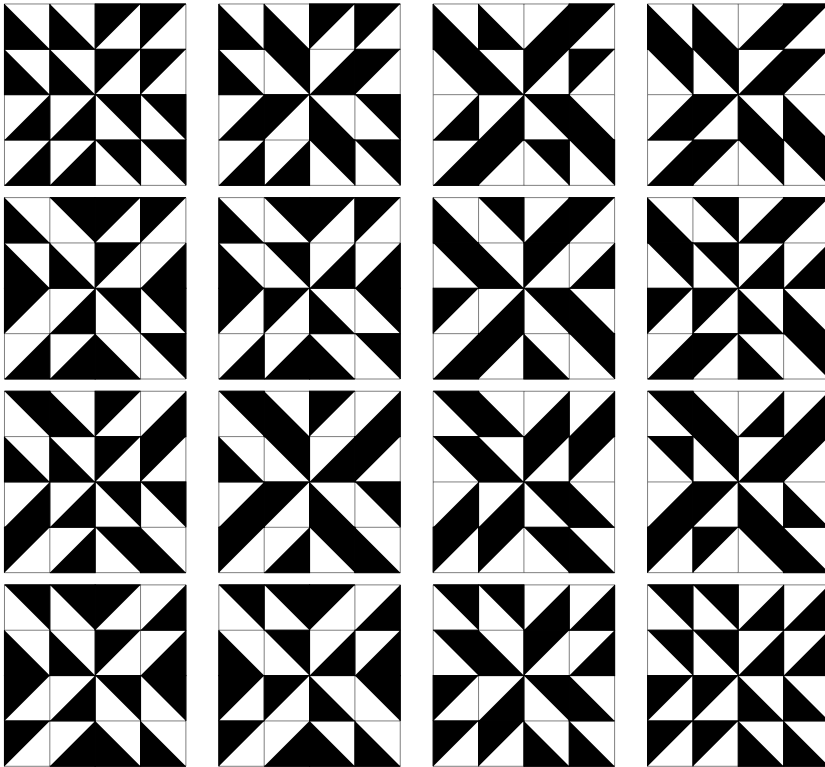


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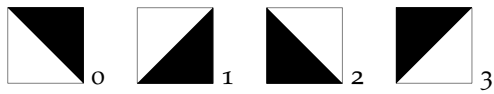


a	q	c	e
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b	d	d	c
a	c	b	a

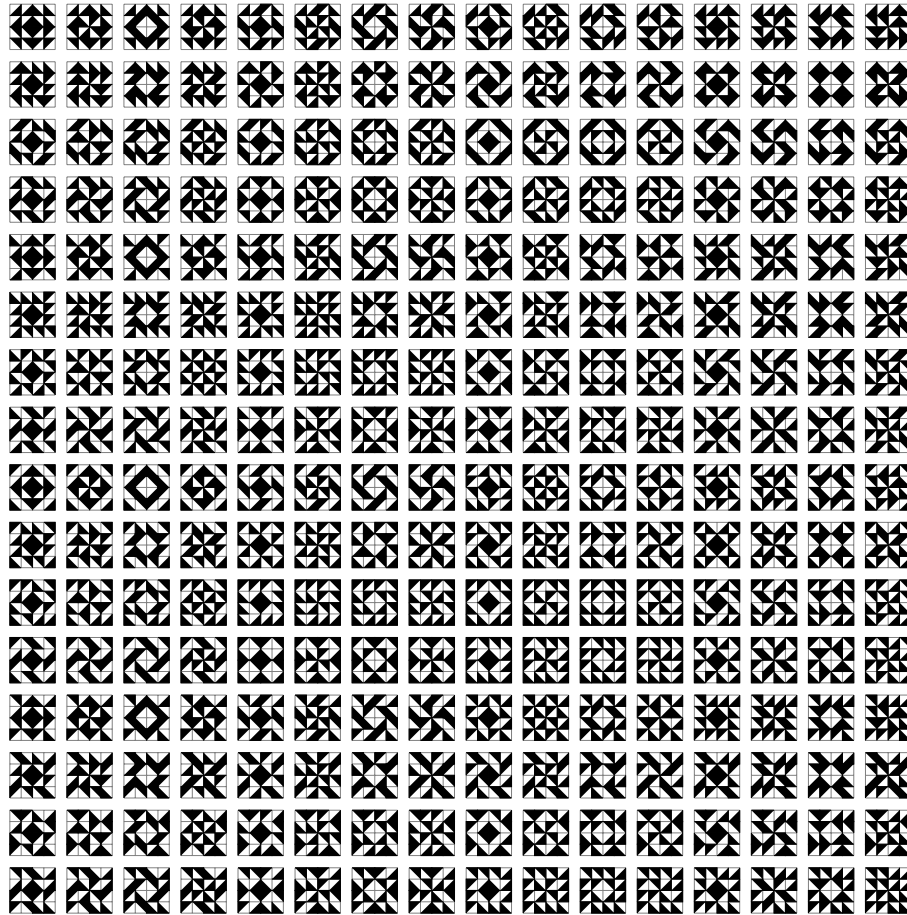
1111



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 3311 3313 3331 3333



a	q	c	e
c	p	p	q
b	d	d	c
a	c	b	a



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