Table 1: Summary of descriptive statistics of the given data.

Variable	N	N*	Mean	SE Mean	StDev	Minimum	Q1	Median	Q3
Turn Diameter	109	0	35.514	0.318	3.321	28.200	32.800	35.400	38.100
Horsepower	109	0	124.67	3.85	40.16	55.00	93.00	114.00	155.00
Number of miles per gallon	109	0	21.486	0.375	3.917	14.000	18.000	21.000	24.000

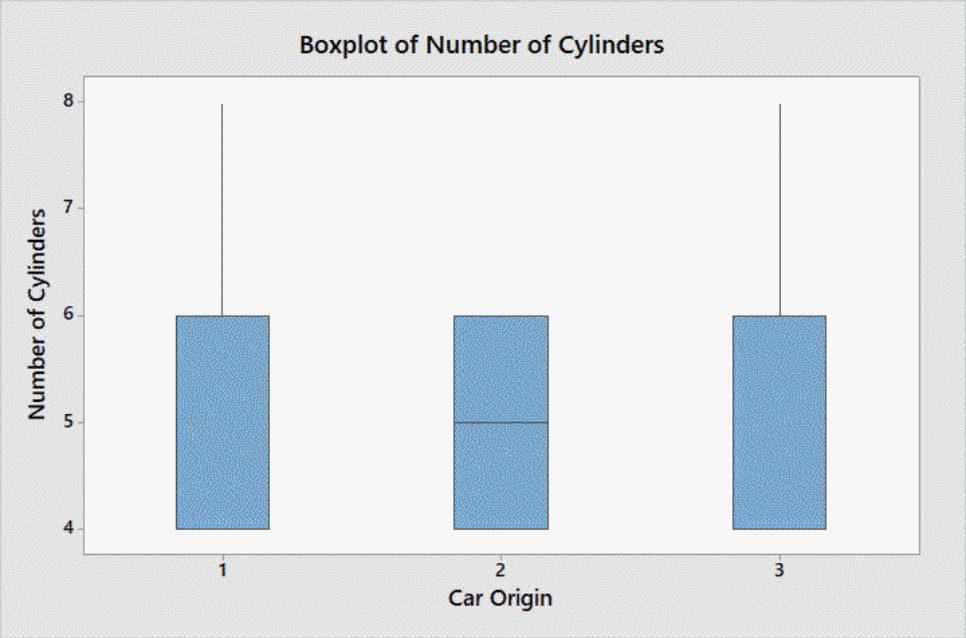

Figure 1

Exam 1: Results and Discussion

Figure 1 shows a boxplot of the number of cylinders produced by each car manufacturer. It shows that Car Origin 1 and 3 manufacture a variety of vehicles having 4– to 8–cylinder engines, while Car Origin 2 only manufactures 4– to 6–cylinder engines. The plot also shows that all three manufacturers tend to favor production of more cars equipped with 4– to 6–cylinder engines.

Figure 2 shows a boxplot of horsepower (HP) vs the car origin. Car Origins 1 and 2 produce vehicles with roughly the same HP range. Among the data, Car Origin 1 has one outlier just below 250 HP. Car Origin 2, while producing similar HP range as Car Origin 1, has a median below that of the latter. Car Origin 3 produces vehicles with a much tighter range and below that of either Car Origin 1 and 2, while having three outliers above the fourth quartile.

Figure 3 shows the miles per gallon (MPG) for each car manufacturer. Car Origin 3 produces vehicles with the best fuel economy, as its median is higher than that of either Car Origin 1 and 2. The latter has a more controlled range of fuel economy but also has the most inefficient. Car Origin 1 sits between the other two and has a range of MPG similar to Car Origin 3.

Figure 4 shows the turn diameters for each car manufacturer. At first glance, the inverse proportionality is evident. Car Origin 1 produces vehicles with the highest turn diameters, but also has the widest range. Car Origin 2 and 3 produce a roughly similar range, with the former sitting between the other two.

