Spring 2021 **Firstname M. Lastname**

University of Central Florida
College of Business

QMB 6911
Capstone Project in Business Analytics

Solutions: Problem Set #5

0.1 Histogram and Density of Log. Fly Reel Prices

To begin visually analyzing the data, include plots of the density that were created last week.

0.1.1 All Fly Reels Together

Start with the log of prices because prices were skewed. Figure 1 is a histogram of the logarithm of fly reel prices, along with a rug plot and a kernel density estimate. After taking logs, we can see that the distribution is approximately symmetric, now with a slight skew to the left. Unlike the case of the tractors, the improvement from the log transformation is not so clear, so we should investigate this further in a later problem set.

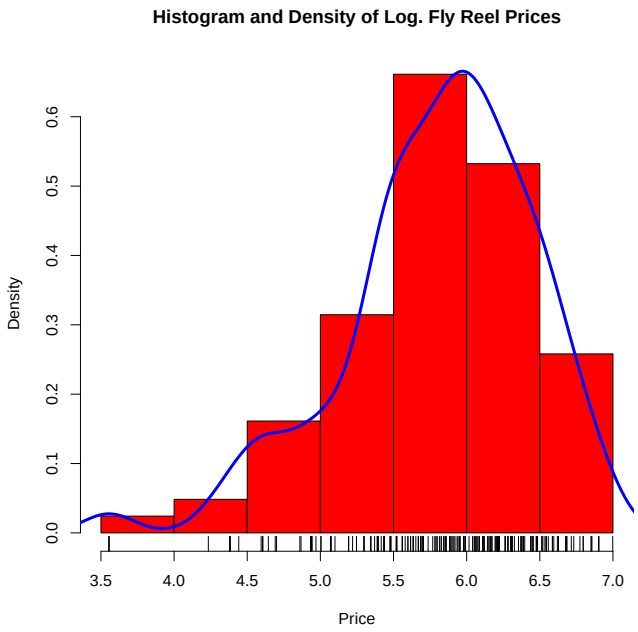

Figure 1: Relative Histogram of Fly Reel Prices

0.1.2 Comparison By Country of Manufacture

Now we investigate the prices of fly reels made in the USA compared to those made in China and Korea. Figure 2 shows the kernel density estimate of the prices of fly reels made in the USA in blue, those made in China in red, and those made in Korea in green. The modes of the distributions are similar, however, we observe more variability in the prices of fly reels made in Korea. The distribution of fly reels made in the USA is shifted toward the higher price range, compared to those made in other countries. This indicates mild support for a "Made in America" premium but we should also consider that it may be explained by the features of the reels made in the USA. We will investigate this further in regression analysis and other modeling approaches.

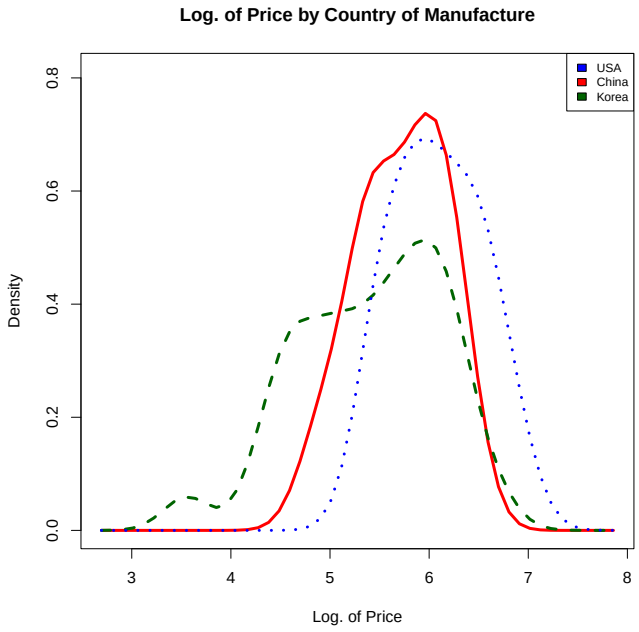

Figure 2: Densities of Log. Fly Reel Prices by Country of Manufacture

Scatterplot Matrices

Scatterplots of Numeric Variables

Figure 3 depicts a matrix of scatterplots of the numeric variables in the dataset.

