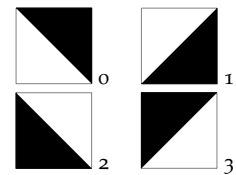


TRUCHET BOOK (I)

4X4 PATTERNS WITH ROTATIONAL
SYMMETRY

Introduction

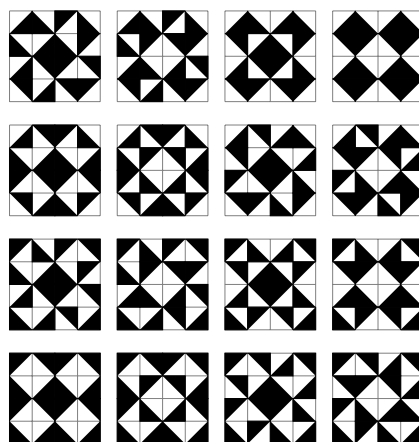
This booklet presents a complete listing of 4x4 Truchet tile patterns with rotational symmetry. Truchet tiles are, traditionally, square tiles that are divided by a diagonal line, and coloured with two colours, one on either side of the diagonal. Each tile can be rotated to one of four positions.



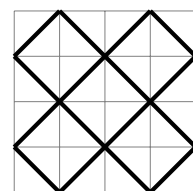
Each 4x4 Truchet tile pattern with rotational symmetry has a core 2x2 pattern in one of its quadrants that is rotated to produce the overall pattern. In this booklet, the core pattern is assumed to be in the lower left. Each pattern can be identified as a sequence of 4 digits *abcd* that list the rotational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

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

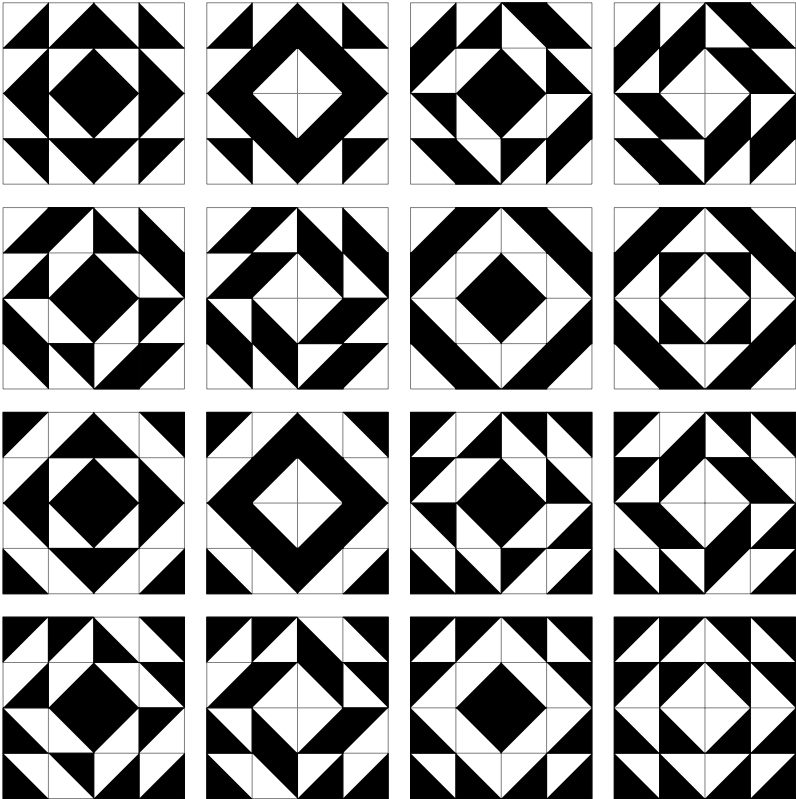
We can group these tile patterns into families where Truchet tile patterns are considered to be in the same family if they would look the same without colour – if each corresponding tile shares the same diagonal direction. The sequence that represents the family of a tile pattern can be found by taking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



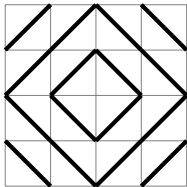
The 0110 pattern family



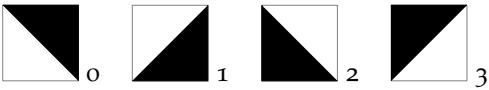
The 0110 family pattern



0000

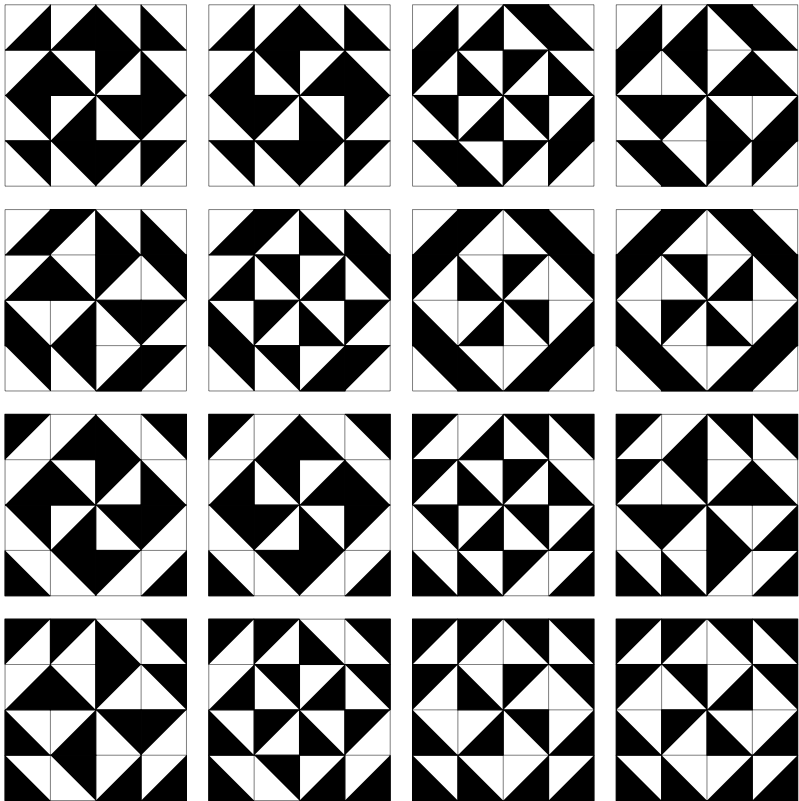
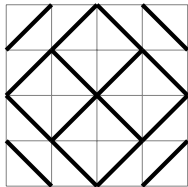


0000 0002 0020 0022
0200 0202 0220 0222
2000 2002 2020 2022
2200 2202 2220 2222

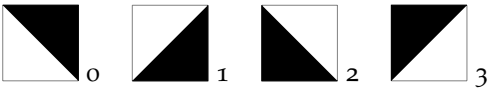


a	p	c	a
c	p	p	p
b	d	d	c
a	c	b	a

0001

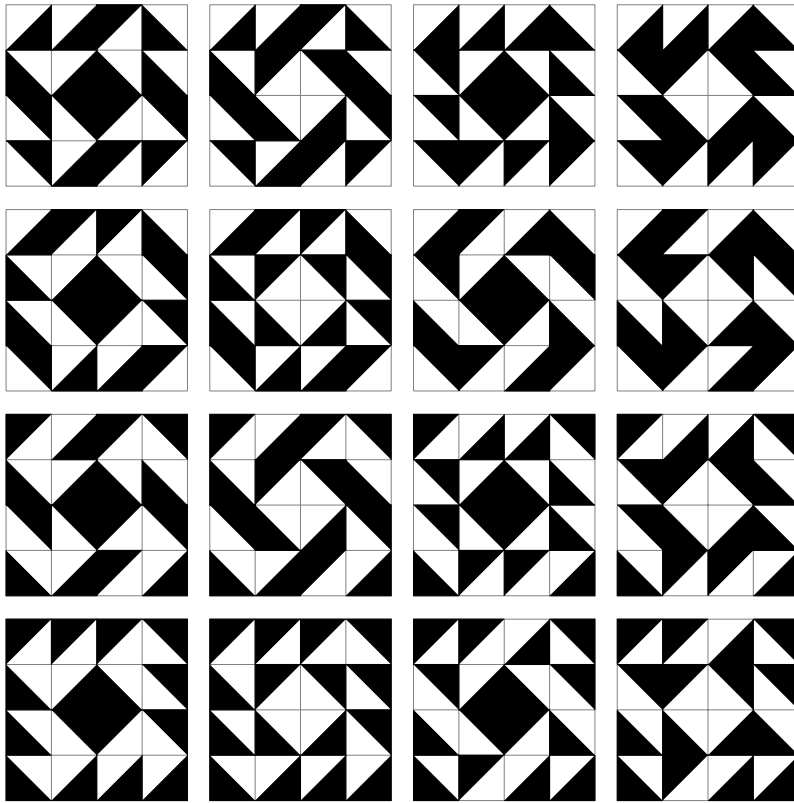
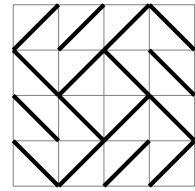


0001 0003 0021 0023
0201 0203 0221 0223
2001 2003 2021 2023
2201 2203 2221 2223

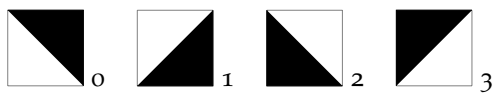


a	q	c	a
c	p	p	q
b	d	d	c
a	c	b	a

0010

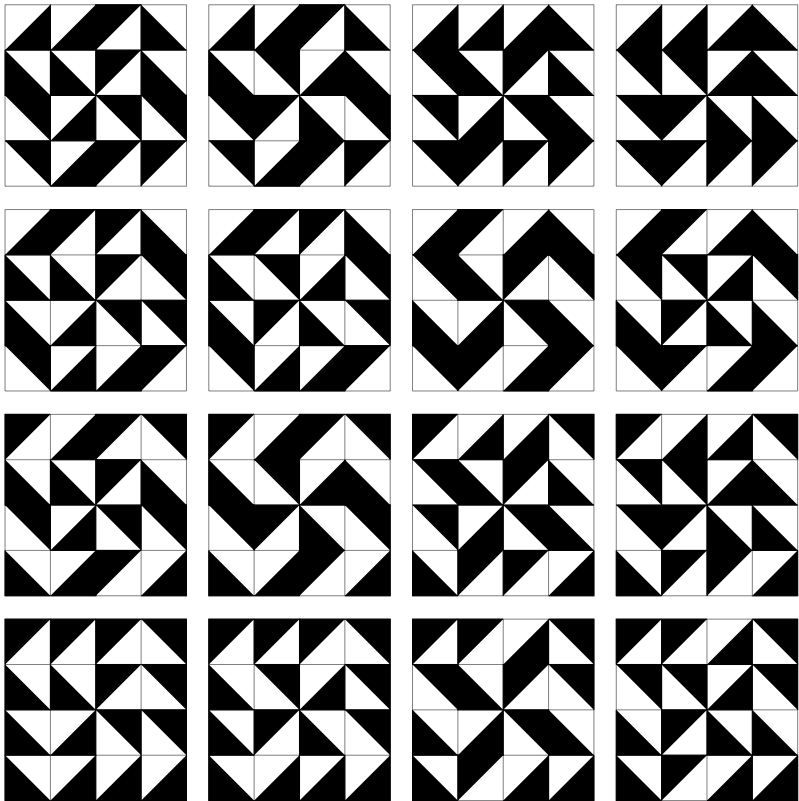
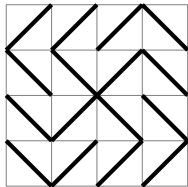


0010 0012 0030 0032
 0210 0212 0230 0232
 2010 2012 2030 2032
 2210 2212 2230 2232

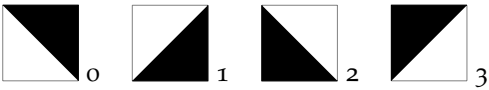


a	p	c	a
c	p	p	p
b	d	d	c
a	c	b	a

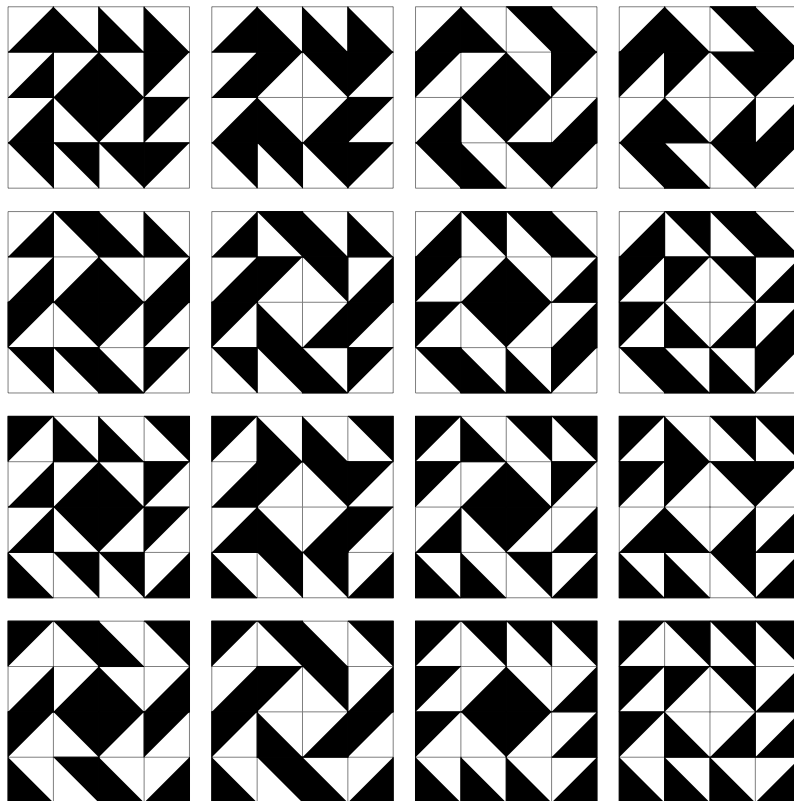
0011



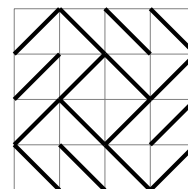
0011 0013 0031 0033
0211 0213 0231 0233
2011 2013 2031 2033
2211 2213 2231 2233



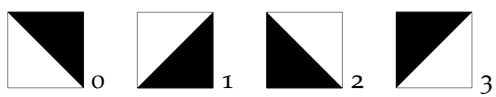
a	p	c	a
c	p	p	p
b	d	d	c
a	c	b	a



0100

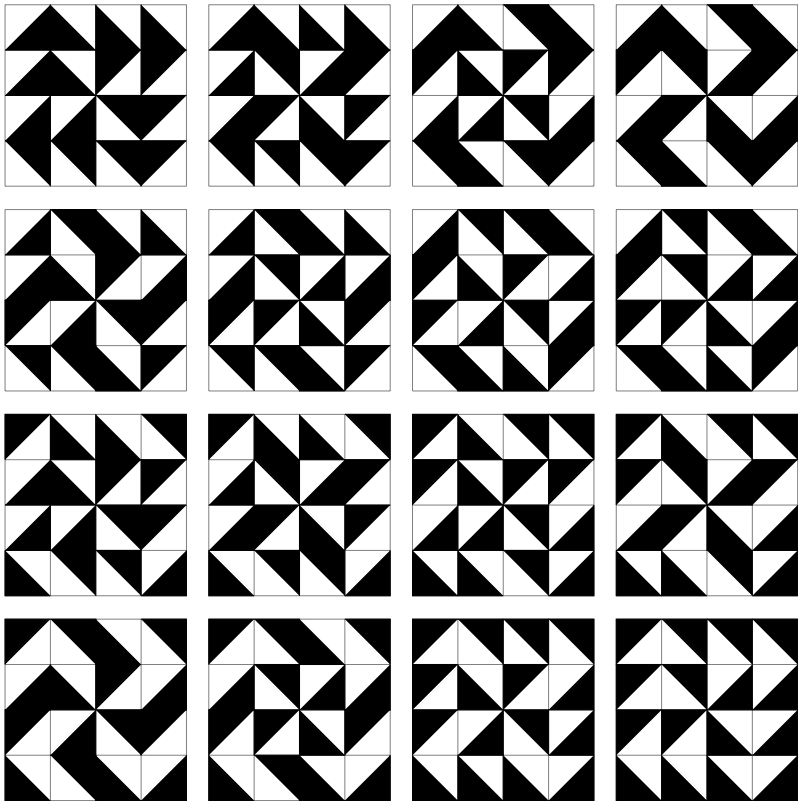
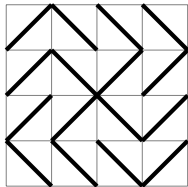