Figure 5 shows the HP vs the number of cylinders. As one would expect, more engine cylinders would cause more displacement and subsequently, more horsepower.

Figure 6 shows the MPG for each number of cylinders. A 4–cylinder engine shows moderate fuel economy, while a 6–cylinder setup varies more widely. An 8–cylinder engine tends to be consistent in having the worst fuel economy, with two outliers above the 4th quartile, while still below the median of a 4–cylinder engine. It also has one outlier below the 1st quartile.

Figure 7 shows the relation of turn diameter with the number of cylinders. On initial inspection, it is evident that the turn diameter generally increases with the number of engine cylinders. The 4–cylinder setup has one outlier above the 4th quartile which is higher than the median of the 8–cylinder setup.

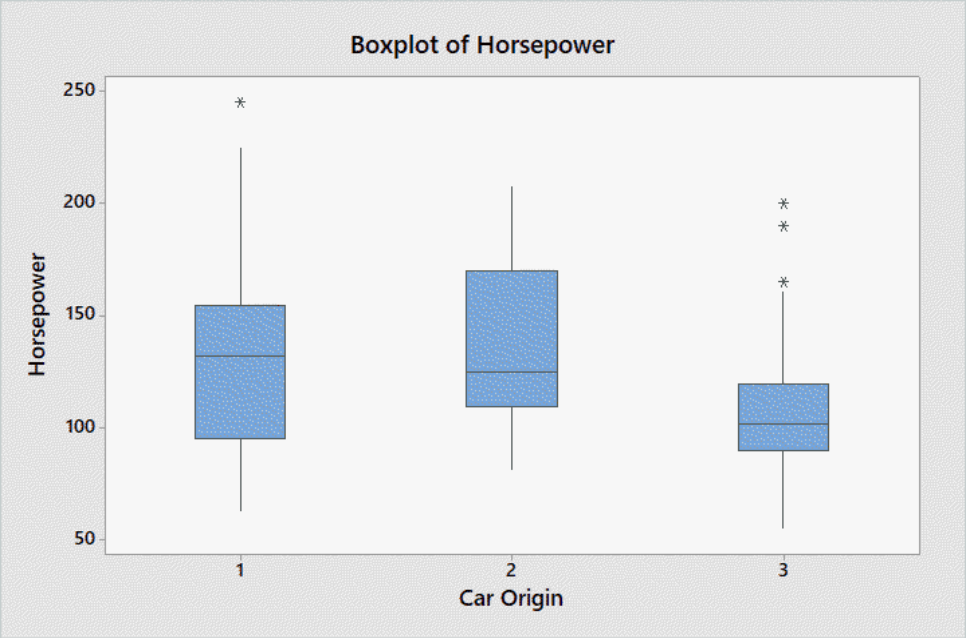

Figure 2

Figure 8 shows a scatter plot of number of MPG vs HP. The regression line has a Pearson correlation of -0.755 and a p-value of < 0.05, indicating strong correlation between MPG and HP.

