

Final Assignment: Part 3

Review fellow learners

Congrats on submitting your assignment! You have reviewed enough peers, but you can continue to review peers and provide constructive feedback.

Analyzing Trends in Historical Automobile Sales Data During Recession and Non-Recession Years

Submitted on October 20, 2025

[Shareable Link](#)

Prompt

Task 1.1 - Develop a Line plot using the functionality of pandas to show how automobile sales fluctuate from year to year.

Image [Line_plot_1.png](#), Automobile Sales During Recession

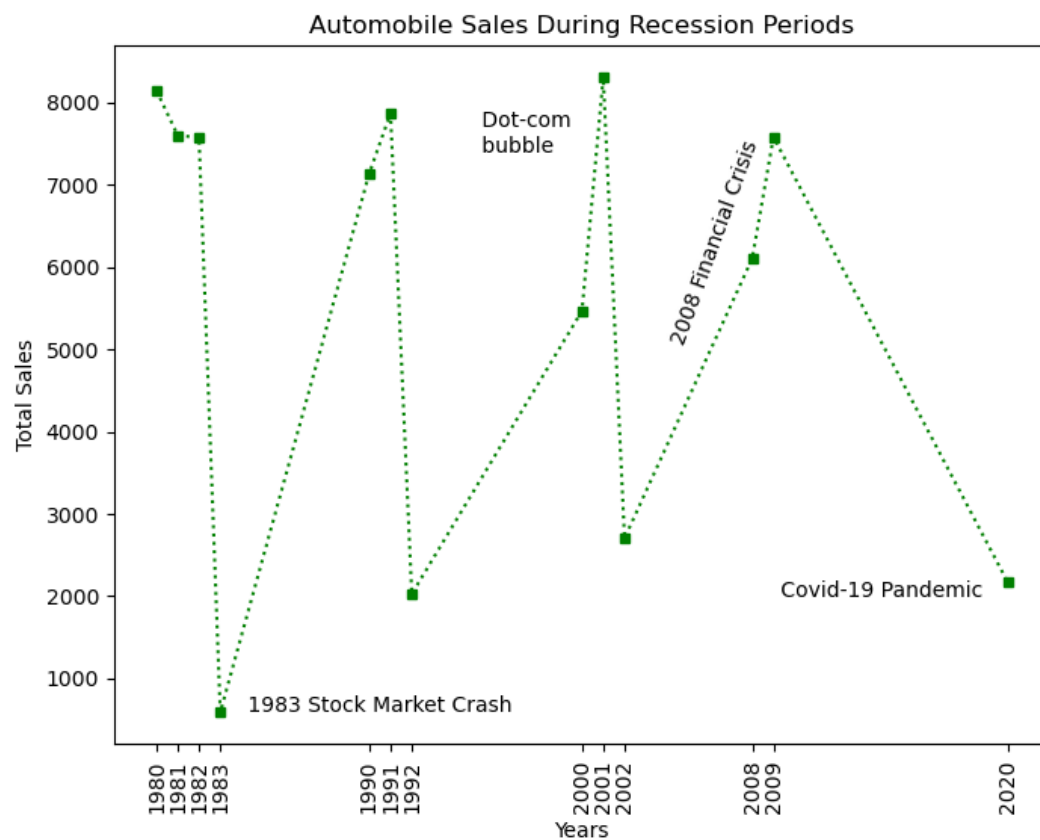


Fig. 1.1: Line plot displaying automobile sales during recession years with annotations marking events of the 1983 Stock Market Crash, Dot-com bubble burst, 2008 Financial Crisis, and the Covid-19 Pandemic. *The graph does not represent non-recession years because the title called for "Automobile Sales During Recession"

Prompt

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?"

