

# Lab: Combinatorial Problems

This document defines the lab for the "[Algorithms – Fundamentals \(C#\)](#)" course @ Software University.

Please submit your solutions (source code) to all below-described problems in [Judge](#).

## 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
A B	A B B A

## 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

## 3. Variations without Repetitions

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

### Examples

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

## 5. Combinations without Repetition

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

### Examples

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

	A C
	B B
	B C
	C C

## 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	3
2	
5	10
3	