Lab: Combinatorial Algorithms

This document defines the **in-class exercises** (lab) for the "Algortihms" course @ Software University.

Part I - Permutations

1. Permutations without Repetitions

Given a set of elements, find all permutations without repetitions.

Examples

Input	Output
A B C	A B C A C B B A C B C A C B A C A B

2. Permutations with Repetitions

Given a multi-set of elements, find all permutations.

Examples

Input	Output
A B B	A B B B A B B B A

Part II - Variations

3. Variations without Repetitions

Given a set of elements, find all variations of k elements without repetitions.

Examples

Input	Output
A B C 2	A B A C B A B C C A C B

4. Variations with Repetition

Given a set of elements, find all variations of k elements with repetitions.

Examples

Input	Output
A B C 2	A A A B A C B A B B B C C A C B C C

Part III - Combinations

5. Combinations without Repetition

Given a set of elements, generate all combinations of k elements without repetition.

Examples

Input	Output
A B C 2	A B A C B C

6. Combinations with Repetition

Given a set of elements, generate all combinations of k elements with repetition.

Examples

Input	Output
A B C 2	A A A B A C B B B C C C

Part IV - Binomial Coefficients

7. N Choose K Count

Given a **n** and **k**, calculate the number of possible **n choose k** combinations (without repetition).

Examples

Input	Output
3 2	3

49 6	13983816