Image [Line_plot_2.png](#), Sales Trends by Vehicle Type During Recession Years

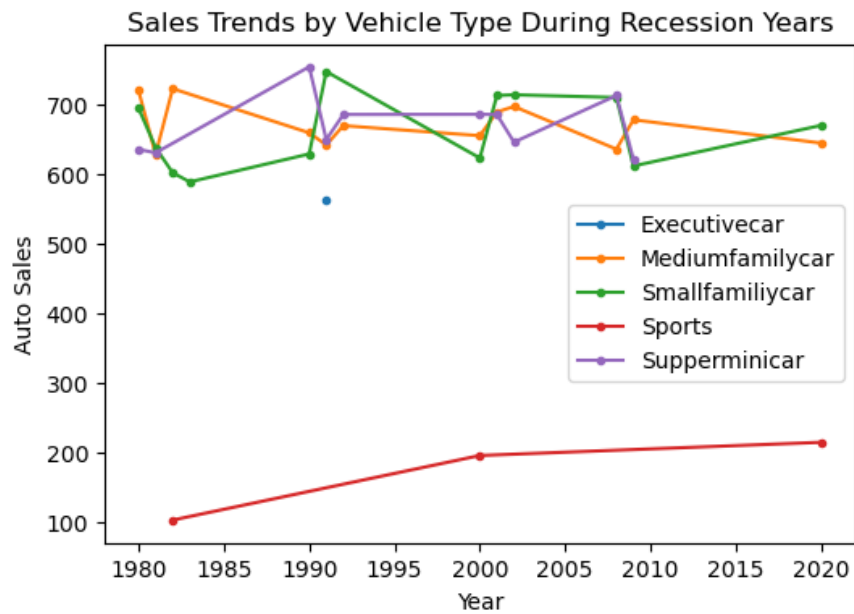


Fig. 1.2: Line plot displaying automobile sales trends by vehicle type during recession years. Yes. There is a noticeable difference in sales trends between different vehicle types. Most vehicle types sold between 600 and 700 units during recession years, with the exception of Sports and Executivecar vehicles. Sales of sports vehicles grew gradually across recession years, but experienced lower sales in terms of volume compared to other vehicle types. Added incentives to buy Sports vehicles likely attributed to the slight uptick in sales growth, as well as changes in personal preferences and consumers spending habits. Lower demand and differences in consumer preferences may explain poor sales performance for Executivecar.

Prompt

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.

Image **Bar_Chart.png**, Sales Trends by Vehicle Type During Recession and Non-Recession Periods

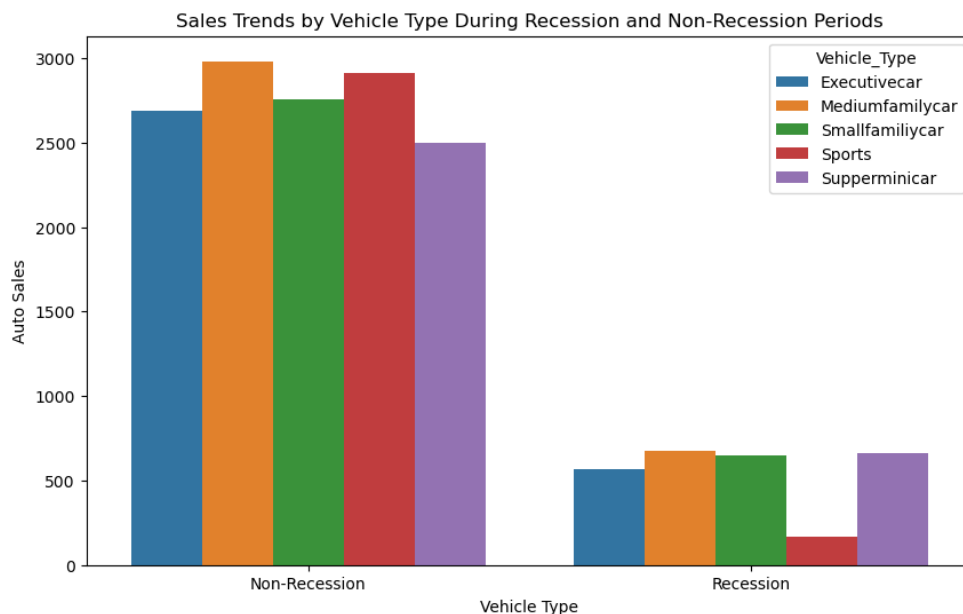


Fig. 1.3: Bar chart displaying automobile sales trends by vehicle type during recession and non-recession periods.

Prompt

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.

Image **Subplot.png**, GDP Performance During Recession and Non-Recession Periods

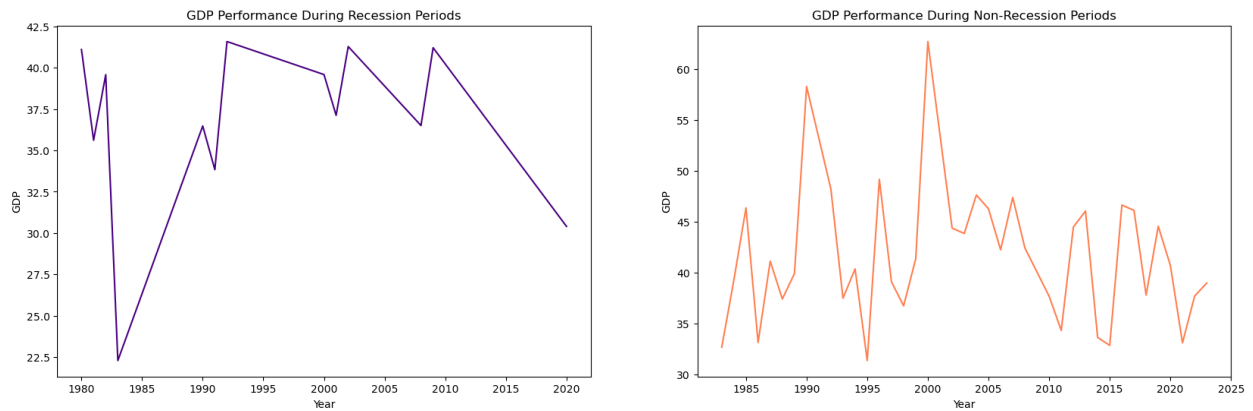


Fig. 1.4: Line plots comparing GDP performance during periods of recession and non-recession.