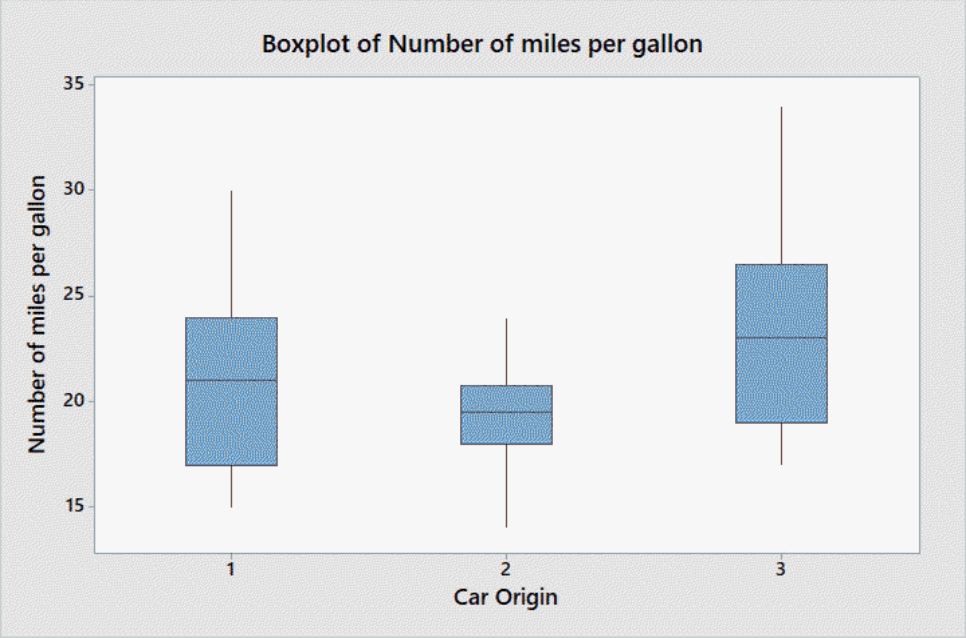

Figure 3

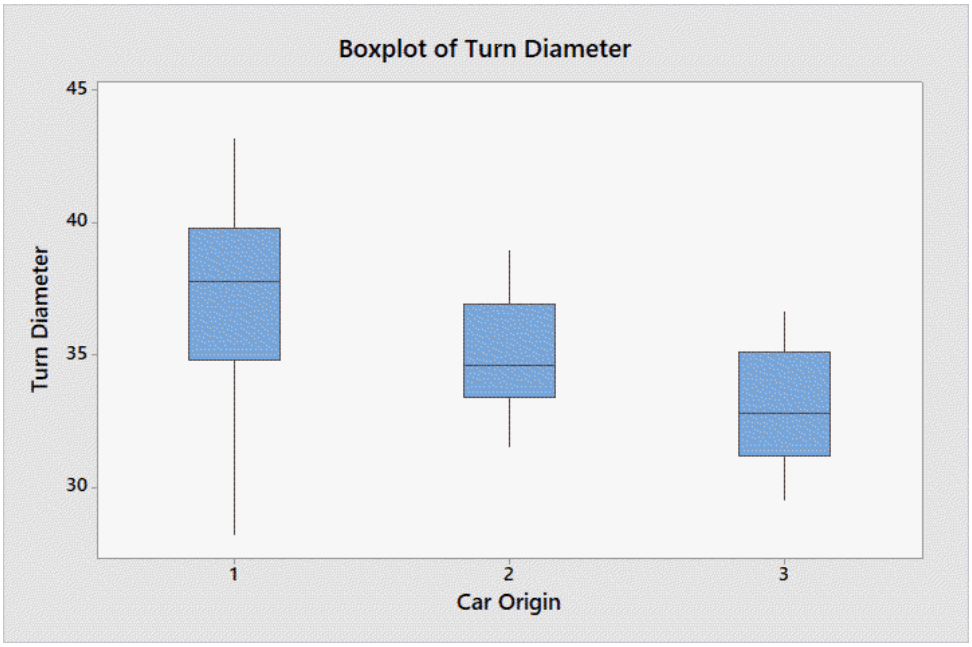

Figure 4

