# Programming Practices

Instructions: For all the following exercises, use the Credit.csv dataset.

1) Find the expected variance E[$\sigma$^2] of the “Income” distribution of sample means with size=n of those who are “Married”. Plot the graph of n vs $\sigma$.
   Consider n=10, 20 , 30….50.

2) Find the probability distribution of “Cards”. Calculate “mean” and “variance” of “Cards”. Take a random sample of size 45. With a 95% confidence estimate the population mean of the number of cards of a person. Assume population variance is unknown.

3) From the Credit.csv data provided, generate 3 random sample sets without replacement of sizes 200, 250 and 150. Let these samples be named as A, B and C.
   a) Run a one way ANOVA on the income columns of A, B and C to check whether they are from the same population.
   b) Find the grand mean (x) of the incomes from the samples and the total sample variance (s2). Generate 250 normally distributed random incomes (labeled as D) with mean x and variance 3*s2. Run one way ANOVA again on the incomes of A, B, C and D and verify whether they belong to the same population.