1. Find examples of two graphs that:

   (a) are Hamiltonian and Eulerian

   (b) are Hamiltonian but not Eulerian

   (c) are Eulerian but not Hamiltonian

2. Give a necessary and sufficient condition for $K_{m,n}$ being Eulerian. What about hamiltonicity?

3. Is there an Eulerian graph with even number of vertices and odd number of edges?

4. In the Petersen graph find a spanning tree using DFS and BFS. In both cases label the vertices and find Prüfer code.

5. Find a tree with Prüfer code: **a)** (1,1,5,5); **b)** (1,3,5,1,2); **c)** (3,2,1,2,3,4)

6. For the weighted graphs apply Dijkstra's algorithm (a root is the vertex 1) and find minimal spanning tree (by Kruskal's algorithm and Prim's algorithm).