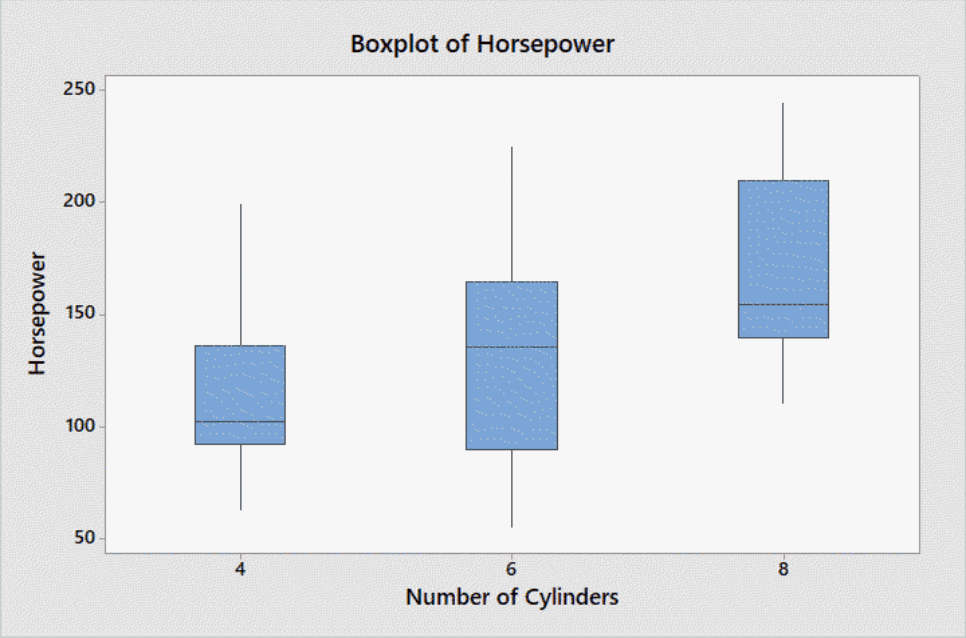

Figure 5

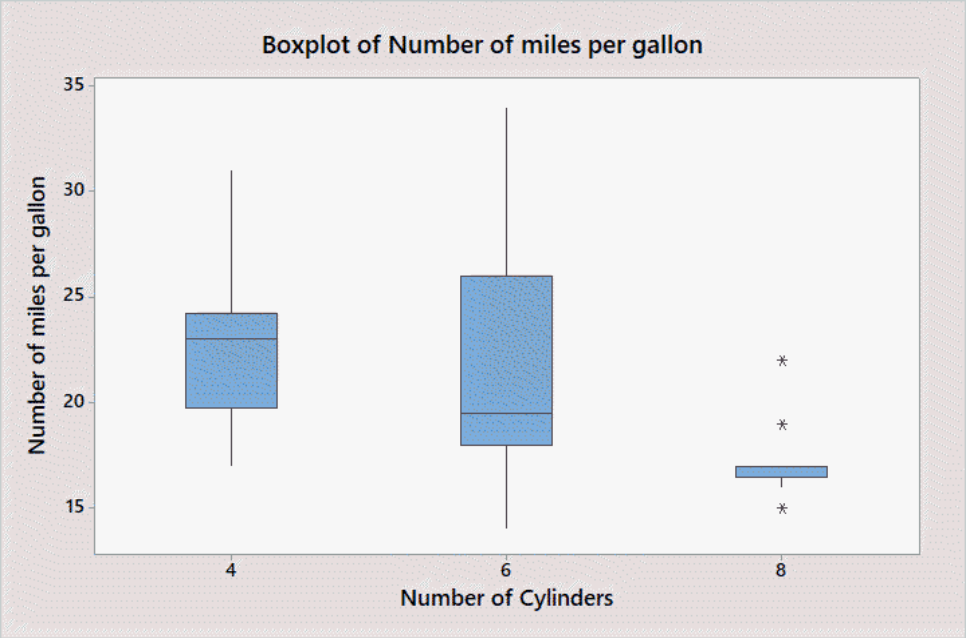

Figure 6

