

Chapter 2.4 Permutations of Multisets

Let S be a multiset of k kinds of elements, each has its own multiplicity. Say $S = \{2 \cdot a, 2 \cdot b\}$. The all 3-permutations of S are $aab, aba, baa, bba, bab, abb$.

- 1: Let $S = \{\infty \cdot a, \infty \cdot b, \infty \cdot c\}$. What is the number of r -permutations of S ?

- 2: Let $S = \{5 \cdot a, 5 \cdot b, 5 \cdot c\}$. What is the number of permutations of S ? (That means 15-permutations)

3: What is the number of permutations of a multiset $\{I, L, L, I, N, O, I, S\}$?

4: Let S be a multiset of k different object of multiplicities n_1, n_2, \dots, n_k , where $n = n_1 + n_2 + \dots + n_k$. What is the number of permutations of S ?

5: How many ways is it possible to place 8 white non-attacking rooks on 8×8 chess board? (Recall that rook can move only horizontally or vertically, but it can move any number of squares)

6: How many ways is it possible to place 8 non-attacking rooks on 8×8 chess board if 4 rooks are white and 4 rooks are black?