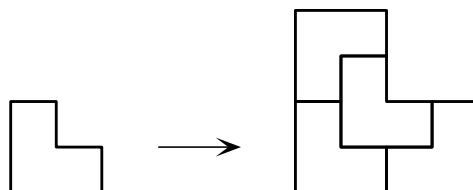


# 2018 LTCC Course on **Aperiodic Order**

## **Worksheet 3**

The chair tiling consists of a single tile which occurs in four different orientations. The inflation rule for one orientation is



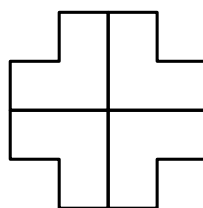
and the rules for the other three orientations are obtained by rotating both sides.

**Exercise 1:** Sketch the inflation rules for the remaining three orientations.

**Exercise 2:** Considering the four rotated versions as separate tiles, write down the corresponding inflation matrix. If you start from a single tile in one orientation, how many tiles do you get after 8 inflation steps in the four different orientations?

**Exercise 3:** Find the leading eigenvalue and the corresponding left and right eigenvector of the inflation matrix. Verify that all orientations occur equally often in an infinite fixed point tiling.

**Exercise 4:** Show that the symmetric patch



is legal for the chair inflation rule.

**Exercise 5:** Argue that inflation of the symmetric patch above leads to a fixed point tiling with individual fourfold symmetry.