SHW1: ROUTING VS. TILING

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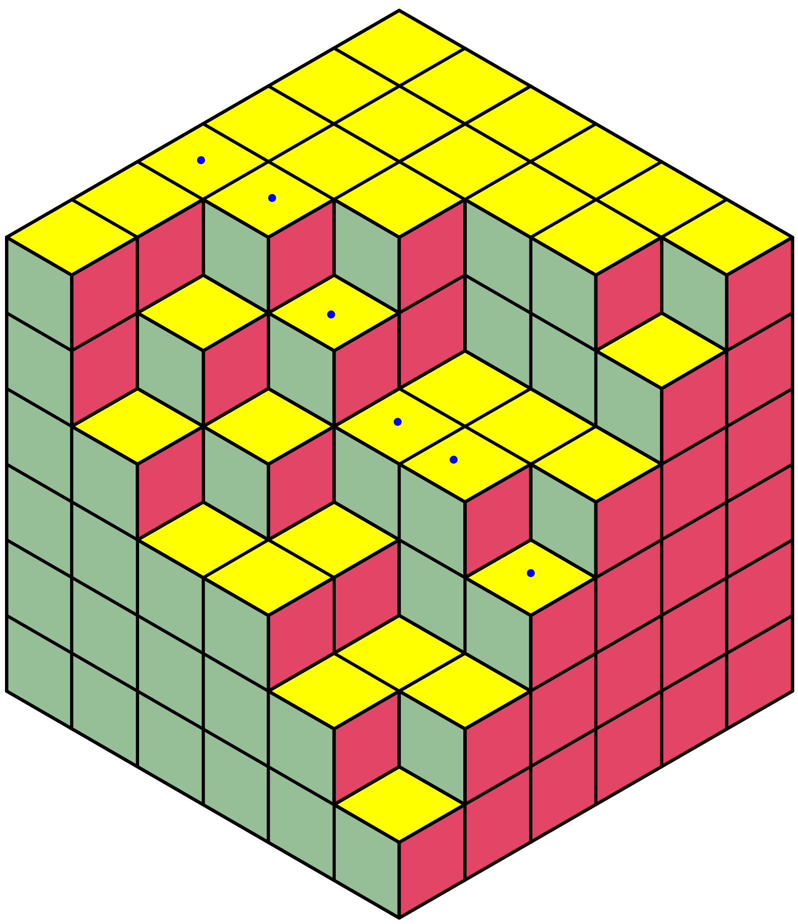
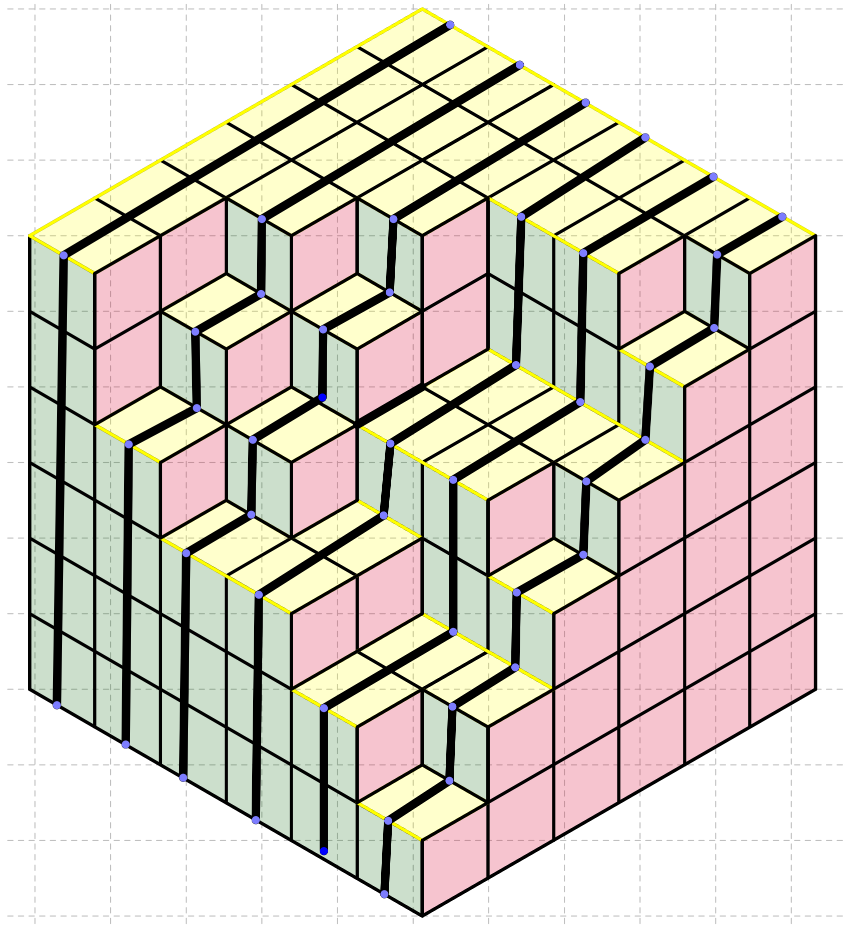
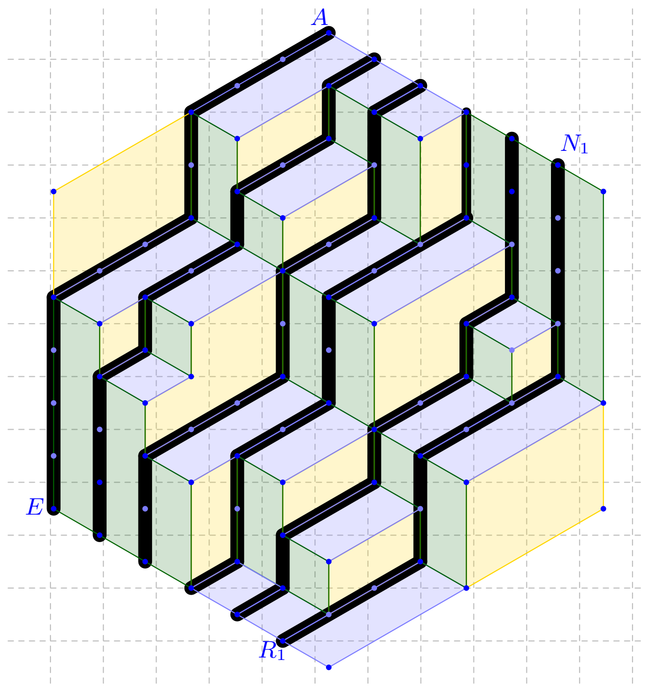
1. Non-obvious tiling: The eleven partitions of 6.



