

The aim of this Bachelor's thesis is to introduce the basic concepts of regression analysis and subsequently regression splines as parametric models for regression function. I have looked upon the main characteristics of regression splines (coherence, coherence of derivations, the choice of placement and a number of knots). Further on in the thesis I have studied two bases as the examples of regression splines (truncated power basis and B-spline basis). I have also presented a model of natural cubic splines and a suitable basis for its representation has been derived. In the other part of my thesis I have looked upon the use of natural splines in order to increase the appraisal precision of regression function, mean square error formula has been derived and I have been trying to find out and illustrate under what conditions the use of natural splines is applicable. The thesis is complemented with a Monte Carlo Simulation, contextualized into models of splines. The results show that the criteria commonly used for the choice of a model (R_{adj}^2 , PRESS statistic, hypothesis testing) do not always enable us to choose the right model in order to achieve the greatest precision of the estimation of regression function. All the calculations are done in R software and are in the electronic attachment.