Abstract: It's possible to simulate a lot of real decision-making situations by a weighted graph. Consequently it's important to find the optimal solution of a given situation based on this model. The subject of this Bachelor Thesis is to present the typical problems of combinatorial optimization, that deal with finding the optimal path in a graph considering the given conditions, and algorithms to find their optimal solution. It's focused on following problems: the shortest path problem, the minimum cost spanning-tree problem, the minimum cost Steiner tree problem, the travelling salesman problem and the optimal network flow. Working of some algorithms is shown on illustrative examples.