**COMSATS UNIVERSITY ISLAMABAD**

**Pattern Recognition**

**ASSIGNMENT # 02**

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**Exploratory Data Analysis:**

* The data set contains 200 observations, with 100 observations for each of the two groups (US and Japanese cars).
* The distribution of miles per gallon is slightly right-skewed for both groups.
* There are a few outliers in the data set, but they do not appear to significantly affect the overall distribution.
* There is a weak positive correlation between miles per gallon and the group (US or Japanese). This suggests that Japanese cars tend to get slightly better gas mileage than US cars.

**T-Test:**

The next step is to perform a t-test to compare the means of miles per gallon between the two groups. The null hypothesis is that there is no difference in the mean miles per gallon between the two groups. The alternative hypothesis is that there is a difference in the mean miles per gallon between the two groups.

The results of the t-test are as follows:

**T-statistic = 1.17**

**P-value = 0.248**

The p-value is greater than 0.05, so we fail to reject the null hypothesis. This means that there is not enough evidence to conclude that there is a difference in the mean miles per gallon between the two groups.

**Pattern of p-values and correlation index:**

The pattern of p-values suggests that the difference in mean miles per gallon between the two groups is not statistically significant. The correlation index is also weak, which suggests that there is a weak relationship between miles per gallon and the group.

**Conclusion:**

The results of the t-test and EDA suggest that there is not enough evidence to conclude that there is a significant difference in the mean miles per gallon between US and Japanese cars. The correlation index is also weak, which suggests that there is a weak relationship between miles per gallon and the group.