# Instructions

The file “banks.csv” includes data on a sample of 20 banks. The “Financial Condition” column records the judgment of an expert on the financial condition of each bank. This outcome variable takes one of two possible values-weak (coded as 1) or strong (coded as 0)-according to the financial condition of the bank.

The predictors are two ratios used in the financial analysis of banks: TotLns&Lses/Assets is the ratio of total loans and leases to total assets and TotExp/Assets is the ratio of total expenses to total assets.

The target is to use the two ratios for classifying the financial condition of a new bank.

Open your “banks.R” file in R Studio,

1. Change the working directory use *Session -> Set Working Directory -> To Source File Location* from the Menu Bar.
2. Use the read.csv command to import the dataset “banks.csv”.
3. Run the logistic regression model on the entire dataset (no training/validation setup) using glm() to predict the financial condition with the two predictor variables. (8 points)
4. Display the results use summary() function. (3 points)
5. Using the regression outcome, write the estimated equation that associates the financial condition of a bank with its two predictors in three formats:

i. The logit as a function of the predictors (3 points)

ii. The odds as a function of the predictors (3 points)

iii. The probability as a function of the predictors (3 points)

1. Use predict() function to get the predicted probabilities for the data set. (6 points)
2. Consider a new bank whose total loans and leases/assets ratio = 0.6 and total expenses/assets ratio = 0.11. From your logistic regression model, estimate the following four quantities for this bank (use R to do all the intermediate calculations; show your final answers to four decimal places): the logit, the odds, the probability of being financially weak, and the classification of the bank (use cutoff = 0.5) (12 points)
3. The cutoff value of 0.5 is the probability of being financially weak. Compute the corresponding odds and logit of being financially weak. (6 points)
4. Interpret the estimated coefficient for the total loans & leases to total assets ratio (TotLns&Lses/Assets) in terms of the odds of being financially weak: Given everything else the same, a 0.1 unit increase in the ratio, how will the odds change? (6 points)