0100 0102 0120 0122
 0300 0302 0320 0322
 2100 2102 2120 2122
 2300 2302 2320 2322

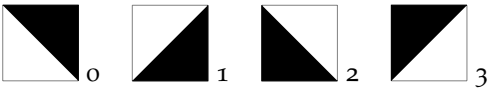


a	p	c	a
c	p	p	p
b	d	d	c
a	c	b	a

0101

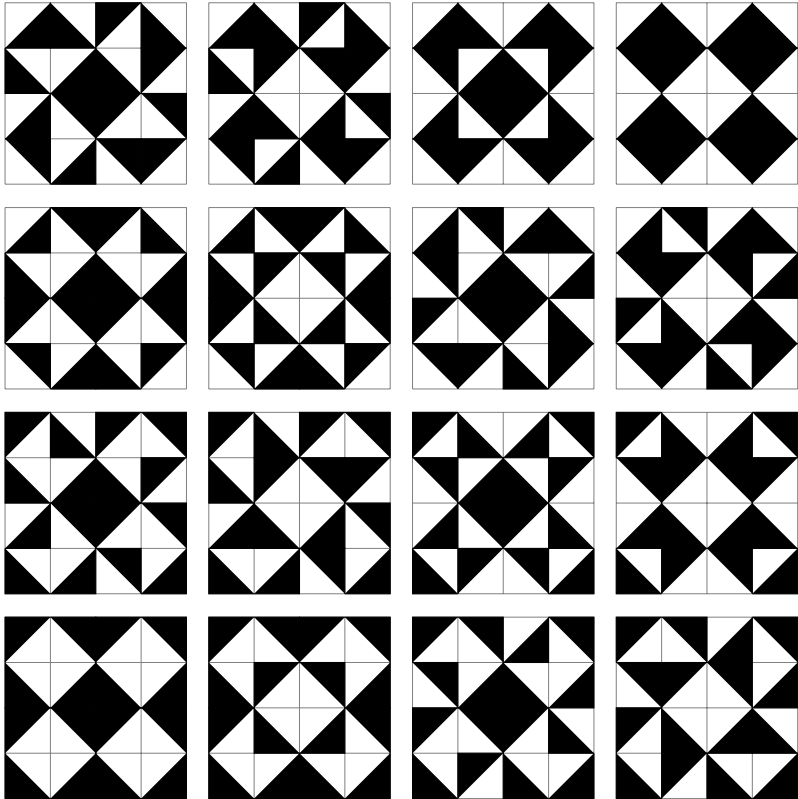
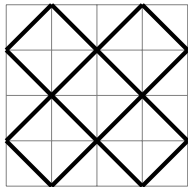


0101 0103 0121 0123
0301 0303 0321 0323
2101 2103 2121 2123
2301 2303 2321 2323

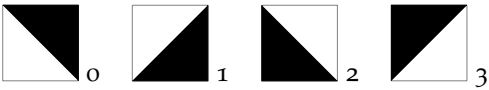


a	p	c	a
c	p	p	p
b	d	d	c
a	c	b	a

0110

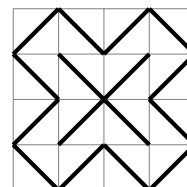


0110 0112 0130 0132
0310 0312 0330 0332
2110 2112 2130 2132
2310 2312 2330 2332

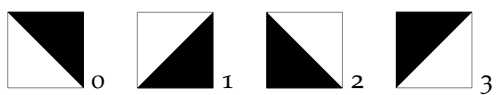


a	p	c	a
c	p	p	p
b	d	d	c
a	c	b	a

0111

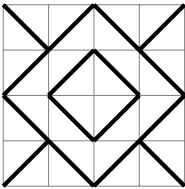
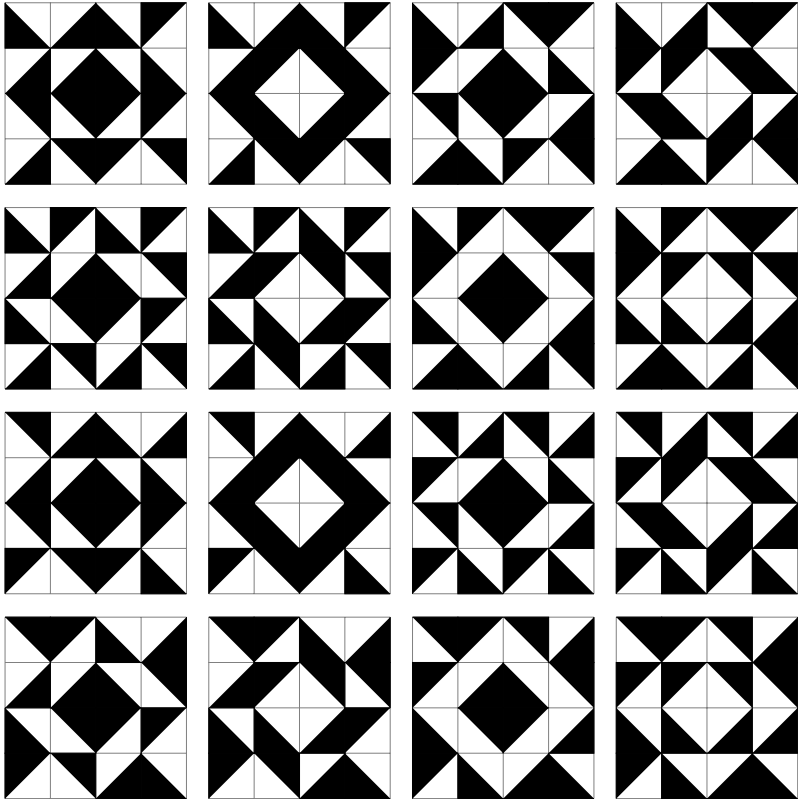


0111 0113 0131 0133
 0311 0313 0331 0333
 2111 2113 2131 2133
 2311 2313 2331 2333

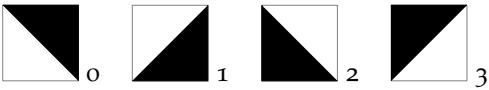


a	p	c	a
c	p	p	p
b	d	d	c
a	c	b	a

1000

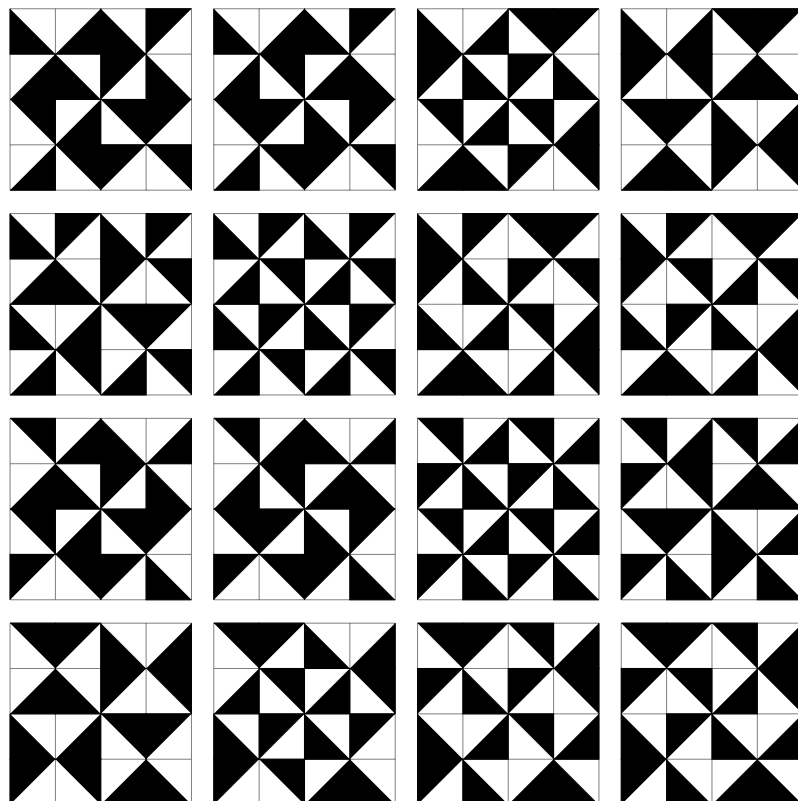
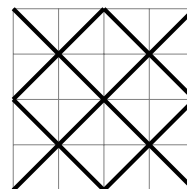


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1200 1202 1220 1222
3000 3002 3020 3022
3200 3202 3220 3222

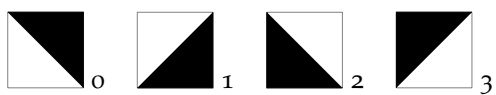


a	q	c	a
c	p	p	q
b	d	d	c
a	c	b	a

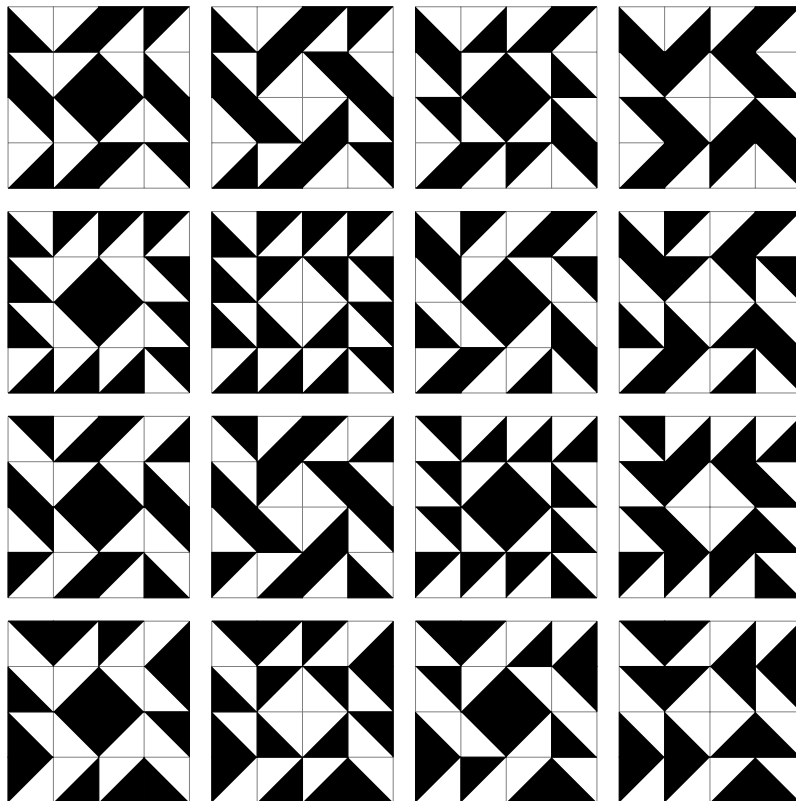
1001



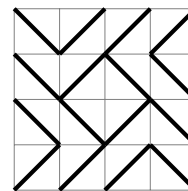
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 1201 1203 1221 1223
 3001 3003 3021 3023
 3201 3203 3221 3223



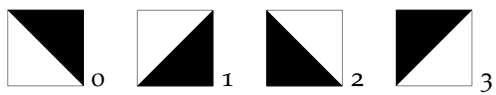
a	q	c	a
c	p	p	q
b	d	d	c
a	c	b	a



1010

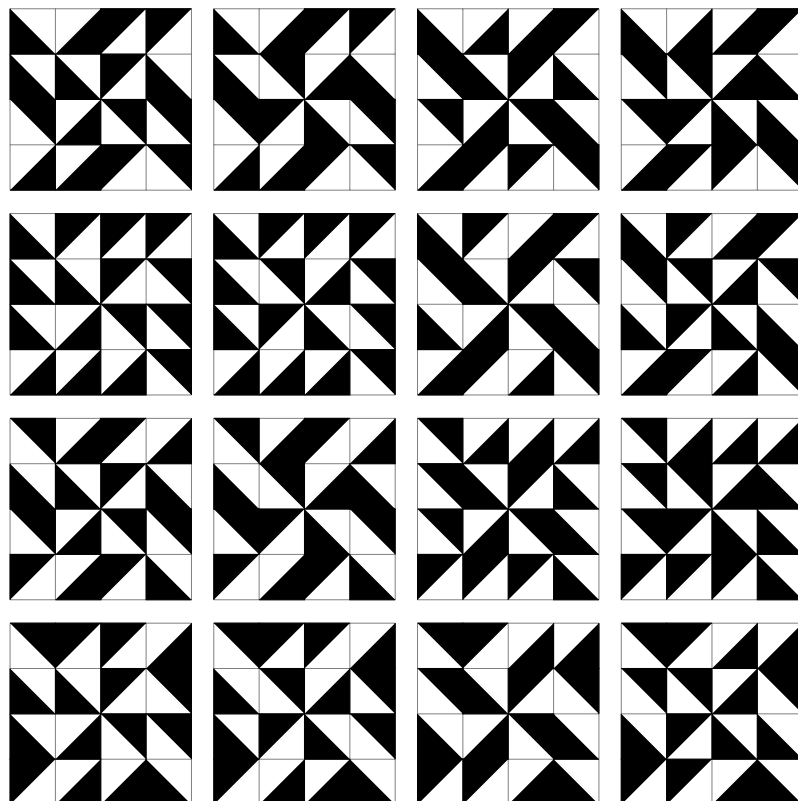
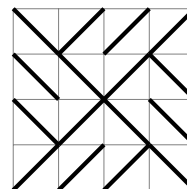


1010 1012 1030 1032
 1210 1212 1230 1232
 3010 3012 3030 3032
 3210 3212 3230 3232

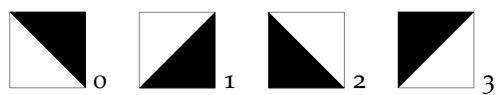


a	q	c	a
c	p	p	q
b	d	d	c
a	c	b	a

1011

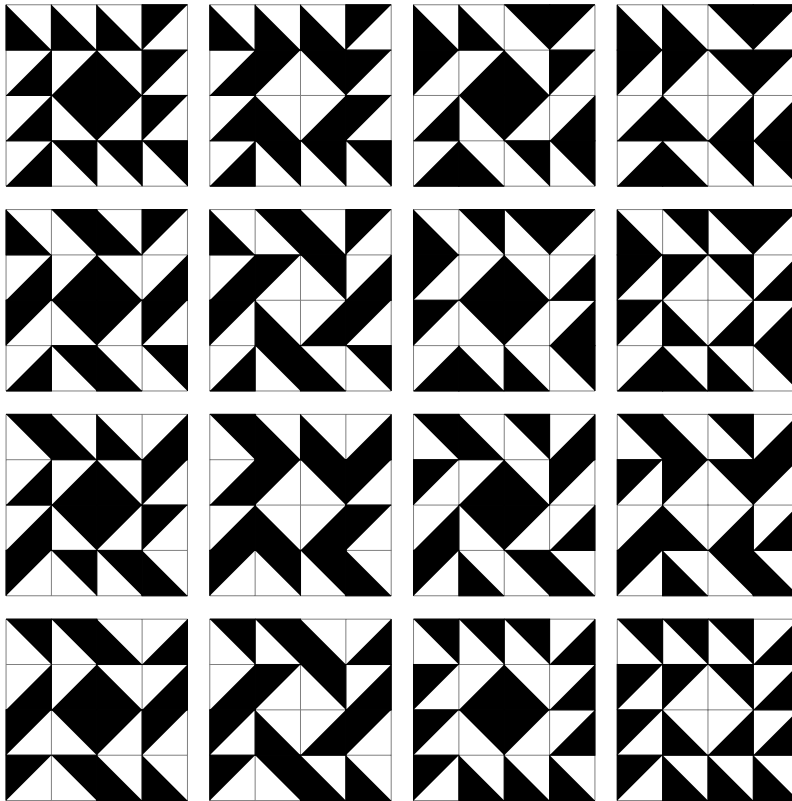
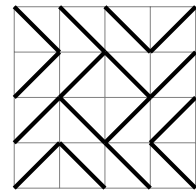


