

The presented thesis discusses bilevel programming problems with the focus on solution algorithms. Bilevel programming problem is a hierarchical programming problem, where constraints contain another programming problem.

We formulate basic bilevel optimization theory and describe three types of solution algorithms for bilevel programming problems: Algorithms based on KKT reformulation where the lower level is replaced by its KKT conditions, algorithms based on optimal value function where the bilevel programming problem is reduced to a single level problem using the optimal value function of the lower level problem, and algorithms solving linear bilevel programming problems.

Using real data for portfolio optimization bilevel programming problems, we compare ability to solve the problems and computing time of some of the presented algorithms.