

Prediction of graduation success and time to exam

A statistical analysis of the natural science bachelor's programs at Stockholm University

Hiam Shaba*

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Abstract

The aim of this thesis is to investigate which factors that have an impact on the probability to graduate and the time it takes to graduate at natural science bachelor's programs, given that the programs begin with the same basic course in mathematics, Mathematics I, at Stockholm University. The factors used are the time to finish their first course in mathematics and the grade in the course, the gender, the age of the student when starting the education and which bachelor's program the student is enrolled in. Students not following a program are also included in the model predicting the time to exam. The sample data consist of undergraduate students that were registered in the course Mathematics I from 2007 until January 2019. A model for the prediction of graduation success is computed with a binomial logistic regression model, where we investigate whether students obtain a bachelor degree within six years, using a data sample from year 2007 until 2012. The results of the analysis is that the time to finish Mathematics I, the bachelor's program, the grade in Mathematics I and the student's age when starting the education, are associated with the probability to graduate. Though, when visualizing the performance of the model the AUC-value indicate bad predictability. The 'time to degree'-model implements a gamma generalized linear model with a data sample of students that have completed their thesis given that they have completed Mathematics I, from year 2007 until 2017. In this model we include students taking stand-alone courses. The analysis of the time it takes to obtain a degree resulted in two gamma generalized linear models with an identity and logarithmic link function, and the time to finish Mathematics I as a significant explanatory variable.

*Postal address: Mathematical Statistics, Stockholm University, SE-106 91, Sweden.
E-mail: hish0194@student.su.se. Supervisor: Tom Britton, Martin Sköld.