ISE 529 Engineering Data Analytics Homework 1 Fall 2017

Due date September 1, 2017 (in class)

Report R commands along with the output unless noted otherwise. Report must be wordprocessed.

1. (20 pts.) Let X be a normal random variable with mean $\mu = -1.25$ and variance $\sigma^2 = 0.36$. Find

   a) $P[X > -1.9\,]$

   b) $x_{0.25}$ (the 25^{th} percentile of X)

2. (40 pts.) Download stock prices from Ford and General Motors from August 25, 2016 to August 25, 2017.

   a) Find the correlation of the adjusted closing daily prices

   b) Find the correlation of the daily returns (based on adj.Closed Prices)

   c) Find kurtosis of GM daily returns

   d) Create a scatter plot of daily returns with a least squares line on it. What is the slope of that line?

3. (40 pts.) The dataframe `VIT2005` in the `PASWR2` package contains descriptive information and the appraised total price (in euros) for apartments in Vitoria, Spain.

   a) How many one-garage apartments have a `totalprice` greater than 400,000 euros?

   b) Build a histogram of relative frequencies of `totalprice`. Add a normal density curve to the plot.

   c) Find the covariance and correlation matrix between all numerical variables (use `str()` to identify which variables are numerical).

   d) Make a scatterplot of `totalprice` and `area`. Report the row number, `totalprice` and `area` of the largest outlier.