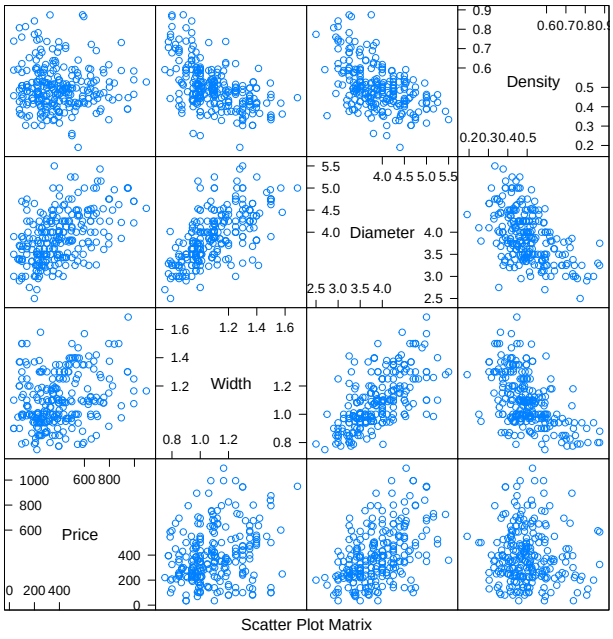

Figure 3: Scatterplots of Numeric Variables

Scatterplots with Categorical Variables

Figure 4 depicts a matrix of scatterplots of with categorical variables in the dataset.

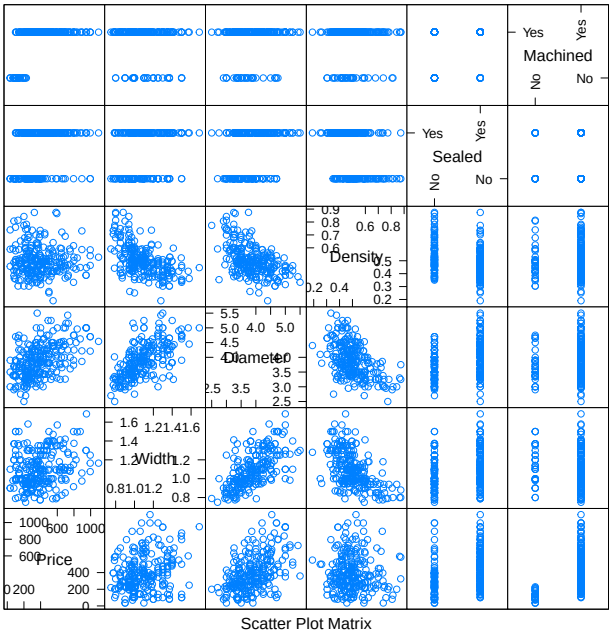

Figure 4: Scatterplots with Categorical Variables

Figure 5 depicts a matrix of scatterplots with a categorical variable for the design combinations of the fly reels: a fly reel is either sealed or unsealed and either machined or cast.

