2.

A. It is a regression problem, and we are interested in prediction. The data is mostly quantitative as well as the fact that the question posed want to know which factors effect CEO salary.

N = 500 and P = 4

B. It is a classification problem, and we are interested in inference. We care about “binning” the product as a either a success or failure. N = 20 and P = 14

C. It is a regression problem, and we are interested in prediction not inference. The question posed wants to use quantitative financial data to attempt to predict the future. N = 52 and P = 4

5. A more flexible approach is good in circumstances where prediction is valued more than inference. For example, predicting stock prices to make money is a situation where it doesn’t matter exactly what is driving prices up but just being able to predict that is important. However, an overly flexible model would be susceptible to overfitting and be worthless when used on test data. A less flexible model would be good when the problem leans towards some combination of classification and inference. This is since it is easier to interpret something like linear regression compared to spline fit. A situation where less flexibility might be useful in a situation where the relationship is more linear such as ice cream sales and weather since ice cream sales go up during the hotter months.

6. The difference between a parametric approach and non-parametric is that a non-parametric model tries to approximate hidden function F by getting as close to all points in the training data without getting too rough. It also does not assume the form of the function. A parametric approach assumes a linear model and attempts to approximate the parameters. The advantages are situations where the hidden function f is most likely close to a linear function since a parametric approach would be fairly accurate. If the hidden function f is far from linear than a parametric would not be good to use. Also, in situations where the number of observations is lower is better for a parametric approach since it requires fewer observations.