## 1. Plain TEXnology

Creating all possible permutations. TAoCP\*1.2.5. Two methods are given. Numbers of permutation are evaluated.

First, the group's binary operation is named *composition*. Given two elements  $\pi, \eta \in Rubik$ , then  $\pi \circ \eta \in Rubik$ .

$$\pi = (a_1 a_2 ... a_n)$$
, and  $\eta = (b_1 b_2 ... b_n)$ , then  $\pi \circ \eta \in Rubik$  and  $\eta \circ \pi \in Rubik$ .

Permutations 1

<sup>\*</sup> https://www-cs-faculty.stanford.edu/%7Eknuth/taocp.html