**Master’s Project Presentation**  
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Title: *Application of Bayesian Logistic Regression in Predicting Bank Loan Acceptance Rate*

Abstract

Bank loan acceptance rate is an important measure for profit earning for a bank. The goal of the project is to predict the probabilities of accepting a bank loan by the customers using their personal banking data. These acceptance probabilities can be used by the bank to offer the loan to a specific customer group so that the loan acceptance rate is increased. Bayesian logistic regression is used to model the loan acceptance probability using some important predictors such as customer’s age, professional experience, annual income, average spending on credit cards, education level and whether customer have certificate of deposit account. An empirical Bayes approach is used where the prior distribution for the unknown parameters are constructed from the maximum likelihood estimate of a classical logistic regression model. The posterior distribution of the unknown parameters is intractable, so the Metropolis Hasting MCMC method is used to sample from the posterior. The posterior predictive distribution is used to predict the bank acceptance rate in a set aside validation data set. The truth table shows the Bayesian logistic regression can predict the loan acceptance rate accurately. The Bayesian approach also allows us to quantify the uncertainties in the prediction.