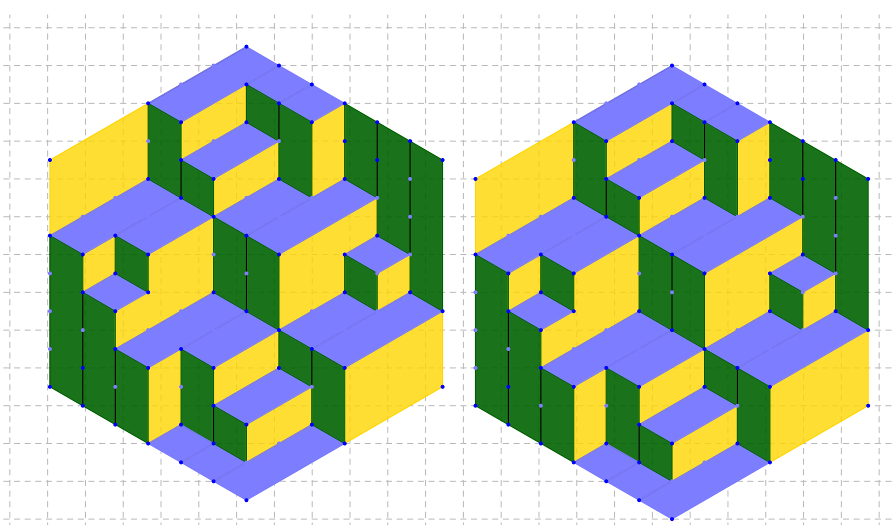
This tiling contains the eleven partitions of six through all the rows and columns of its projections. For example, the partition $2+1+2+1$ appears in one of the rows of its xy projection (marked with blue points).