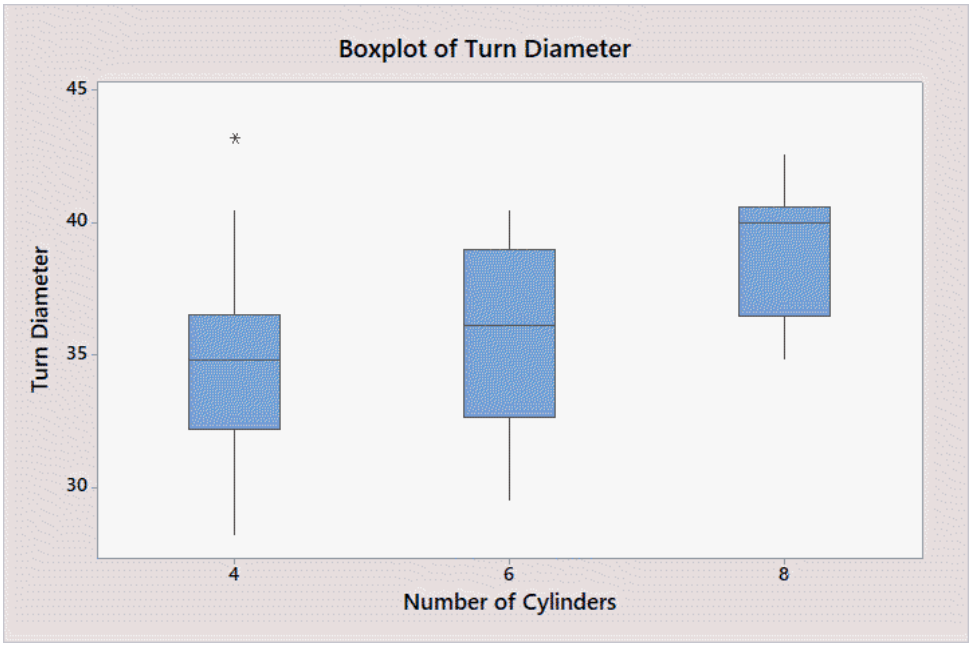

Figure 7

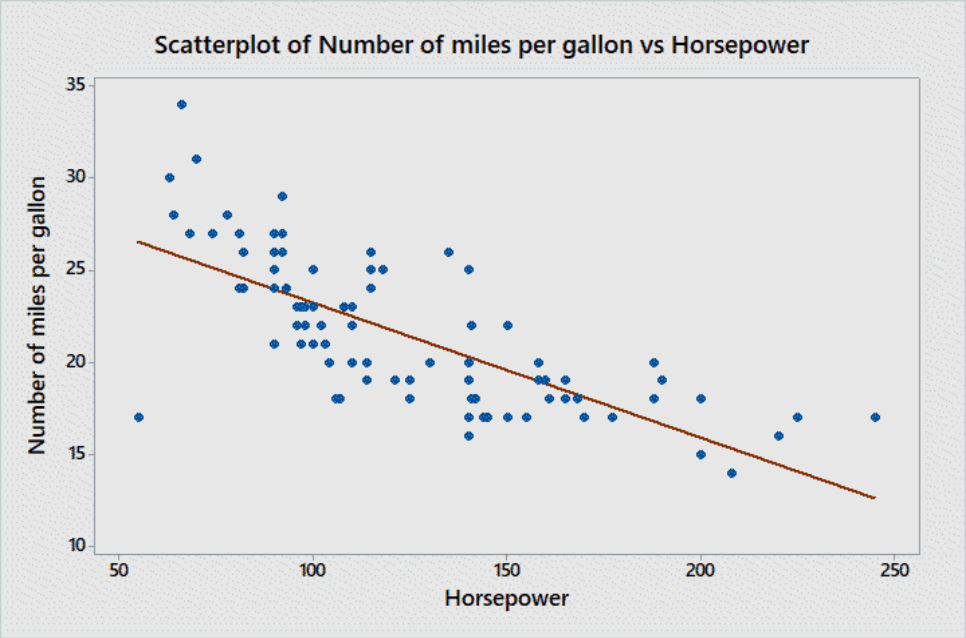

Figure 8