## Шайма бидан ALGORITHMS FUNDAMENTALS THEORY

КН 220 i.в

### **Laboratory Training 6**

*FUNDAMENTAL ALGORITHMS ON GRAPHS AND TREES*

**Objective:**

Explore ways of representing graphs and gain skills of programming algorithms that process them.

**Task**:

Develop a program that reads from the keyboard numbers N, M (1 <N, M <256) being numbers of vertices and edges of the graph, a sequence of M integer pairs being the edges. The program saves the graph and performs on it an algorithm

**Variant 5:** (*1.5*)

Adjacency matrix.

Construct a spanning tree with Prim's algorithm.

*Adjacency matrix:*

In graph theory and computer science, an adjacency matrix is a square matrix used to represent a finite graph. The elements of the matrix indicate whether pairs of vertices are adjacent or not in the graph. In the special case of a finite simple graph, the adjacency matrix is a-matrix with zeros on its diagonal.

*Spanning tree with Prim's algorithm:*

In computer science, Prim's algorithm is a greedy algorithm that finds a minimum spanning tree for a weighted undirected graph. This means it finds a subset of the edges that forms a tree that includes every vertex, where the total weight of all the edges in the tree is minimized.

Suggested Code for this lab: