# Quiz 3. AMS 597

# Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_SBU ID:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# The quiz is due at the end of the lecture by 11:20am. Please email your completed quiz to your TA at: [song.jiecheng@stonybrook.edu](mailto:song.jiecheng@stonybrook.edu)

# Please include (1) R code

# (2) Output from R

# (3) Answers to all the questions asked

#### General Linear Model with Galton’s Height Data

The accompanying Excel file contains data based on the famous 1885 study of Sir Francis Galton exploring the relationship between the heights of adult children and the heights of their parents. Each case is an adult child, and the variables are

* Family: The family that the child belongs to, labeled from 1 to 204 and 136A
* Father: The father's height, in inches
* Mother: The mother's height, in inches
* Gender: The gender of the child, male (M) or female (F)
* Height: The height of the child, in inches
* Kids: The number of kids in the family of the child

The data set has 898 cases. (Reference site: <https://www.randomservices.org/random/data/Galton.html>)

1. Please find a model that best predicts the son’s height using suitable variable selection method. Please provide model goodness-of-fit index.

Please perform all model diagnostics necessary.

1. Please find a model that best predicts a child’s height using suitable variable selection method.

That is, this model should be applicable to either son or daughter.

Please provide model goodness-of-fit index.

Please perform all model diagnostics necessary.

1. Please discuss any limitations/imperfections your models might have. How can you improve your models?