1011 1013 1031 1033
 1211 1213 1231 1233
 3011 3013 3031 3033
 3211 3213 3231 3233

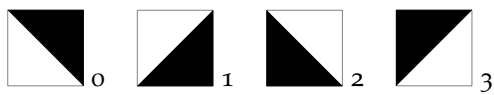


a	q	c	a
c	p	p	q
b	d	d	c
a	c	b	a

1100

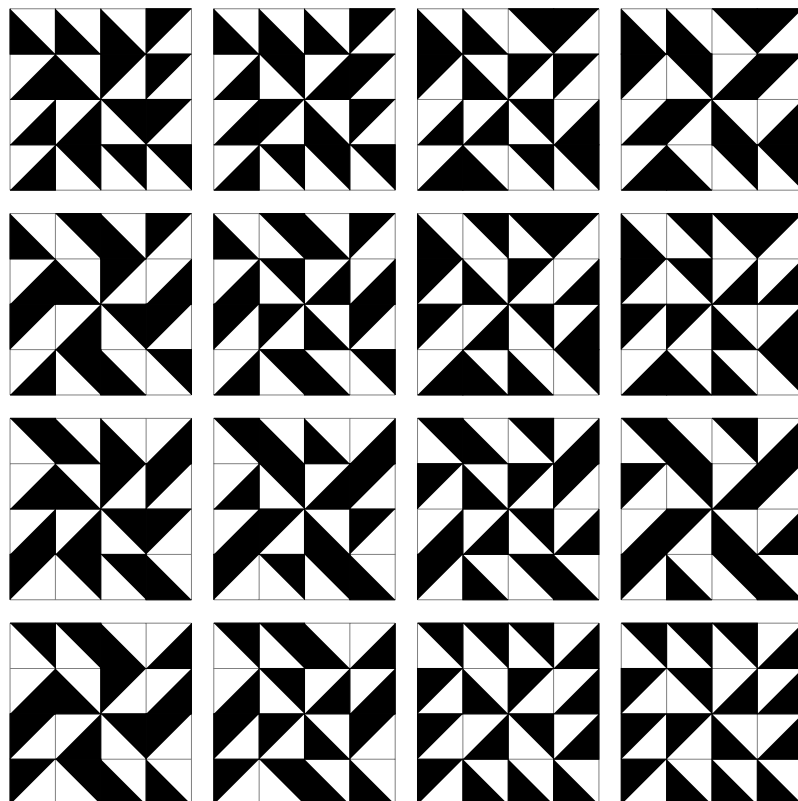
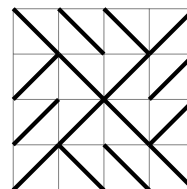


1100 1102 1120 1122
 1300 1302 1320 1322
 3100 3102 3120 3122
 3300 3302 3320 3322

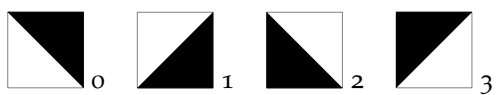


a	p	c	a
c	p	p	p
b	d	d	c
a	c	b	a

1101

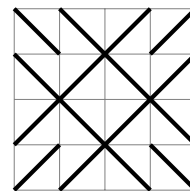
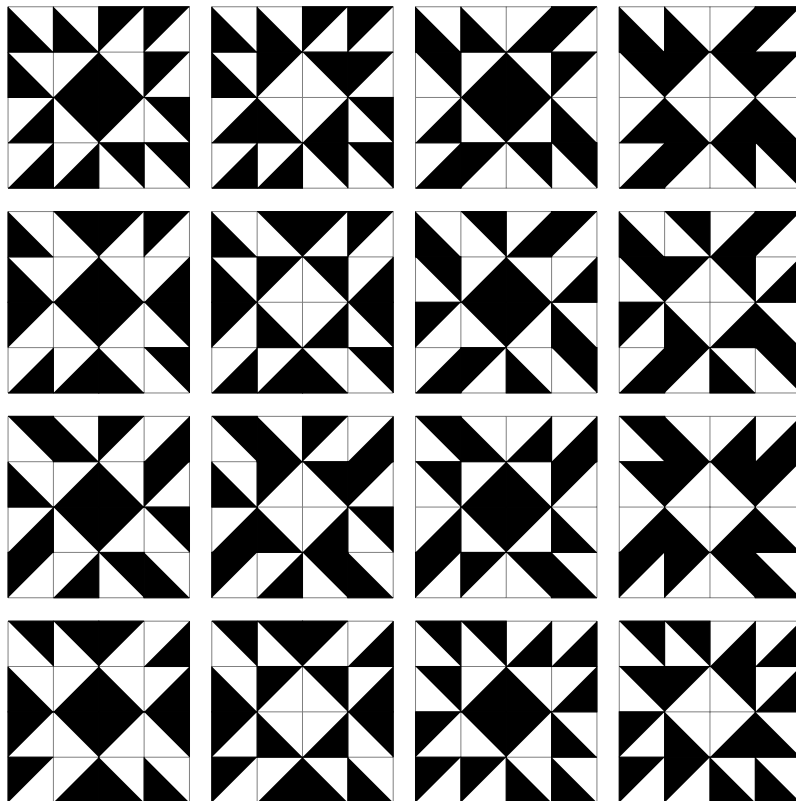


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 1301 1303 1321 1323
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 3301 3303 3321 3323

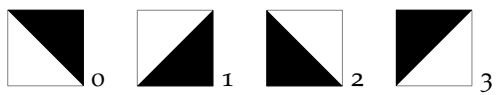


a	q	c	a
c	p	p	q
b	d	d	c
a	c	b	a

1110

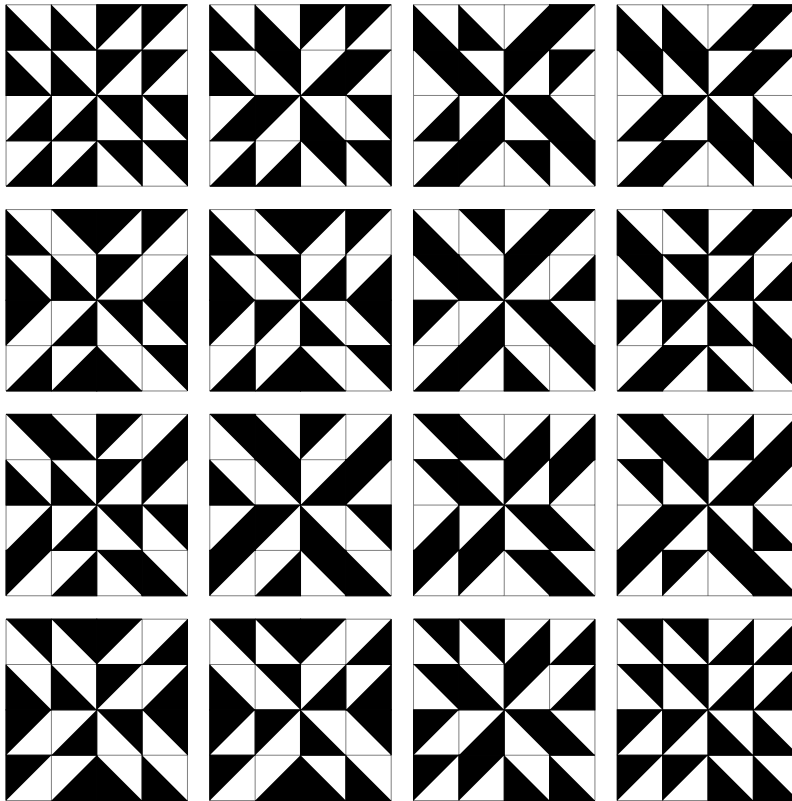
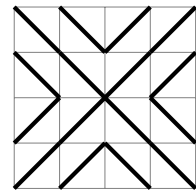


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 1310 1312 1330 1332
 3110 3112 3130 3132
 3310 3312 3330 3332

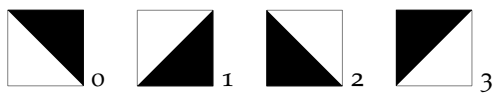


a	q	c	a
c	p	p	q
b	d	d	c
a	c	b	a

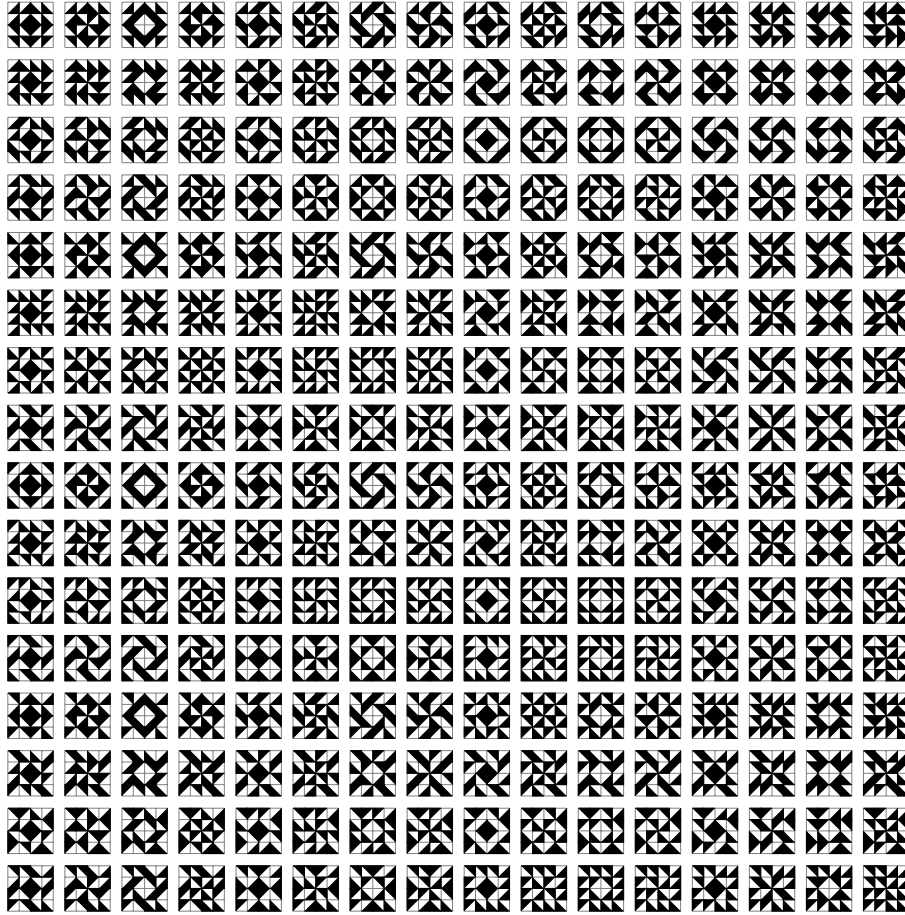
1111



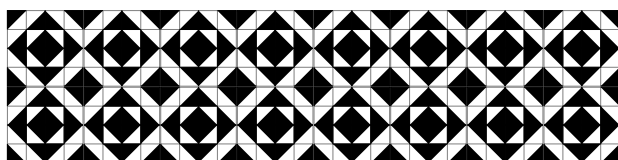
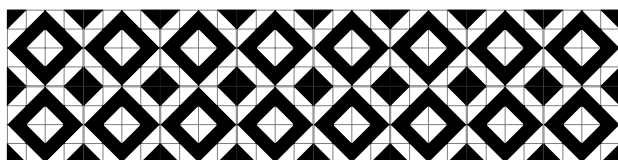
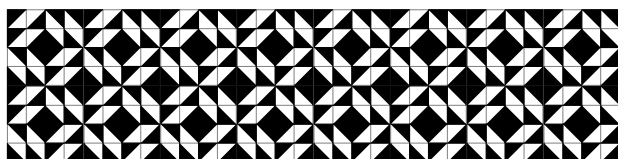
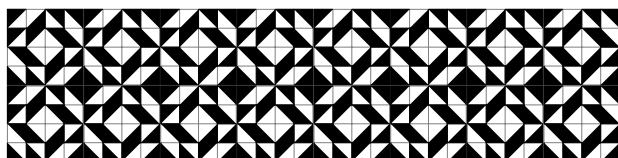
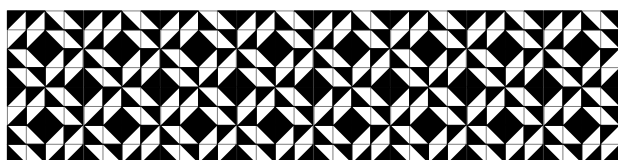
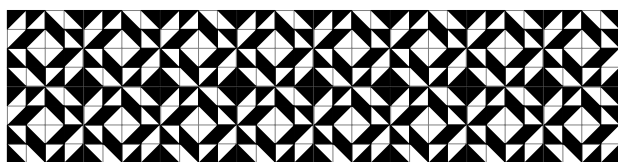
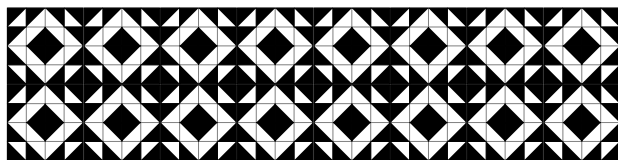
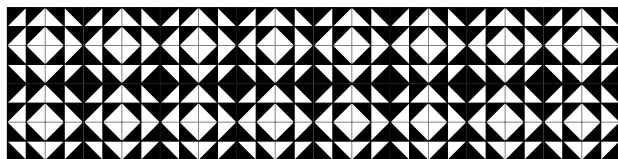
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 3111 3113 3131 3133
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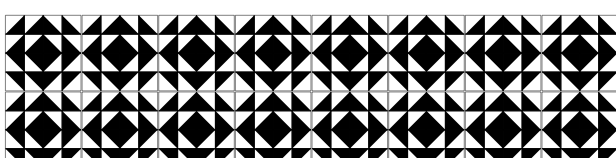
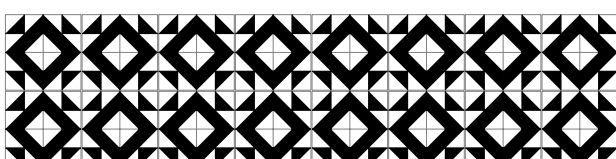
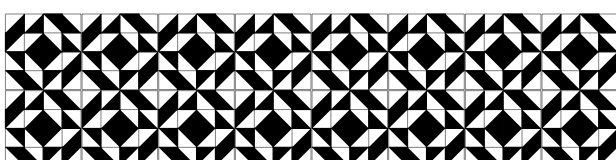
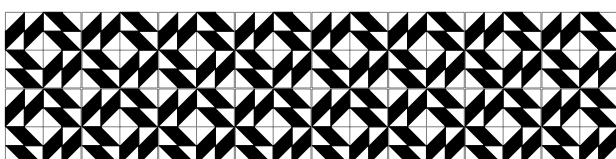
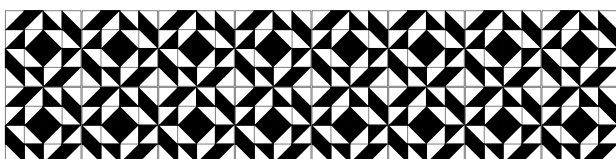
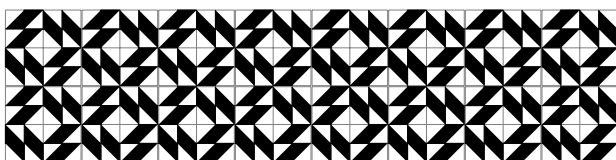
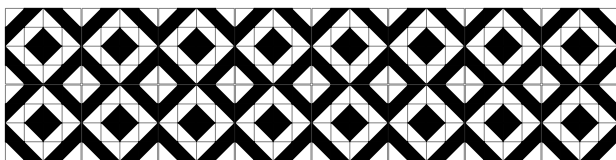
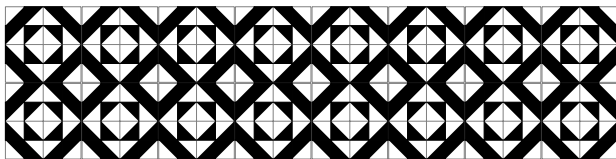