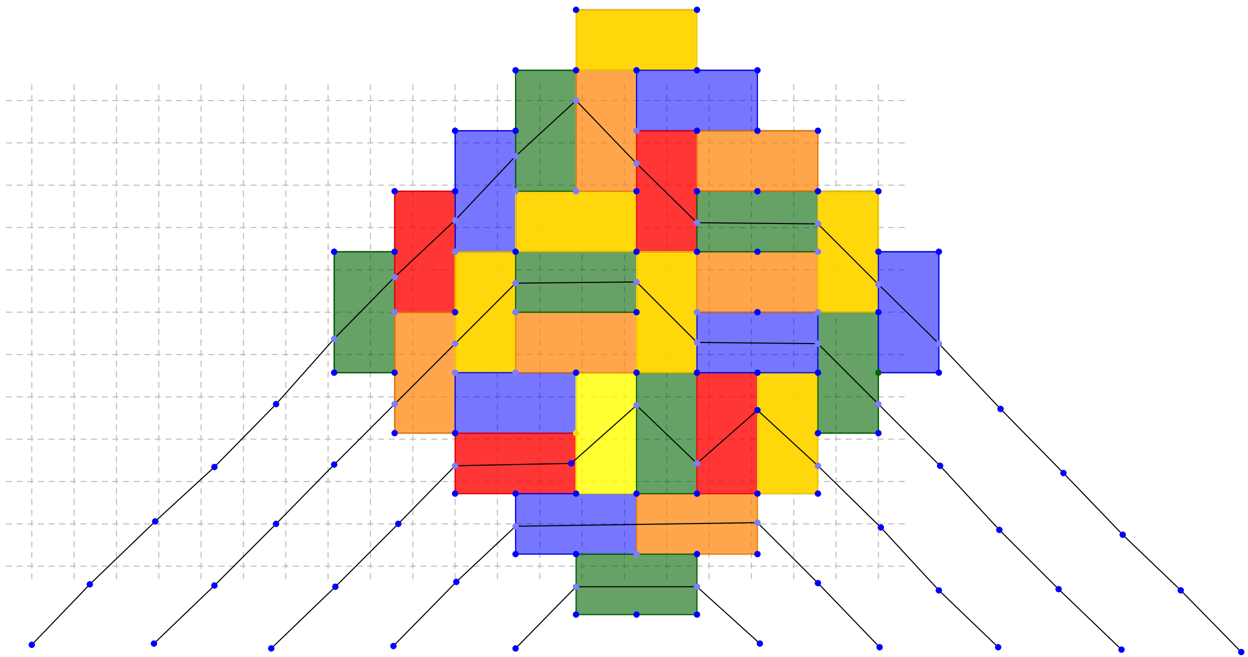
2. Non-obvious routing: Creating self-complementary rhombus tilings using route-reflection.



The route $A \to E$ can be decoded as $LLLDDLLLDDDD$ (lefts & downs), its reflected route will be coded as $DDDDLLLDDLLL$ and it is shown in the route $N_1 \to R_1$. In this example we see the routing generates a self-complementary solid, this means that we can glue two copies of the associated tiling to generate a cube without holes.

