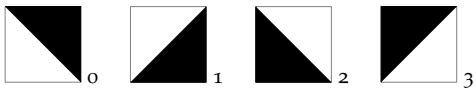
TRUCHET BOOK (I)

4X4 PATTERNS WITH ROTATIONAL SYMMETRY

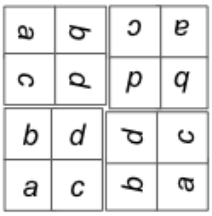
Current printing, January 2025

Introduction

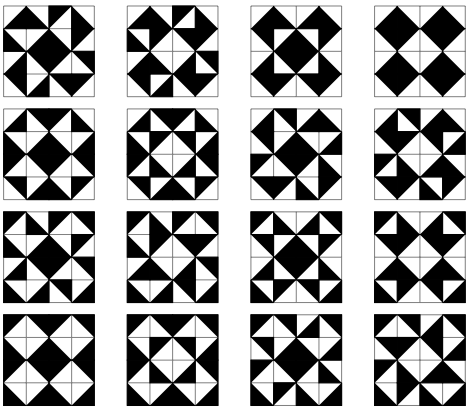
This booklet presents a complete listing of 4*x*4 Truchet tile patterns with rotational symmetry. Truchet tiles are, traditionally, square tiles that are divided by a diagonal line, and coloured with two colours, one on either side of the diagonal. Each tile can be rotated to one of four positions.



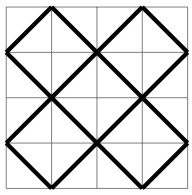
Each 4*x*4 Truchet tile pattern with rotational symmetry has a core 2*x*2 pattern in one of its quadrants that is rotated to produce the overall pattern. In this booklet, the core pattern is assumed to be in the lower left. Each pattern can identified as a sequence of 4 digits *abcd* that list the rotational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



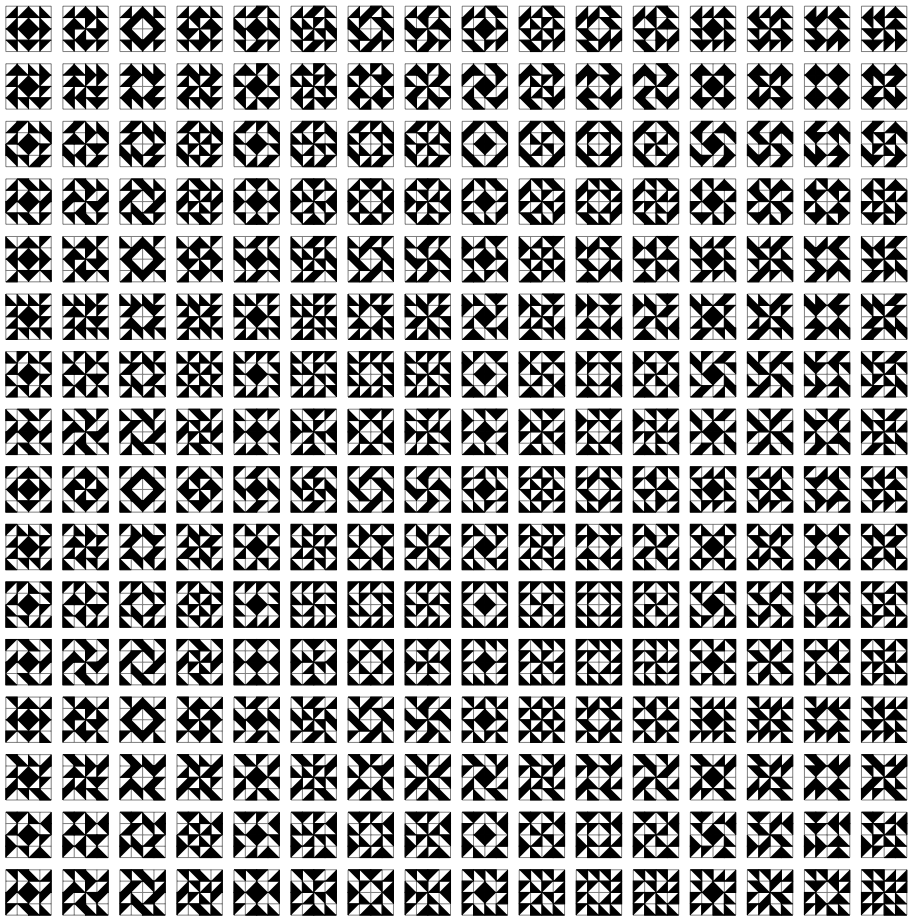
We can group these tile patterns into families where Truchet tile patterns are considered to be in the same family if they would look the same without colour – if each corresponding tile shares the same diagonal direction. The sequence that represents the family of a tile pattern can be found by taking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



The 0110 pattern family



The 0110 family pattern



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.