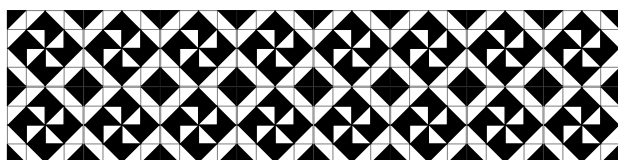
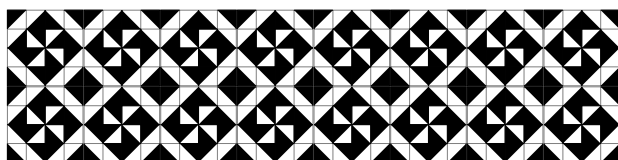
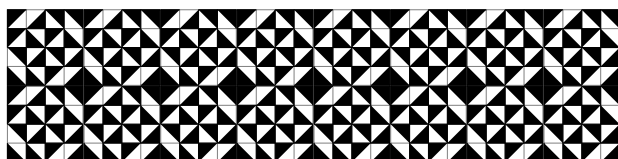
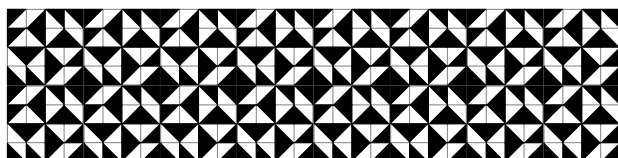
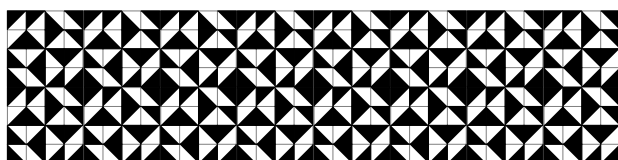
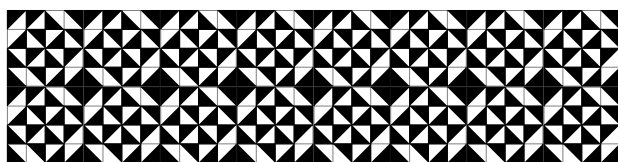
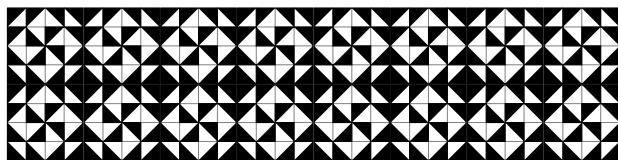
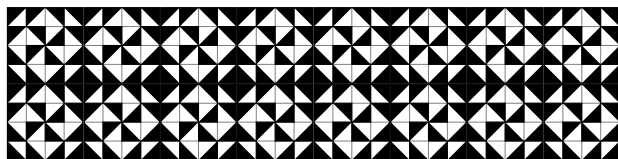
a	q	c	a
c	p	p	q
b	d	d	c
a	c	b	a

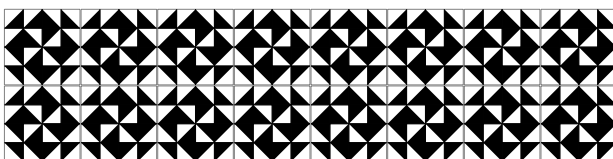
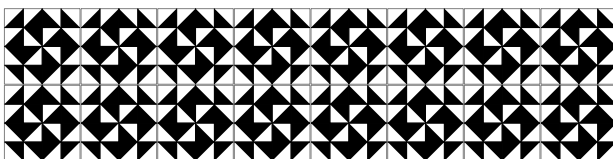
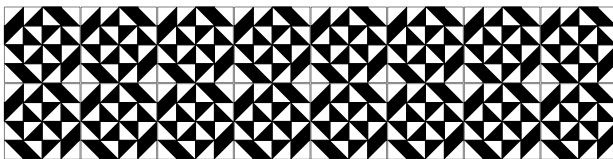
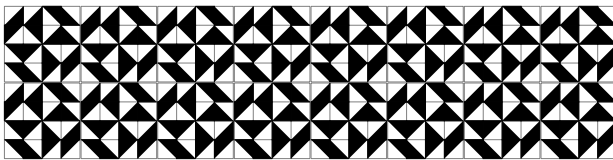
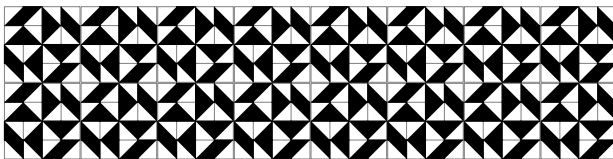
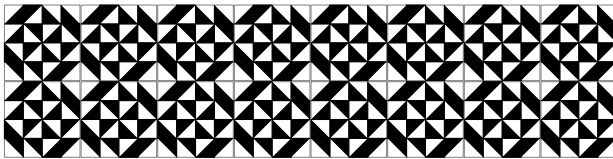
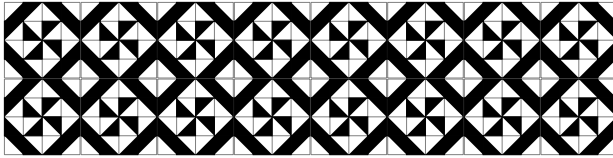
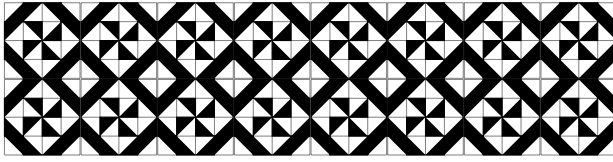


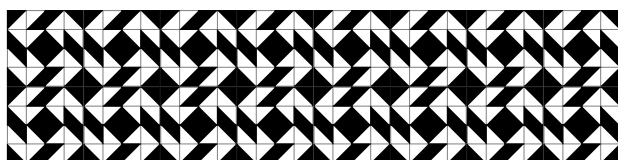
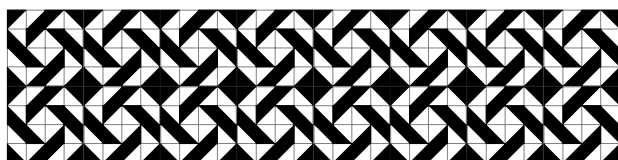
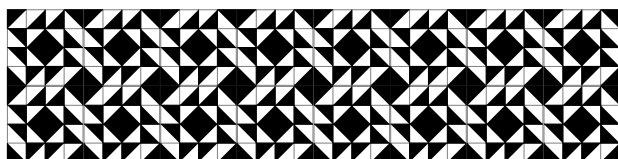
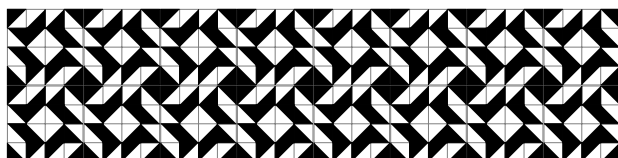
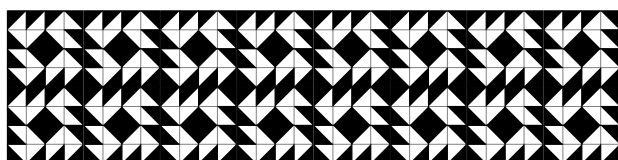
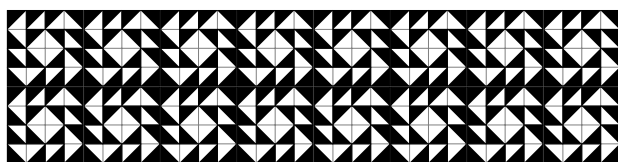
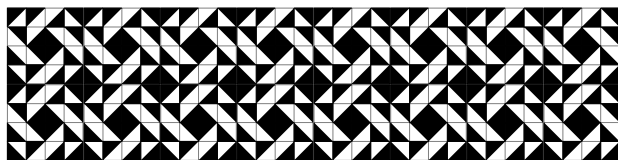
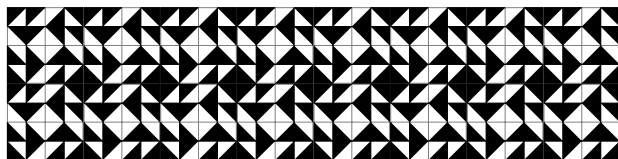
Frieze patterns for family 0000

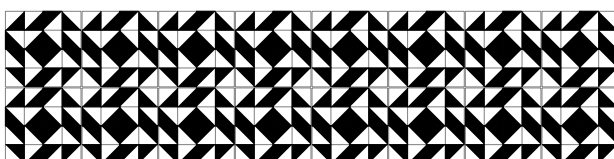
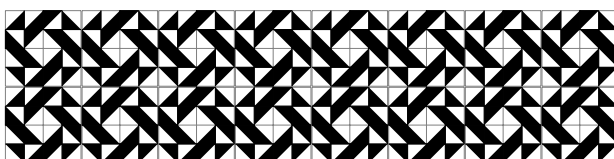
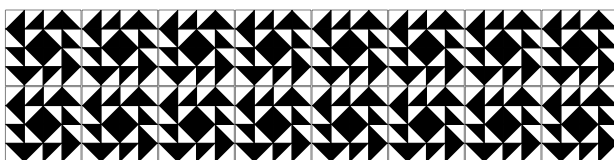
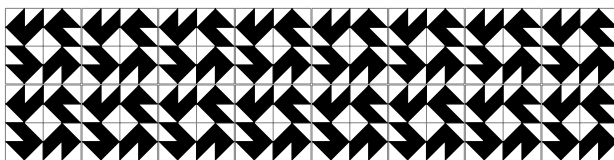
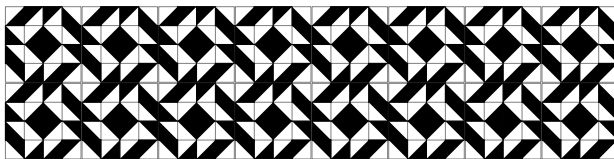
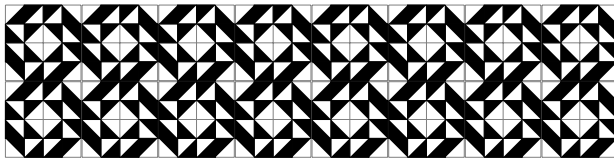
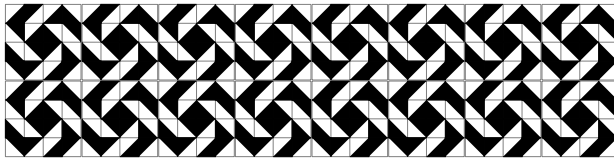
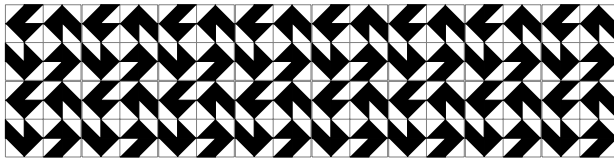


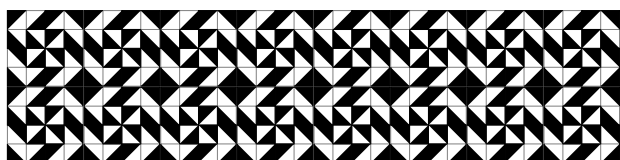
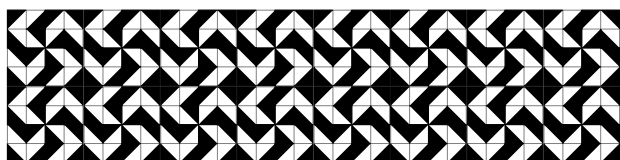
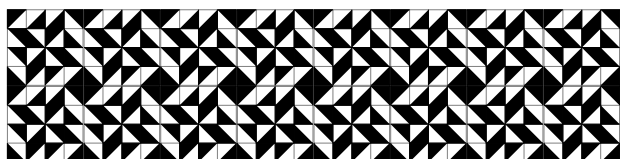
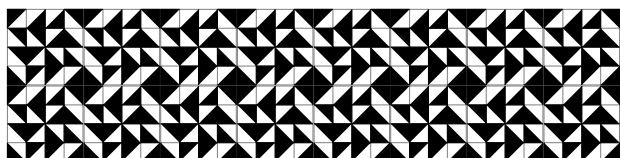
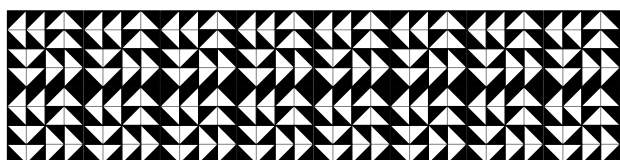
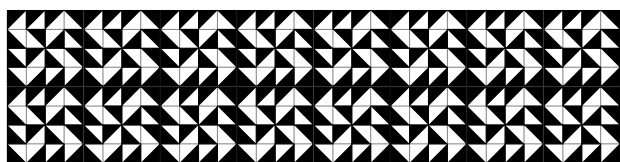
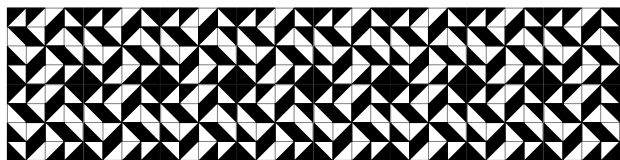
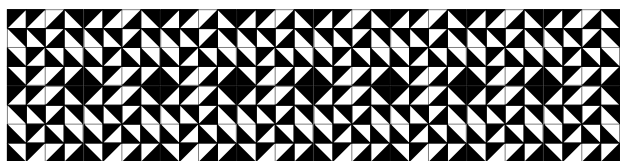


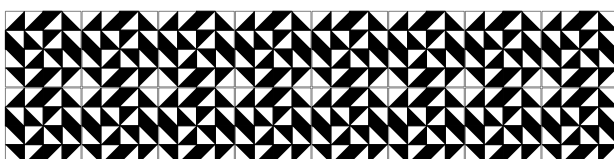
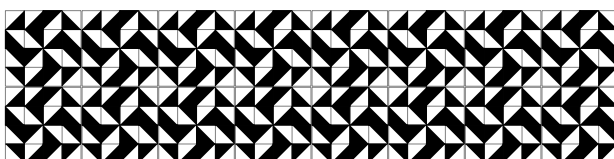
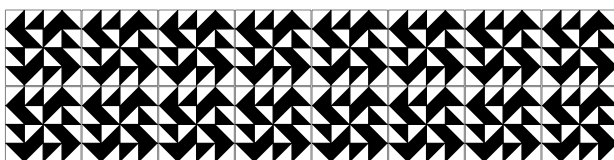
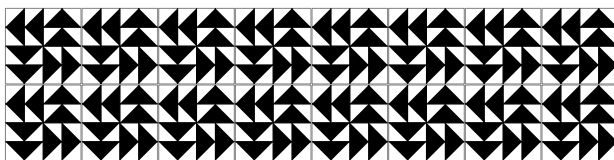
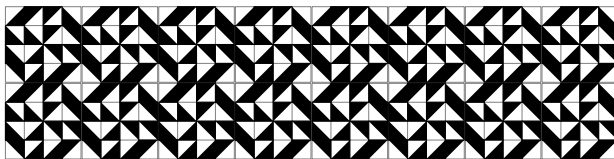
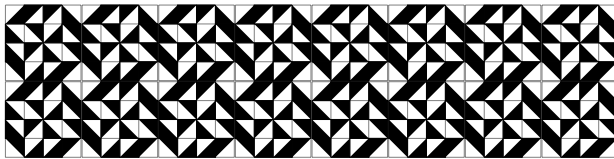
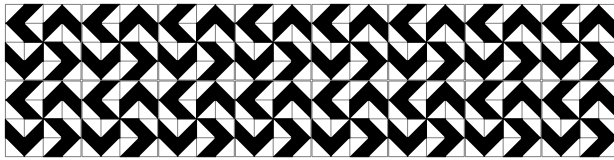
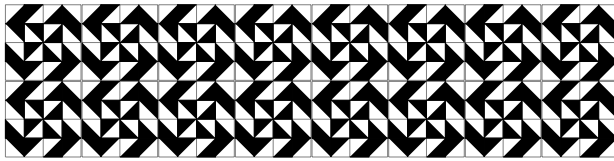
Frieze patterns for family 0001

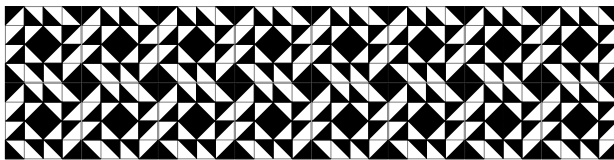
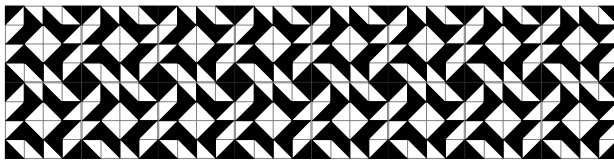
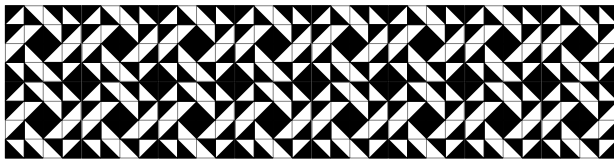
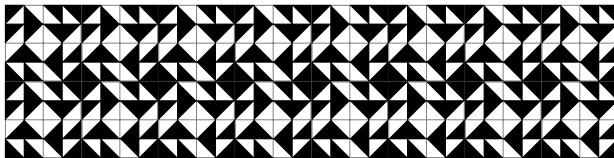
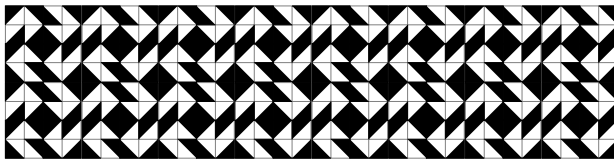
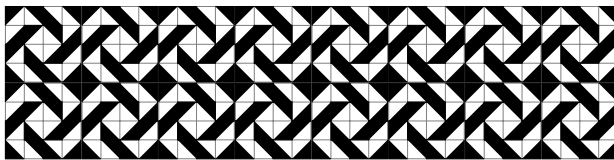
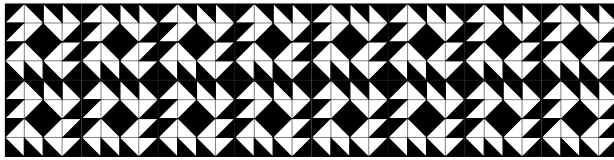
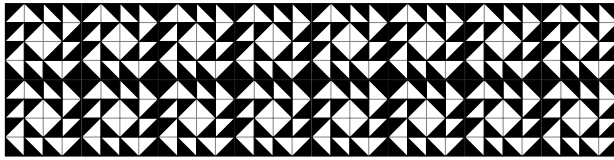


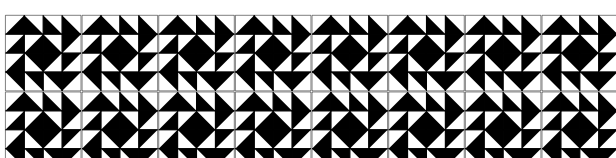
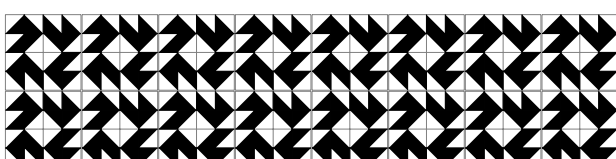
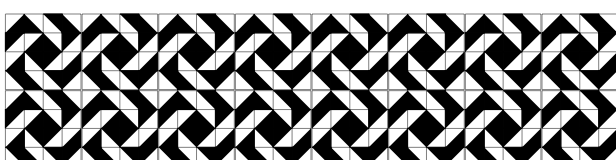
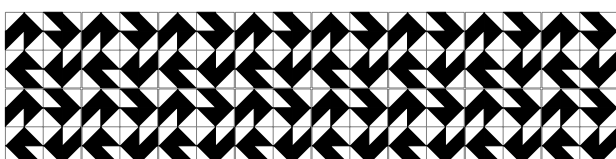
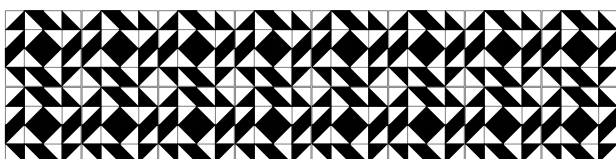
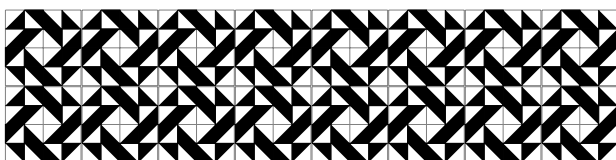
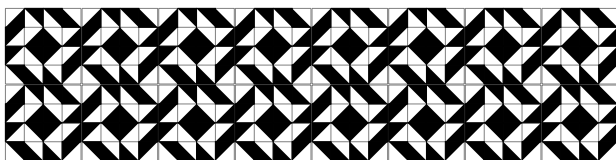
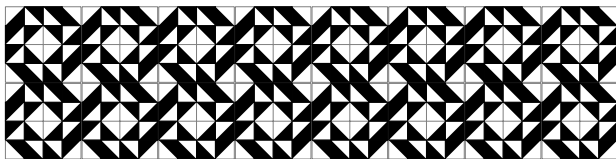
Frieze patterns for family 0010

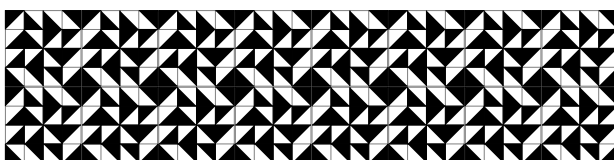
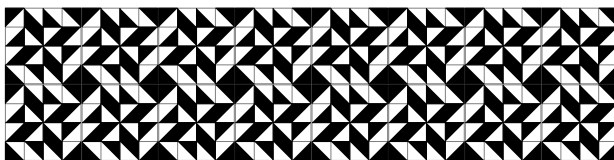
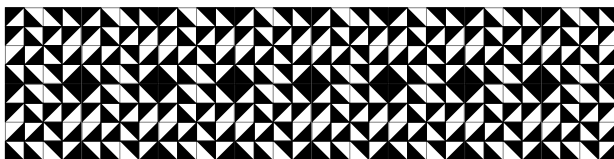
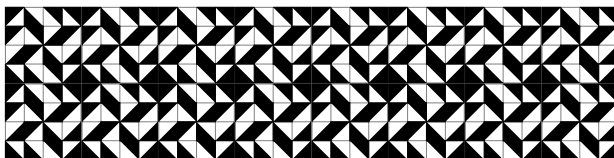
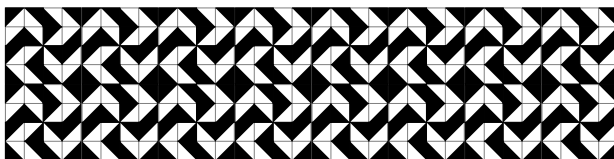
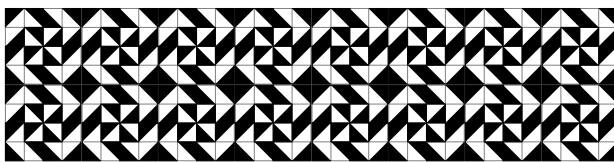
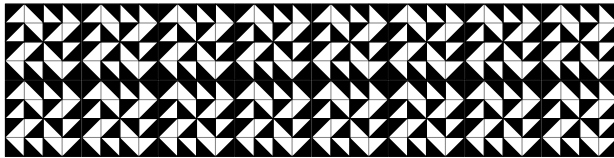
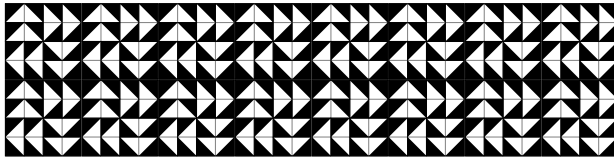


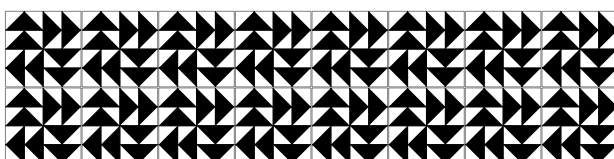
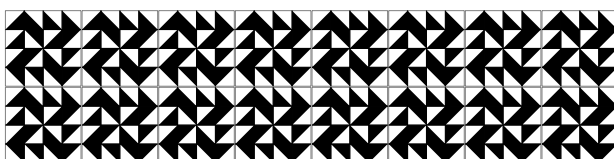
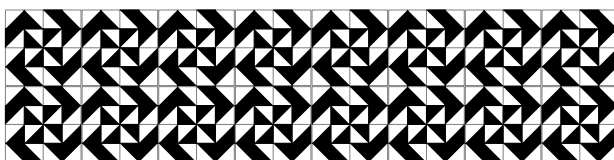
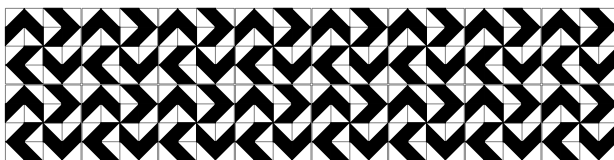
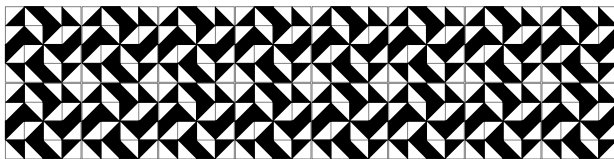
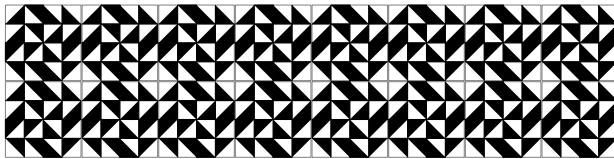
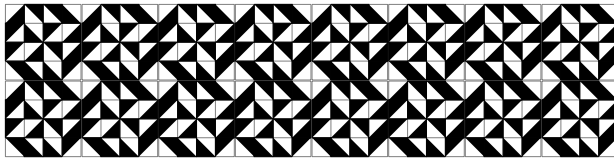
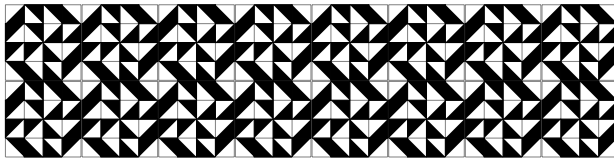
Frieze patterns for family 0011

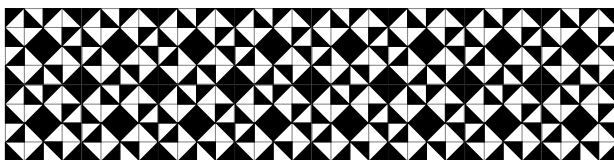
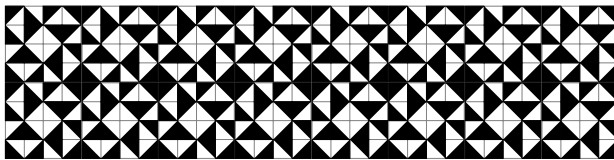
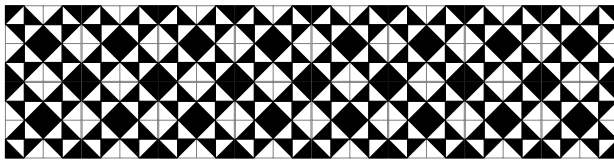
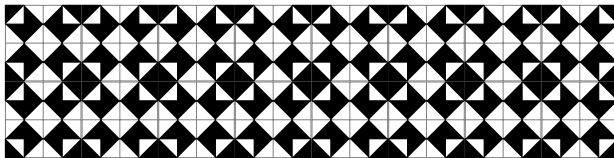
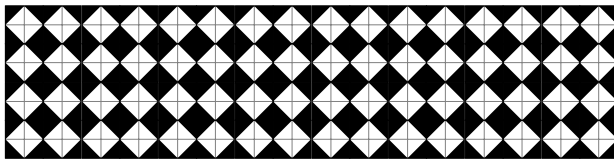
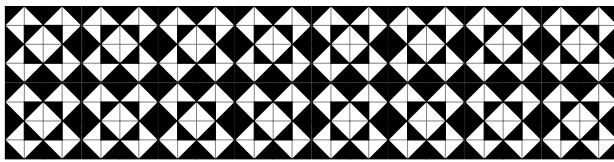
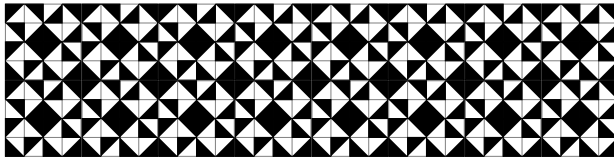
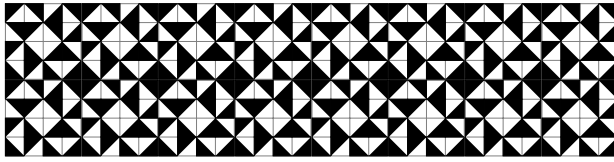


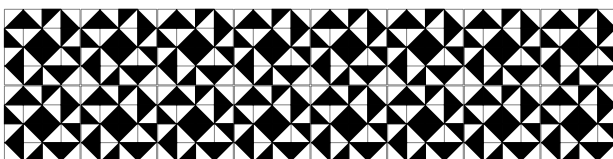
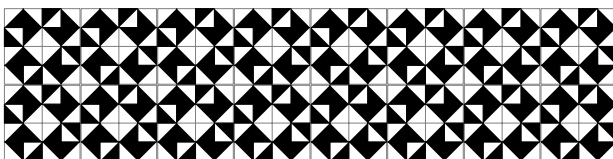
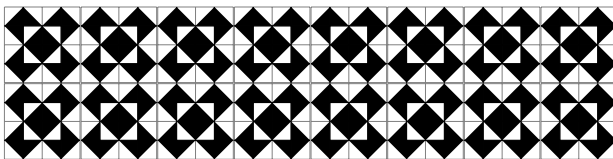
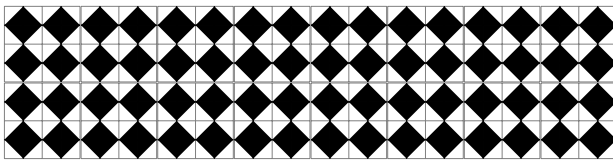
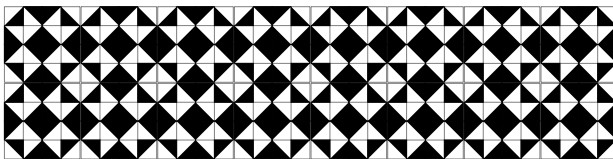
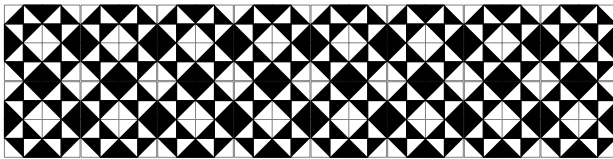
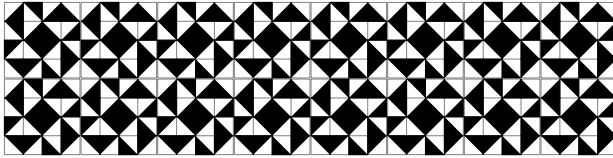
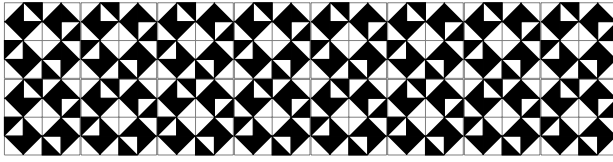
Frieze patterns for family 0100

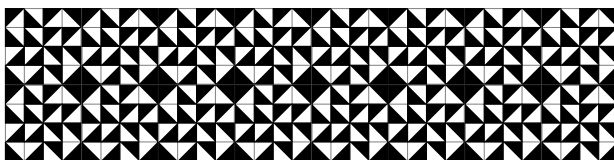
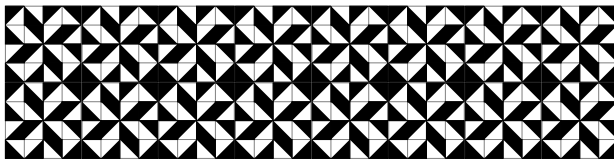
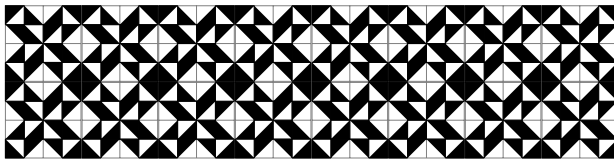
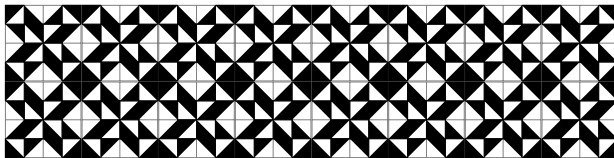
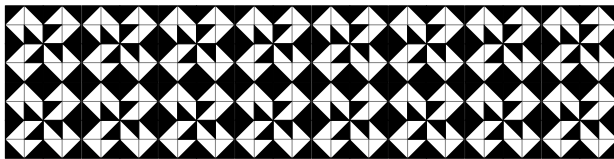
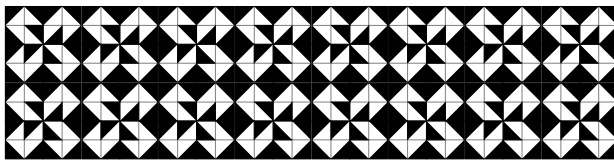
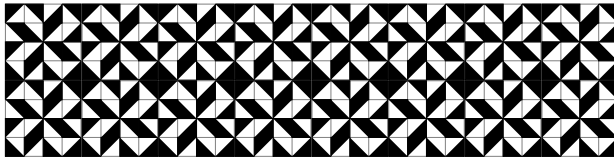
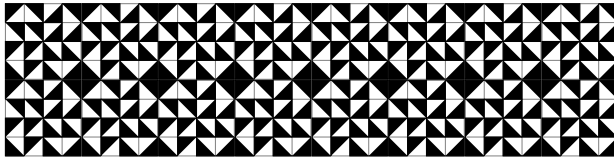


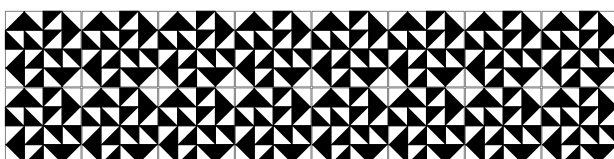
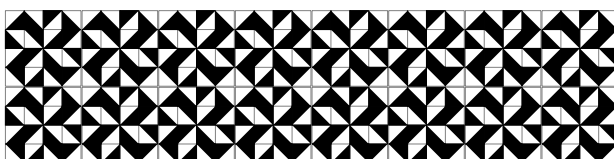
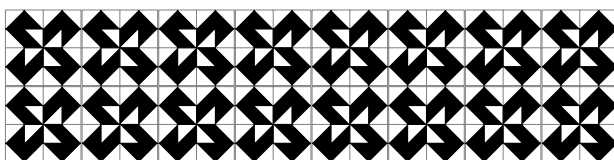
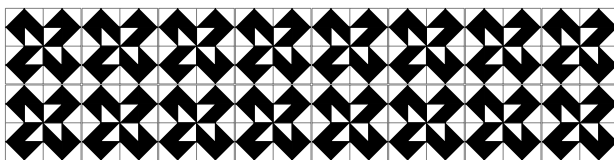
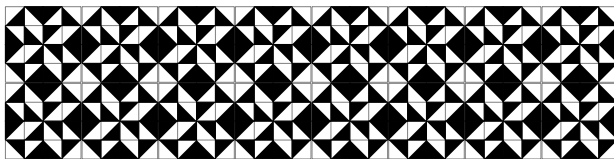
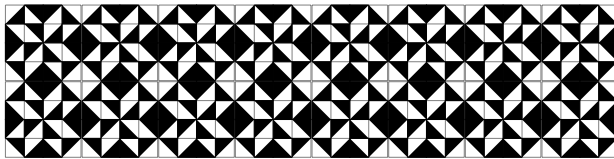
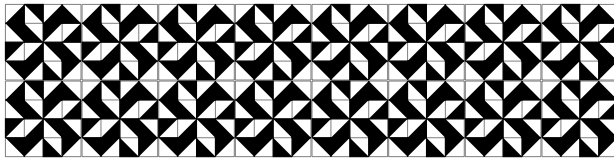
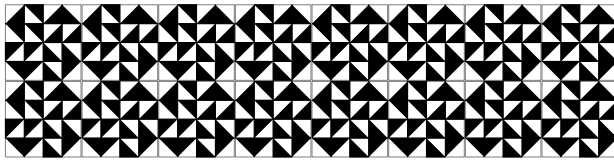
Frieze patterns for family 0101

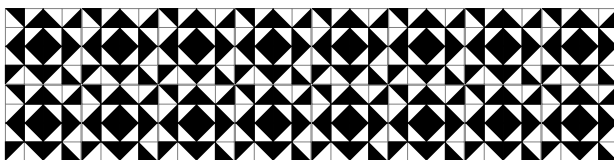
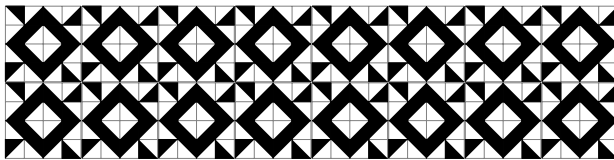
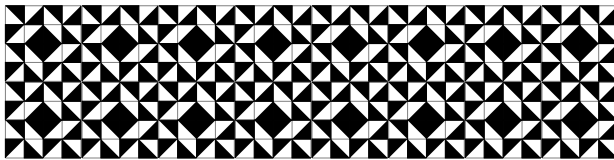
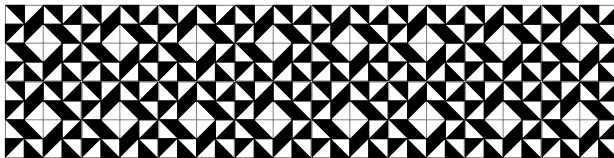
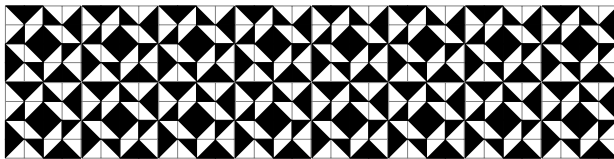
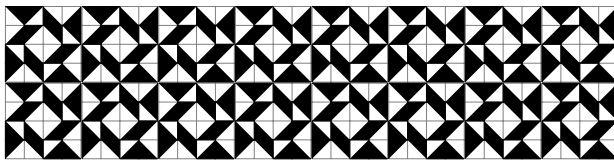
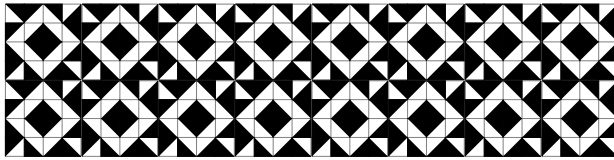
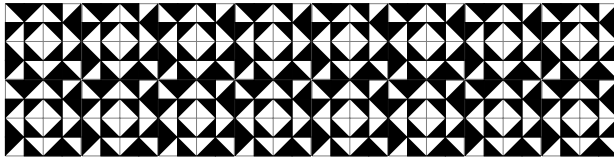


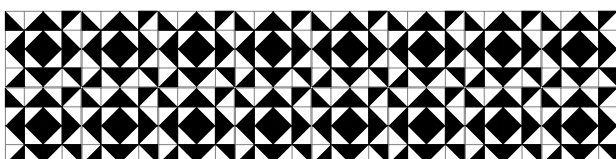
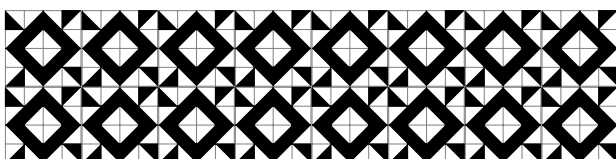
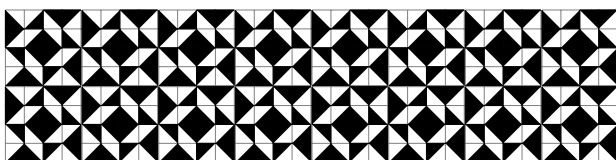
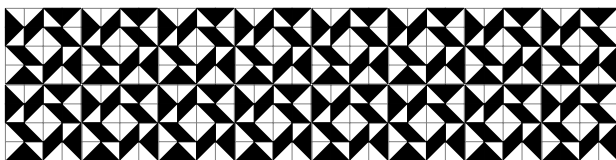
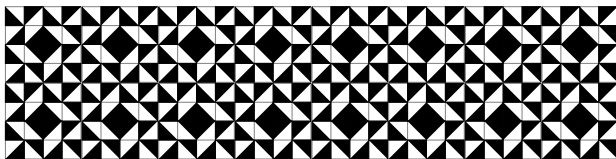
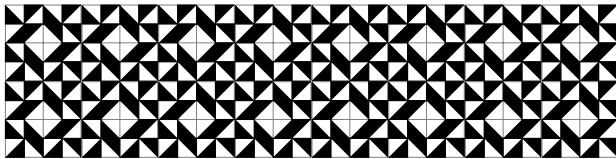
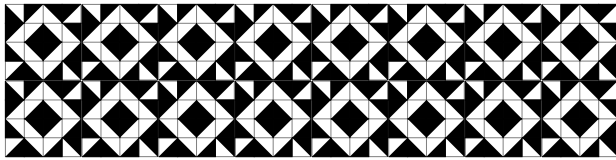
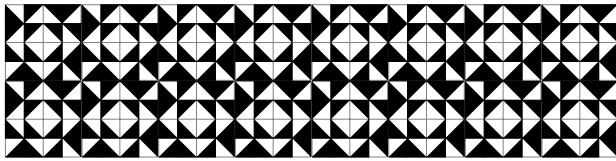
Frieze patterns for family 0110



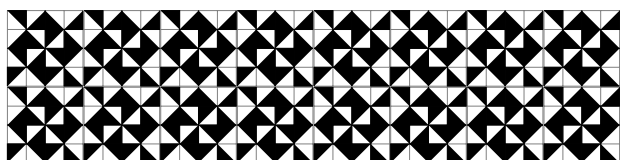
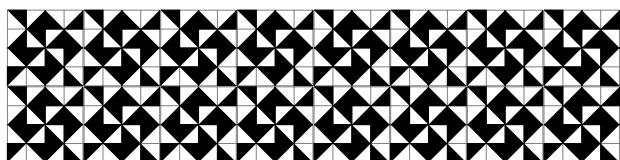
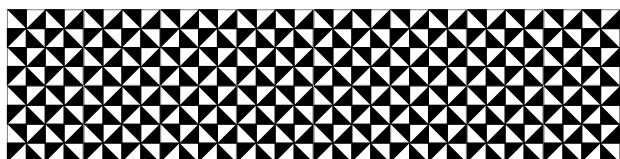
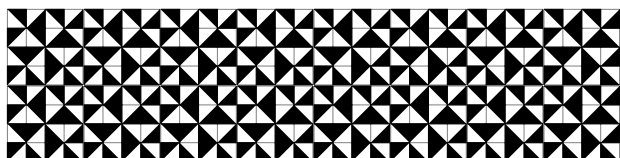
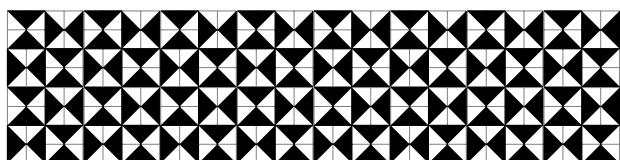
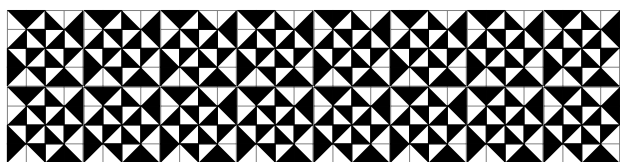
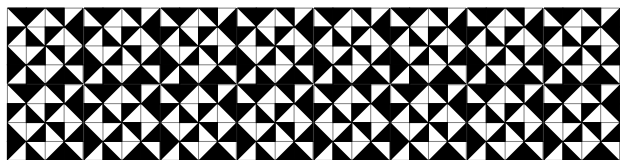
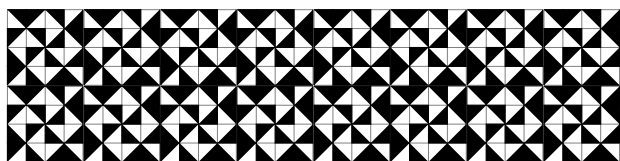
Frieze patterns for family 0111

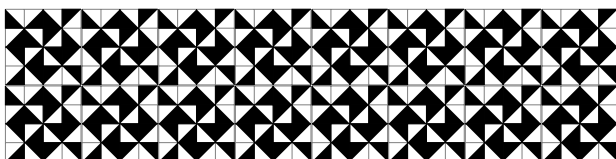
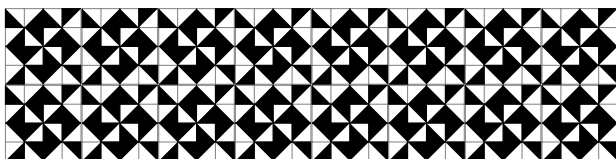
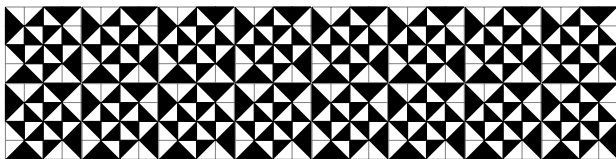
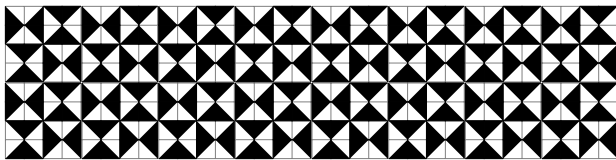
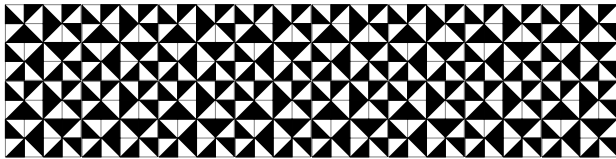
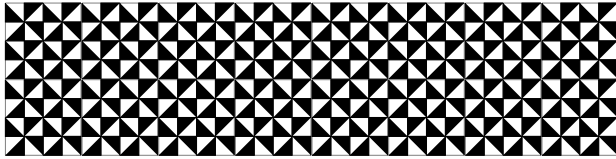
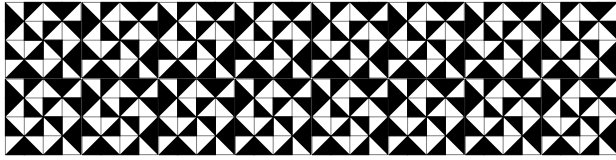
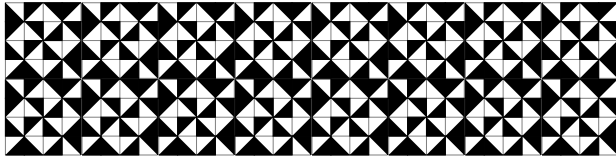


