Homework Assignment 06:

STAT 52900	**Presentation Code:** A2
Name: *Sai Thanish Voore*	**Title:** *Bayesian Disease Risk Estimation*
	Abstract: The purpose of this notebook is to introduce a Bayesian generalized linear model approach aiming at *i)* predicting heart failure risk and *ii)* understanding which factors contribute the most, using the Heart Failure Prediction dataset. My choice for a backend framework in this analysis was PyMC. Drawing inspiration from the Bayesian Methods for Hackers and Statistical Rethinking, this project aims to showcase the practical and theoretical aspects of Bayesian modeling. We will fit a generalized linear model using all features, quantitative and binary alike, to predict the probability of the target variable. We can set up the optimization procedure using MCMC. will choose the Hamiltonian method with maximum a posteriori (MAP) estimation for starting values. The beauty of the Bayesian framework is found in how uncertainty seamlessly propagates throughout the model. By presenting a practical use-case, this project encourages the consideration of Bayesian inference in addressing small-scale modeling problems. The insights gained from this analysis not only contribute to the understanding of heart failure risk prediction but also serve as a steppingstone for broader applications of Bayesian methodologies in similar contexts.

August 1, 2023