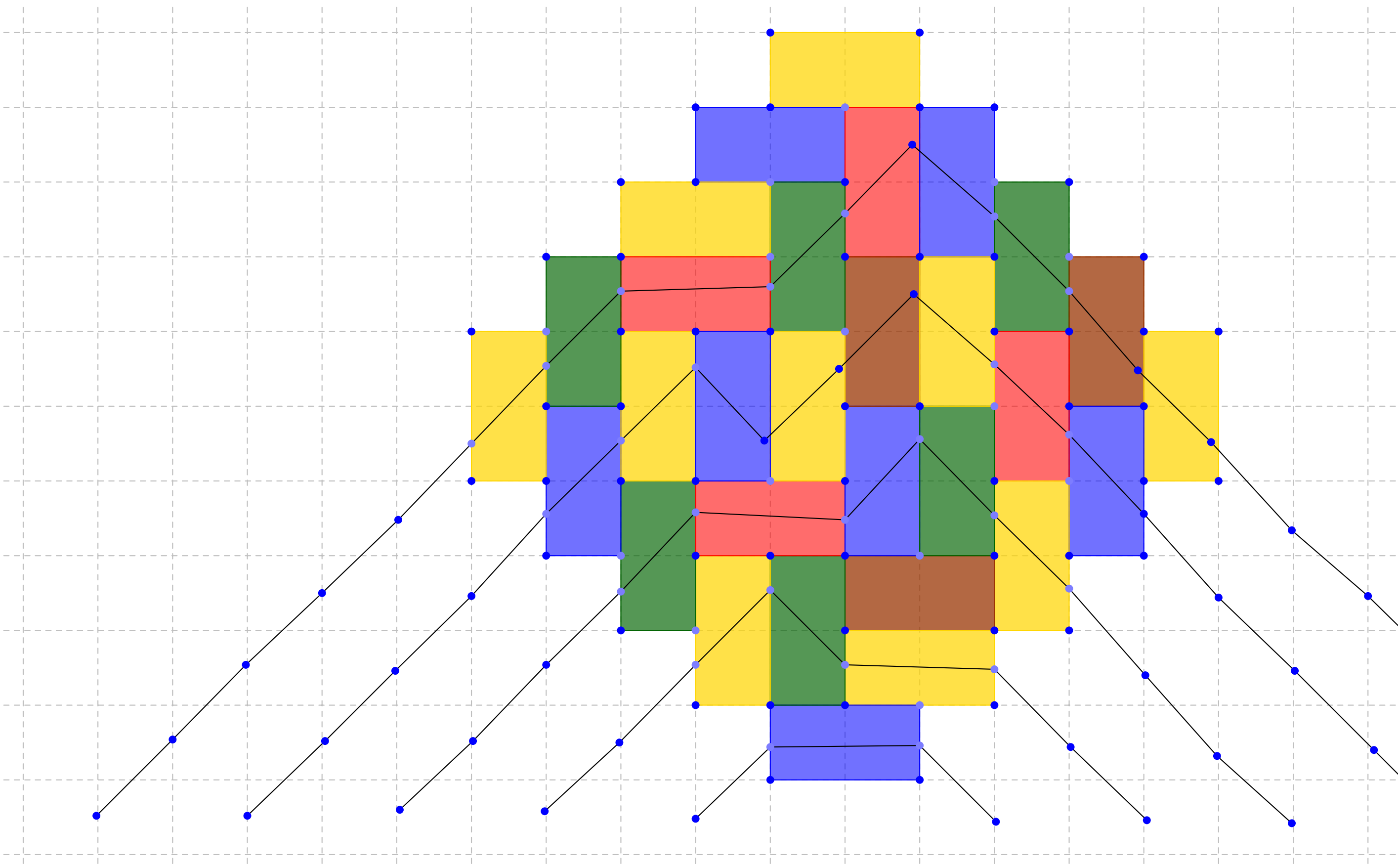


3. Non-obvious Mayan Tiling: Trying to construct a non-symmetric Mayan tiling



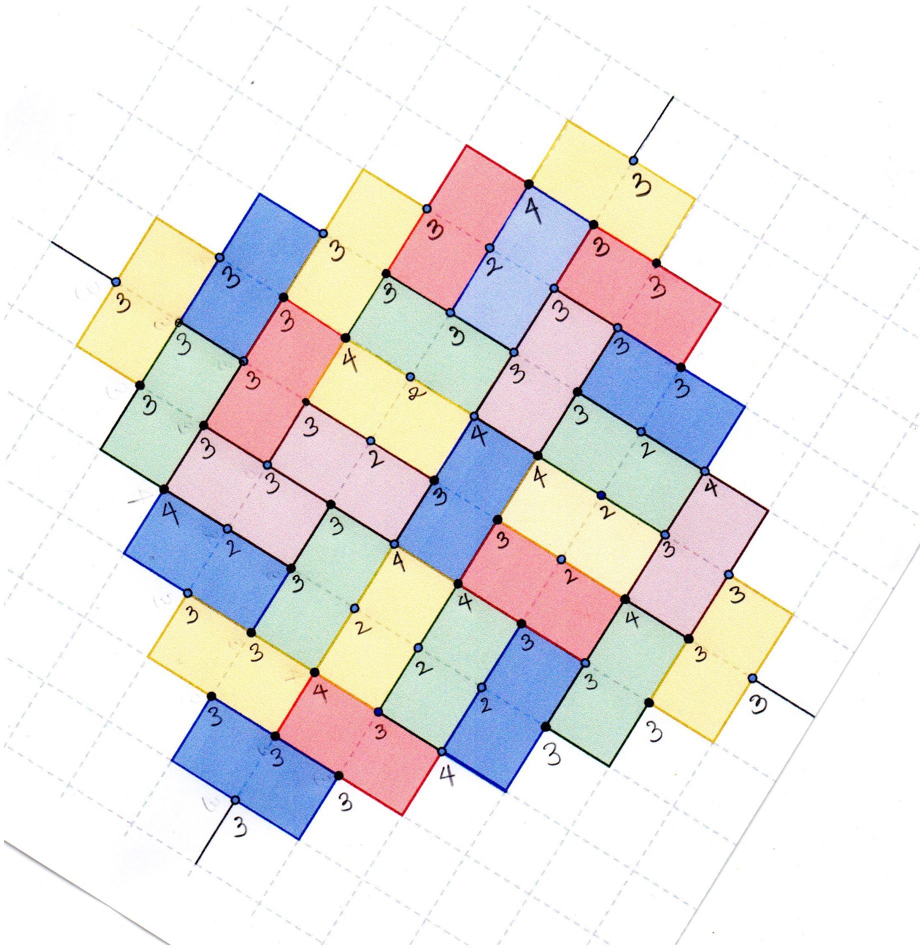
It is not too easy to construct a non symmetric mayan tiling from the tiling itself and this was constructed in this way.

4. Non-obvious routing: Trying to construct a non-symmetric Mayan tiling using routings.



This time we first constructed a non-symmetric routing to find a non-symmetric tiling.

5. Sign Matrices and square ice configurations.



Using the method we saw in the lecture we can prove the sign matrix associated for the tiling is

$$\begin{pmatrix} 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & -1 & 1 \\ 0 & 1 & -1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \end{pmatrix}$$

with square ice configuration