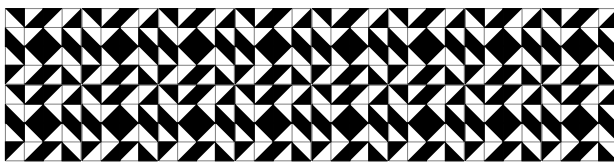
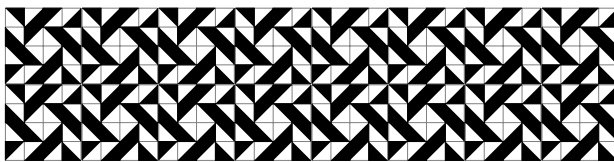
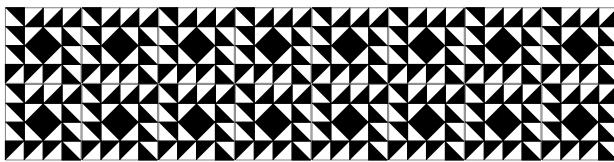
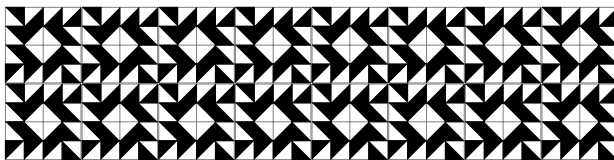
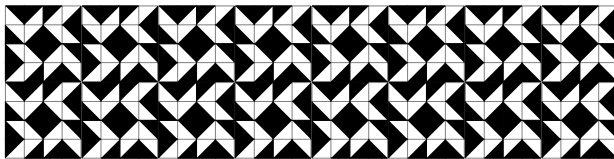
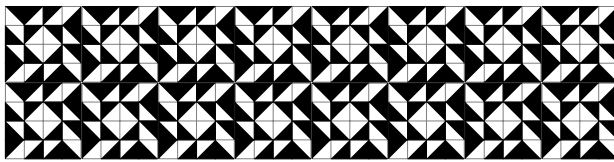
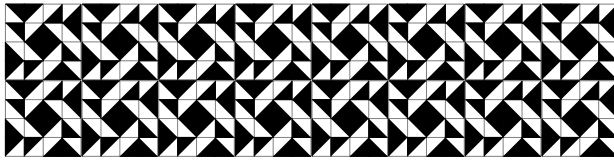
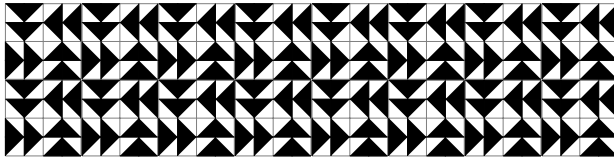
Frieze patterns for family 1000

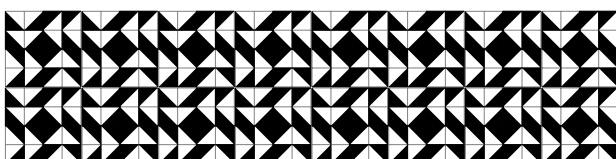
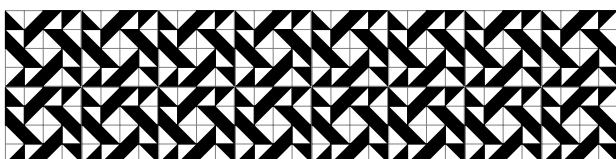
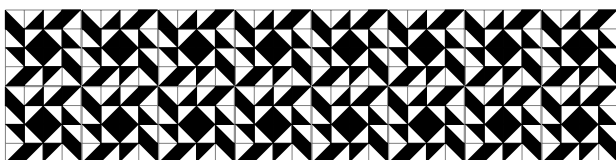
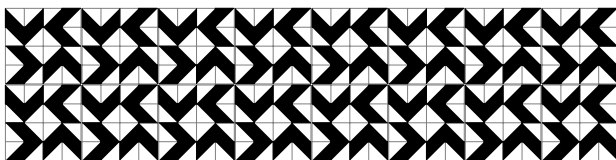
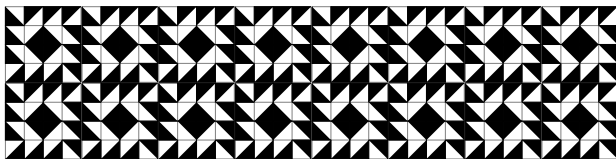
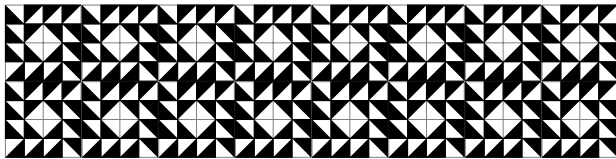
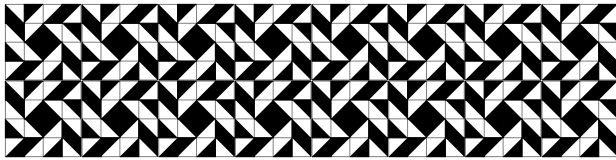
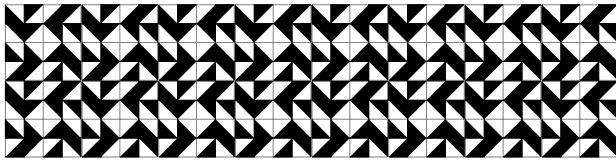


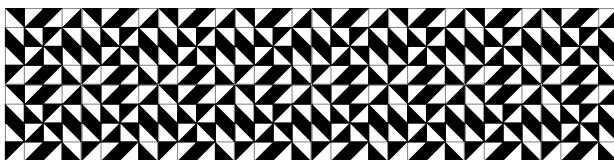
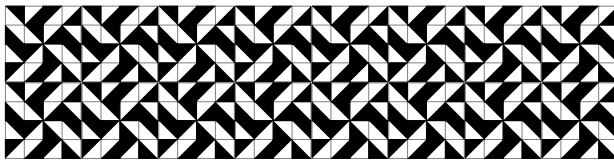
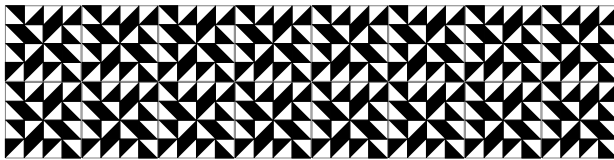
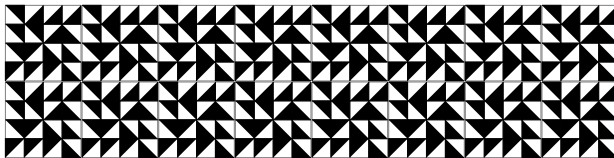
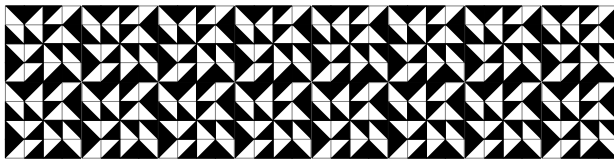
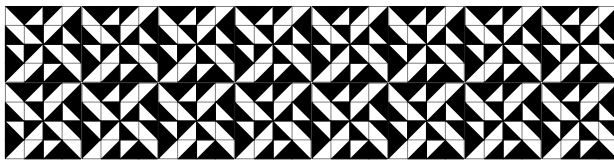
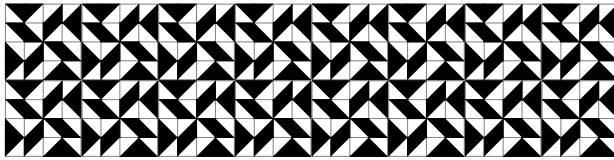
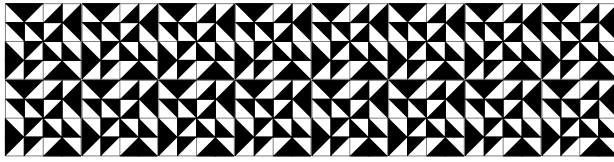
Frieze patterns for family 1001

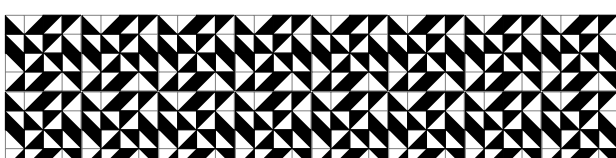
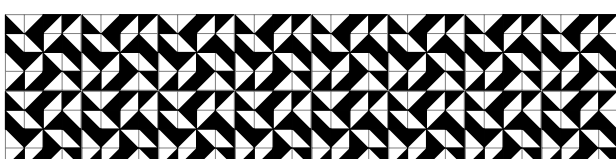
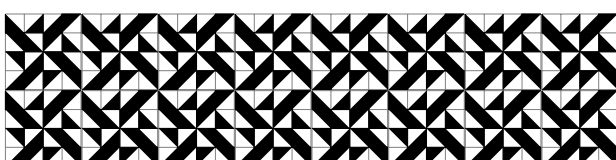
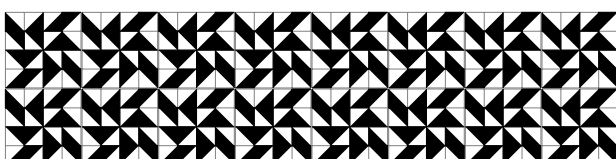
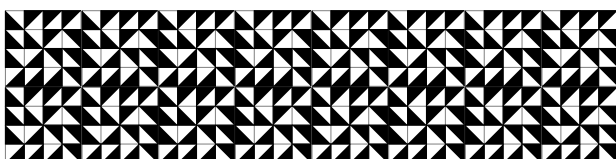
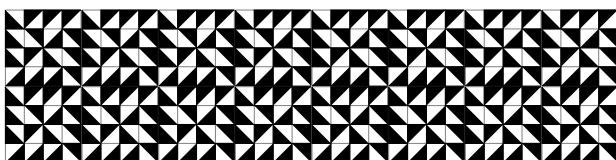
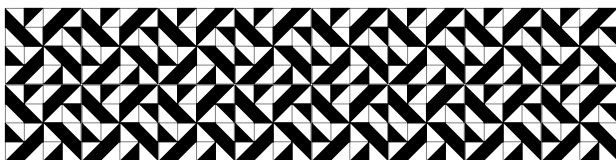
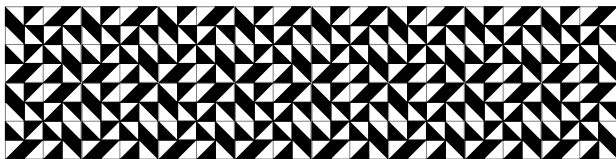


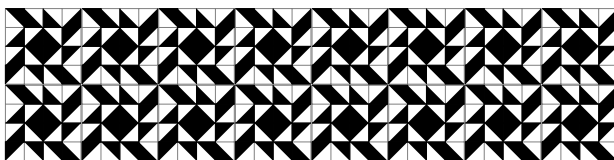
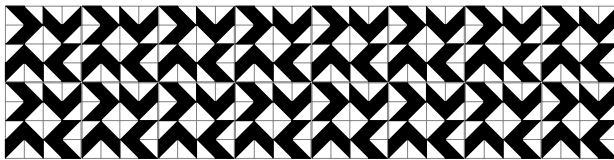
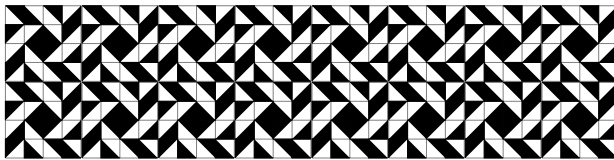
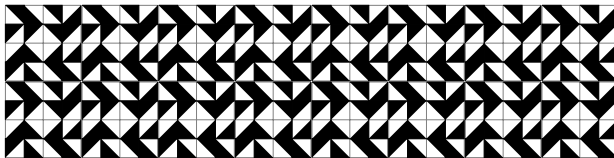
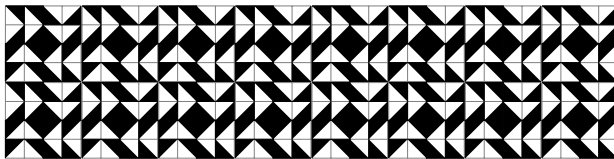
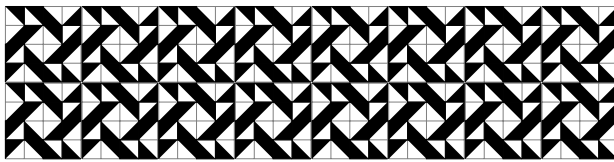
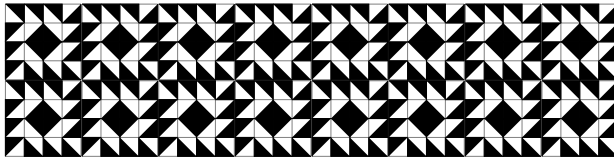
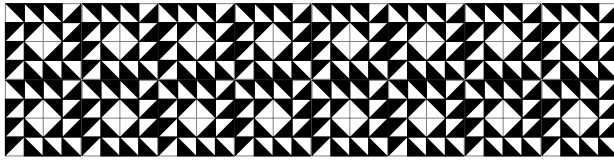


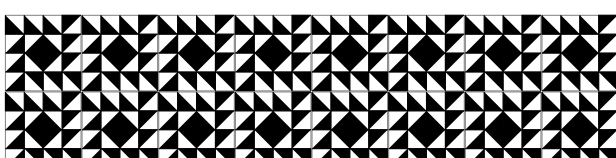
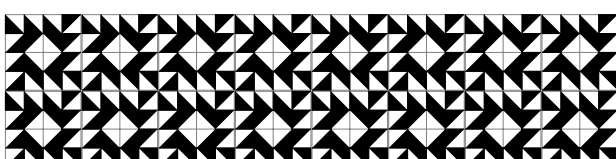
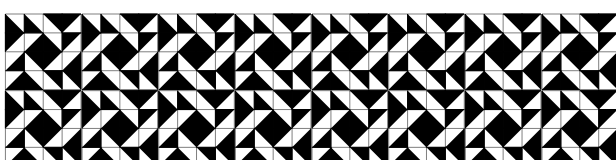
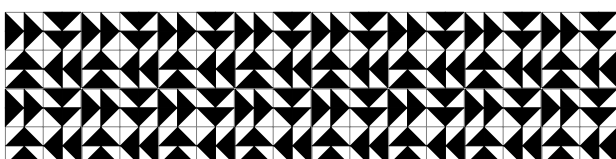
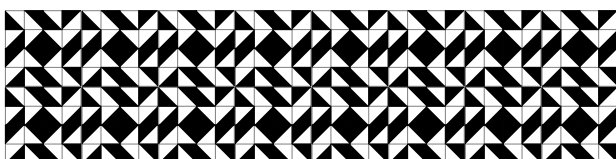
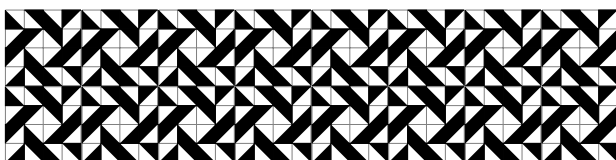
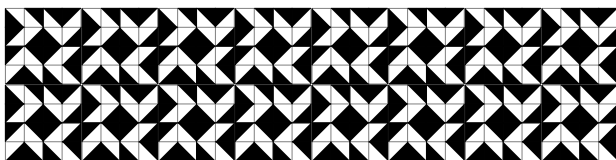
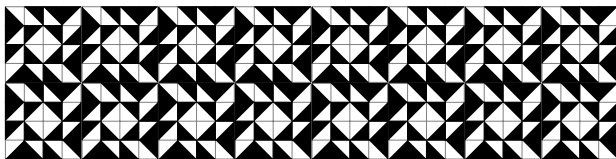
Frieze patterns for family 1010



