**TASK#1:** An automotive company wants to identify and treat outliers in their "mtcars" dataset. which contains information about various car models. They suspect that certain car models might have outlier values in certain variables and want to analyze and handle them using Python.Perform the following outlier detection techniques.

* Box Plot , Z-score, IQR range, Scatter

import pandas as pd

import numpy as np

import matplotlib.pyplot as plt

from pydataset import data

mtcars = data('mtcars')

variables\_of\_interest = ['mpg', 'disp', 'hp', 'drat', 'wt', 'qsec']

plt.figure(figsize=(10, 6))

mtcars[variables\_of\_interest].boxplot()

plt.title('Box Plot for Outlier Detection')

plt.xticks(rotation=45)

plt.show()

from scipy.stats import zscore

z\_scores = zscore(mtcars[variables\_of\_interest])

abs\_z\_scores = np.abs(z\_scores)

outliers\_zscore = (abs\_z\_scores > 3).any(axis=1)

print("Outliers detected using Z-score method:")

print(mtcars[outliers\_zscore])

Q1 = mtcars[variables\_of\_interest].quantile(0.25)

Q3 = mtcars[variables\_of\_interest].quantile(0.75)

IQR = Q3 - Q1

lower\_bound = Q1 - 1.5 \* IQR

upper\_bound = Q3 + 1.5 \* IQR

outliers\_iqr = ((mtcars[variables\_of\_interest] < lower\_bound) | (mtcars[variables\_of\_interest] > upper\_bound)).any(axis=1)

print("\nOutliers detected using IQR method:")

print(mtcars[outliers\_iqr])

plt.figure(figsize=(10, 6))

for var in variables\_of\_interest:

    plt.scatter(mtcars.index, mtcars[var], label=var)

threshold\_value = 300

plt.axhline(y=threshold\_value, color='r', linestyle='--', label=f'Threshold: {threshold\_value}')

plt.title('Scatter Plot for Outlier Detection with Threshold')

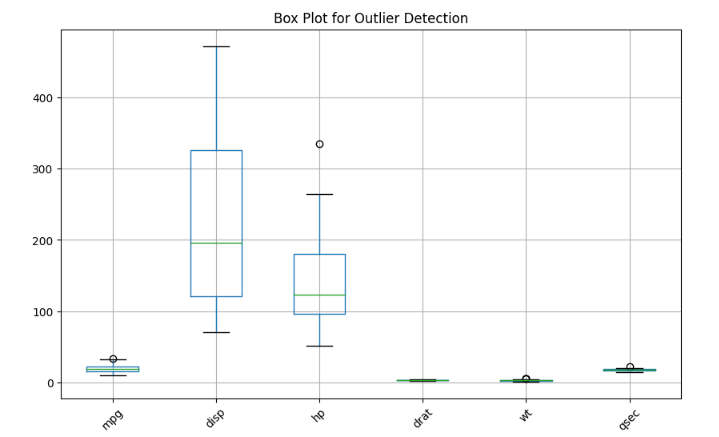
plt.xlabel('Index')

plt.ylabel('Values')

plt.legend()

plt.show()

A screenshot of a computer screen

Description automatically generated

A screen shot of a graph

Description automatically generated

TASK#2: