**Analyzing the Impact of Recession on Automobile Sales**

You have been hired by XYZ Automotives as a data scientist. Your first task is to analyze the historical data and give the company directors insights on how the sales were affected during times of recession. You will provide a number of charts/plots to visualize the data and make it easy for the directors to understand your analysis.

**Part 1: Create visualizations using Matplotib, Seaborn & Folium**

Objective:

The objective of this part of the Final Assignment is to analyze the historical trends in automobile sales during recession periods. The goal is to provide insights into how the sales of XYZ Automotives, a company specializing in automotive sales, were affected during times of recession.

In this lab you will create visualizations using Matplotlib, Seaborn, Pandas.

Tasks to be performed

TASK 1.1: Develop a Line chart using the functionality of pandas to show how automobile sales fluctuate from year to year.

TASK 1.2: Plot different lines for categories of vehicle type and analyse the trend to answer the question “Is there a noticeable difference in sales trends between different vehicle types during recession periods?”

TASK 1.3: Use the functionality of Seaborn Library to create a visualization to compare the sales trend per vehicle type for a recession period with a non-recession period.

TASK 1.4: Use sub plotting to compare the variations in GDP during recession and non-recession period by developing line plots for each period.

TASK 1.5: Develop a Bubble plot for displaying the impact of seasonality on Automobile Sales.

TASK 1.6: Use the functionality of Matplotlib to develop a scatter plot to identify the correlation between average vehicle price relate to the sales volume during recessions.

TASK 1.7: Create a pie chart to display the portion of advertising expenditure of XYZ Automotives during recession and non-recession periods.

TASK 1.8: Develop a pie chart to display the total Advertisement expenditure for each vehicle type during recession period.

TASK 1.9: Develop a countplot to analyse the effect of the unemployment rate on vehicle type and sales during the Recession Period.

**Part 2: Create Dashboard using Plotly and Dash**

Objective:

The objective of this part of the final assignment is to create dashboards to contain your plots and charts and to provide the directors with the ability to select a particular report or a period of time so they can discuss the data in detail.

In this lab you will create dashboards using Dash and Plotly and then add user-interactions to your

dashboards.

Creating dashboards and adding customizations to the dashboards

The directors of XYZAutomobiles have requested a dashboard to be developed so they can drill into the data in more detail for specific years or by different categories. Your second task is to create a suitable dashboard and add in user interactions so that the directors can select the data they want to review without the need to request new plots.

Tasks to be performed

TASK 2.1: Create a Dash application and give it a meaningful title.

TASK 2.2: Add drop-down menus to your dashboard with appropriate titles and options.

Task 2.3: Add a division for output display with appropriate id and classname property

TASK 2.4: Creating Callbacks; Define the callback function to update the input container based on the selected statistics and the output container.

TASK 2.5: Create and display graphs for Recession Report Statistics.

TASK 2.6: Create and display graphs for Yearly Report Statistics.