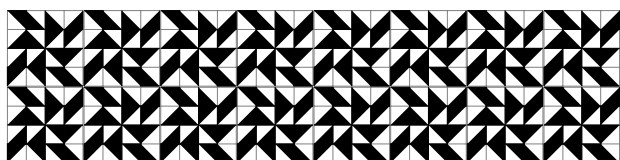
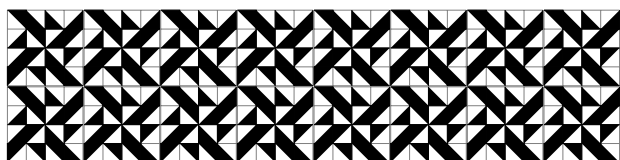
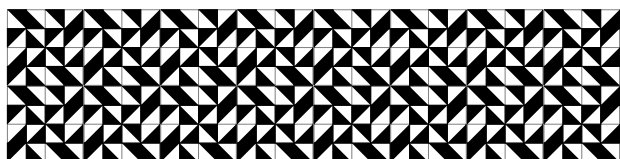
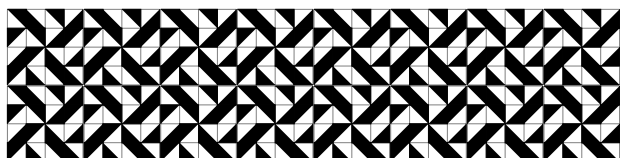
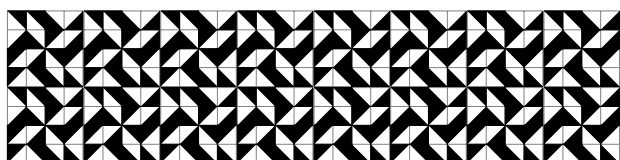
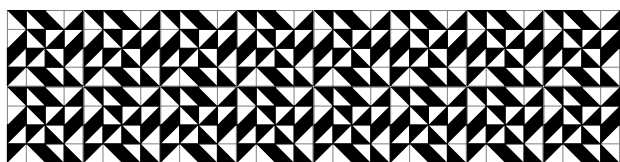
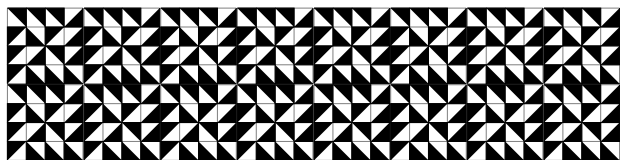
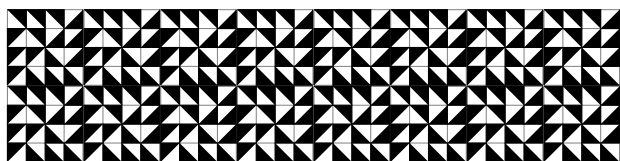
Frieze patterns for family 1011

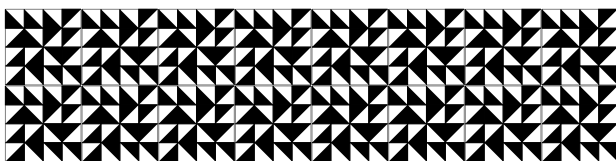
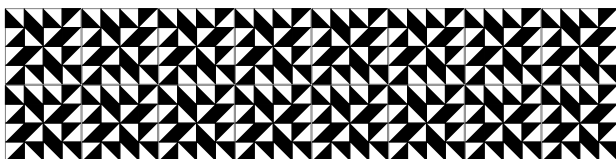
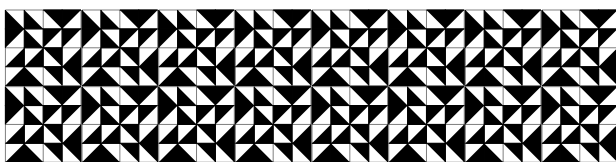
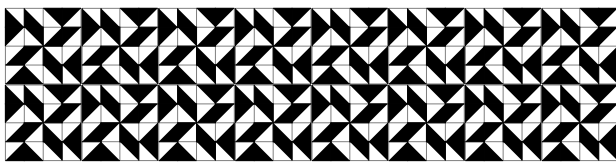
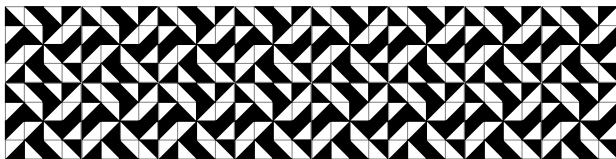
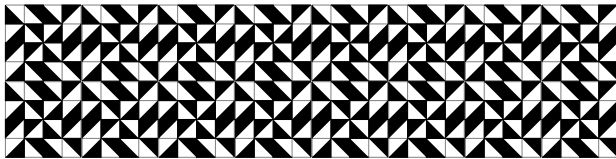
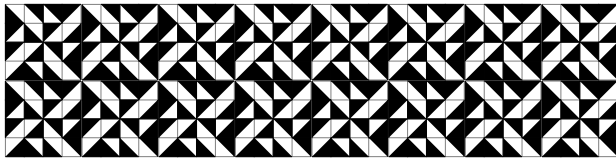
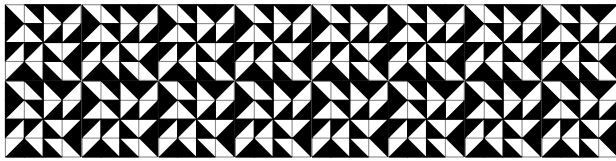


Frieze patterns for family 1100

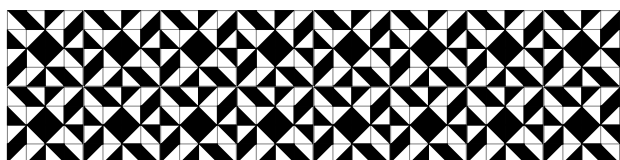
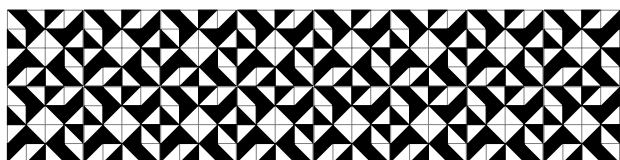
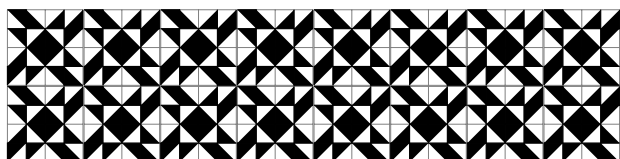
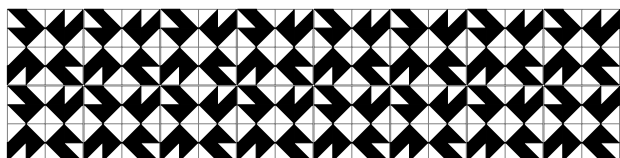
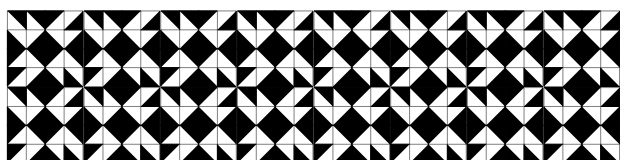
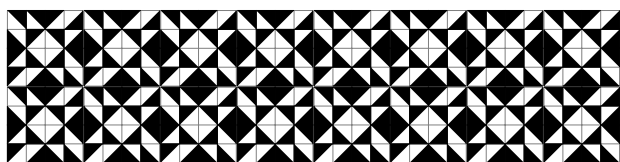
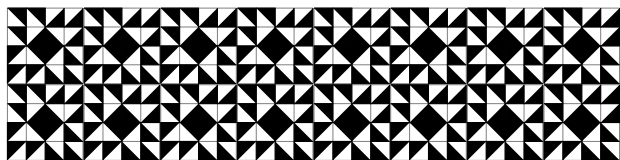
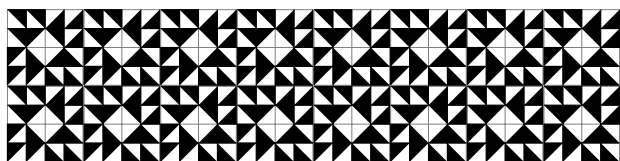


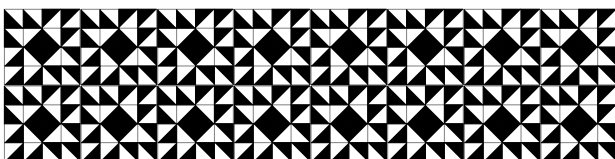
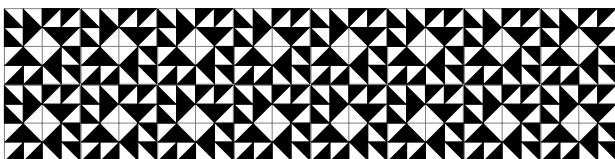
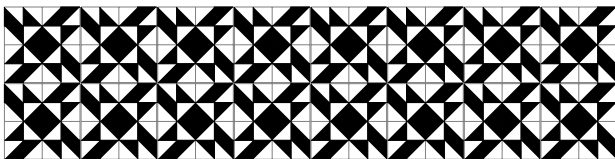
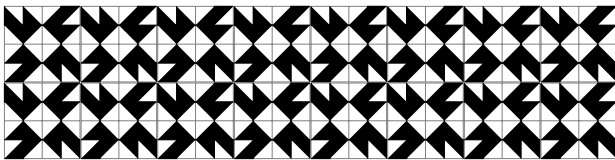
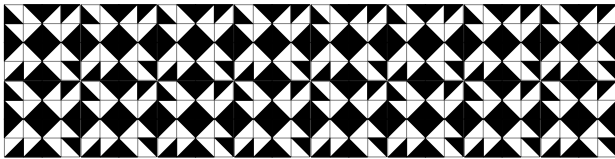
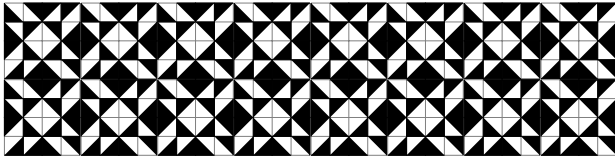
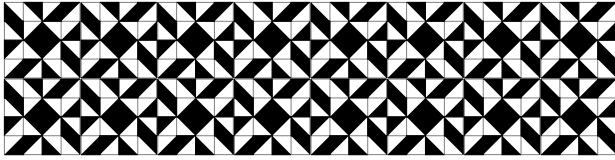
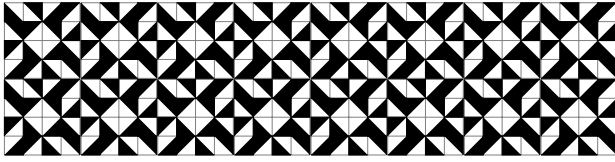
Frieze patterns for family 1101



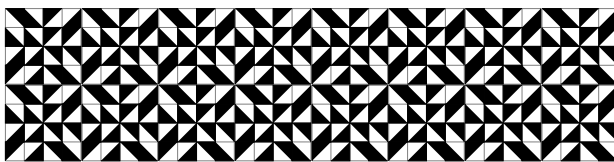
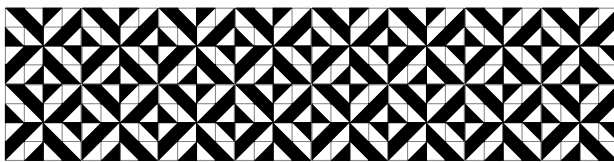
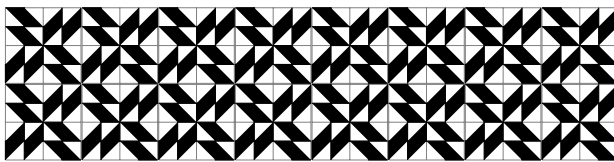
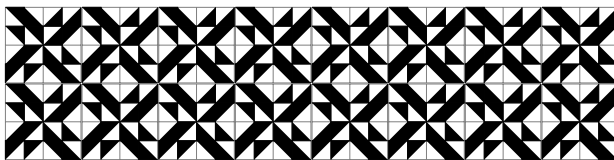
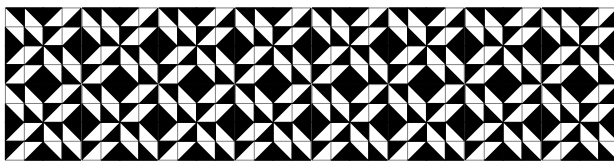
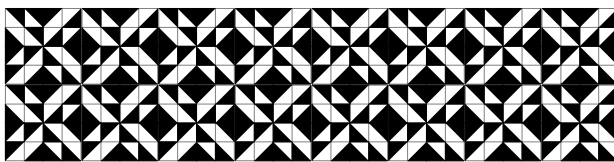
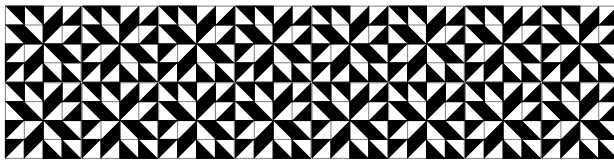
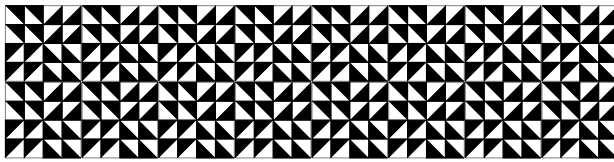


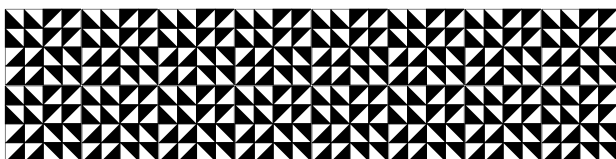
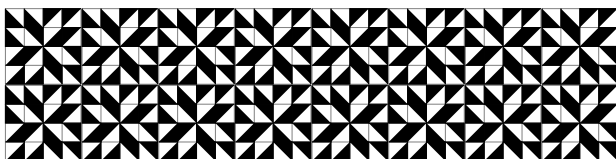
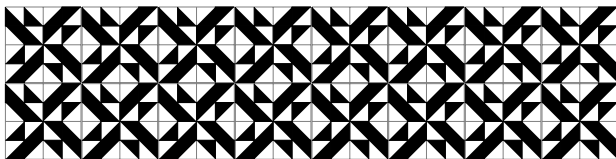
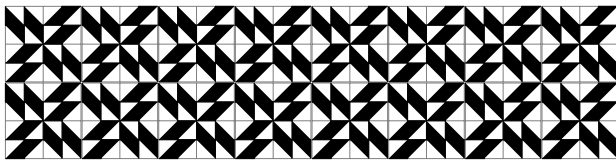
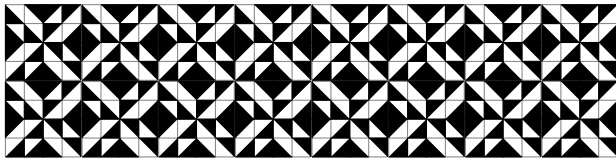
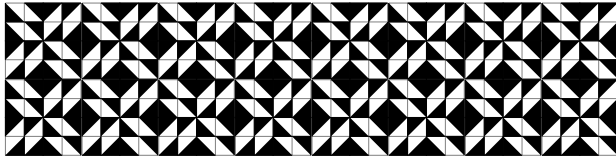
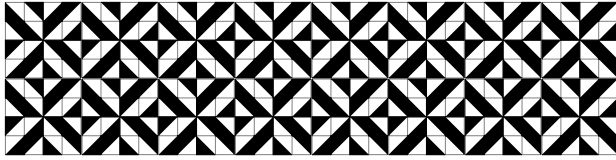
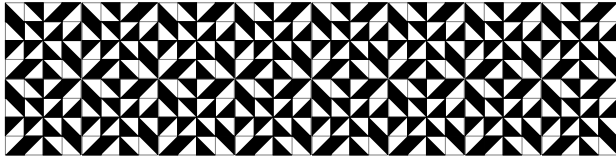
Frieze patterns for family 1110





Frieze patterns for family 1111





Bibliography

J. Truchet and S. Truchet. *Methode pour faire une infinité de desseins differens, avec des carreaux mi-partis de deux couleurs par une ligne diagonale : ou Observations du Pere Dominique Douat... sur un Memoire inseré dans l'Histoire de l'Academie Royale des Sciences de Paris l'année 1704 présenté par... Sebastien Truchet...* Chez Florentin de Laulne, 1722. URL <https://books.google.ca/books?id=pK7-X6u7FCMC>.