The Bachelor thesis is dealing with Benders decomposition in optimization, especially in stochastic linear programming. In the begining the reader will be introduced to the important terms used in the decomposition algorithm. Consequently it is demonstrated how to reformulate the problem of stochastic linear programming to a special structure suitable for Benders decomposition. In the third chapter, the decomposition algorithm, using the feasibility and optimality cuts, is explained including conditions of convergence of the algorithm. There follows modification of algorithm for two stage stochastic linear programming. Finally, we illustrate Benders algorithm on two smaller problems.