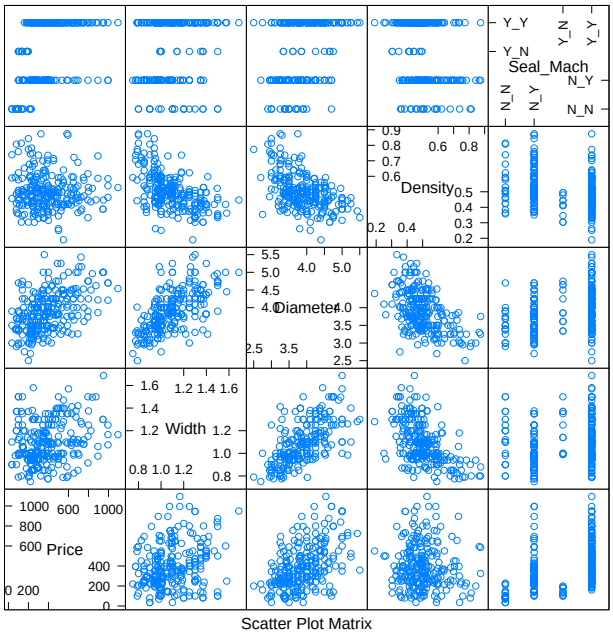

Figure 5: Scatterplots of Numeric Variables

Scatterplots by Country of Manufacture

Figure 6 depicts a matrix of scatterplots of the variables in the dataset with the points indicated differently by country of manufacture.

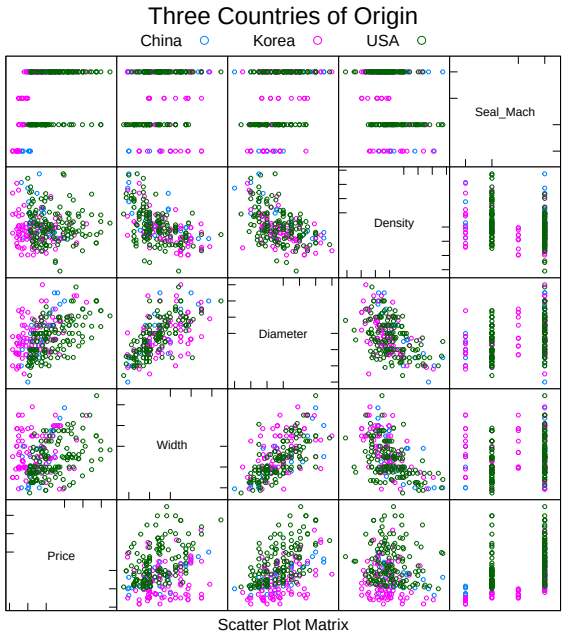

Figure 6: Scatterplots by Country of Manufacture

Dot Chart by Brand and Country of Manufacture

Now consider the average prices by brand of fly reel and country of manufacture. Figure 7 depicts a dot chart showing the average prices in the horizontal axis in these combinations of categories.

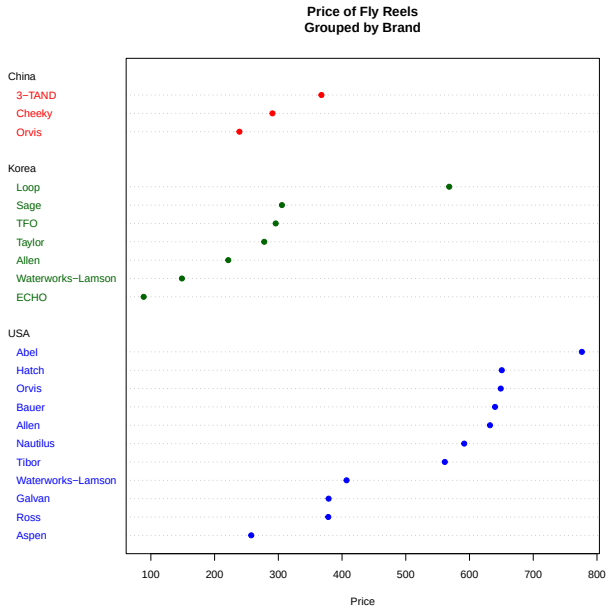

Figure 7: Average Prices by Brand and Country of Manufacture

We see that there exists more variety, in terms of both the number of brands and price levels within the population of American fly reel manufacturers. It's especially important that we consider the proliferation of fly reel brands at the high price points. It is worth investigating further whether those fly reels benefit from the "Made in America" premium or are simply made with more valuable characteristics.