Tutorial 3

1. Read the data from the file `Colleges.txt`. Consider a simple linear regression of percentage of applicants accepted (`Acceptance`) on the median combined math and verbal SAT score of students (`SAT`), called Model M1.

   (a) Write your own function in R to derive the equation of Model M1.

   (b) Use function `lm()` in R to derive the equation of Model M1. Compare with your answer in part (a).

2. Consider the question given in Tutorial 1.

   (a) For the first question in Tutorial 1, use the code to define a function, called F1, where the argument of F1 is **salary**. Run function F1 for the two cases mentioned.

   (b) For the second question in Tutorial 1, use the code to define a function, called F2, where F2 has two arguments: **salary** and **rate**. Run function F2 for the two cases mentioned to obtain the results.

   (c) From question the settings given in Tutorial 1, we know that both the percentage of your salary that you save each month and the rate of raising salary every 4 months affects how long it takes you to save for a down payment.

   Now, suppose the raise in salary every 4 months is fixed at 0.01 and you want to set a particular goal, e.g. to be able to afford the down payment in five years for a house with the price is of your choice, **price**. How much should you save each month instead of 40% to achieve the goal? In this problem, you are going to write a function, called F3, which helps to answer that question.

   You are now going to find the **best propotion of savings monthly** from your salary to achieve a down payment in five years. Since hitting this exactly is a challenge, we simply want your total savings to be at least as the same as the required down payment. The proportion of saving should be of 2 decimal places.

   Run function F3 and report the answers obtained for two cases: (**salary** = \$7,000 and **price** = \$1,200,000) and (**salary** = \$4,000, **price** = \$800,000).