**SDM Assignment 3**

Financial analysts specializing in credit markets are often interested in predicting whether a firm will go bankrupt within a fixed period of time, such as one year. If there is good chance that a particular firm may go bankrupt, then that firm will have to pay a very high interest rate on any debt (bonds) purchase.

In practice, statistical models to predict bankruptcy are quite difficult to construct. One variable that is frequently associated with firm bankruptcy versus firm solvency is return on assets (ROA). The accompanying file Bankruptcy.csv (posted on Canvas) contains financial data on 46 firms. Of these 46 firms, 21 firms went bankrupt within one year after the data was collected; the other 25 firms remained solvent after one year.

* 1. Construct a 95% confidence interval for the average ROA. Based on this confidence interval, what is the maximum ROA that a firm can expect with 95% confidence. Write the R code that you used to arrive at this answer.
  2. Is ROA statistically different for solvent versus bankrupt firms? If so, which set of firms have higher ROA? To answer these questions, split the data into two subsets for solvent and bankrupt firms. Construct two 95% confidence intervals**,** one for solvent and one for bankrupt firms. Based on these two confidence intervals, is it likely that the average ROA of solvent firms is the same as that of bankrupt firms? Write the R code that you used to derive this inference.