Prompt

Task 1.5 - Develop a Bubble plot for displaying the impact of seasonality on Automobile Sales.

Image **Bubble.png**, Seasonality Impact on Automobile Sales

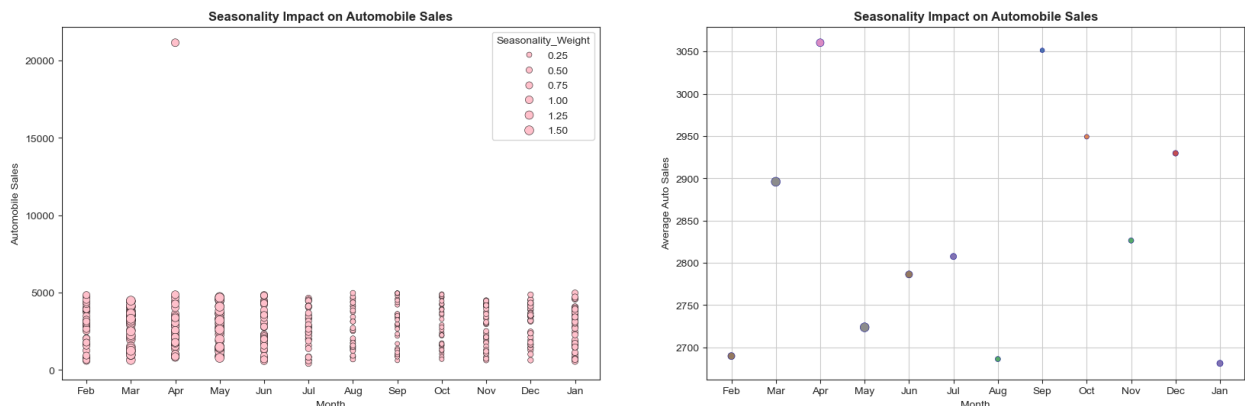


Fig. 1.5: Bubble plots displaying seasonality's impact on automobile sales. *Since the data was across all months, I included another plot aggregating the averages as well.

Prompt

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.

Image **Scatter.png**, Relationship between Average Vehicle Price and Sales during Recessions

Relationship between Average Vehicle Price and Sales during Recessions

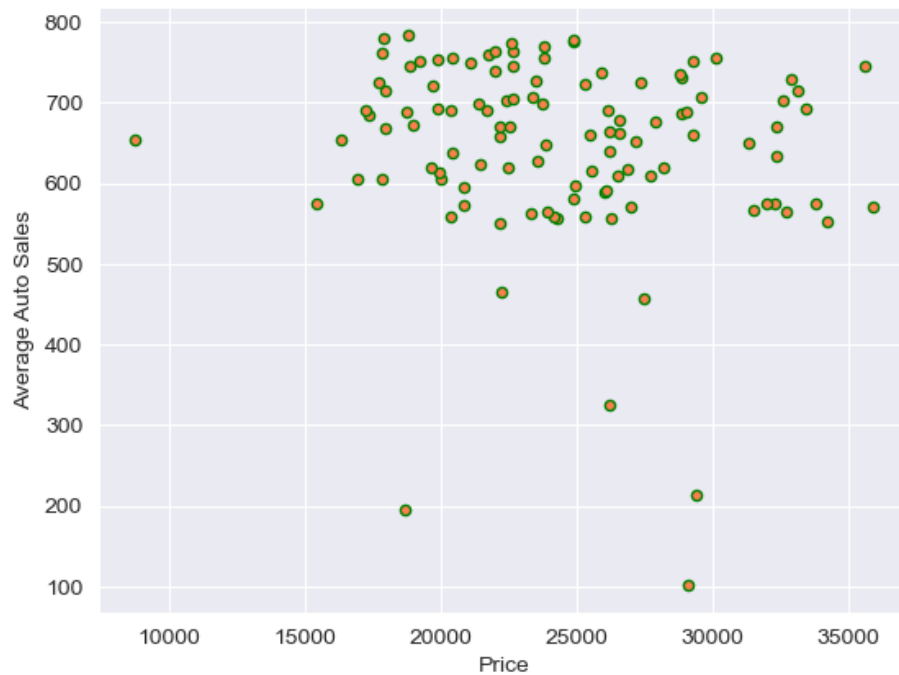


Fig. 1.6: Scatter plot displaying relationship between average vehicle price and automobile sales during recession periods. No correlation is seen between attributes.

Prompt

Task 1.7 - Create a pie chart to display the portion of advertising expenditure of XYZAutomotives during recession and non-recession periods.

Image **Pie_1.png**, Advertising Expenditure During Recession and Non-Recession Periods

Advertising Expenditure During Recession and Non-Recession Periods

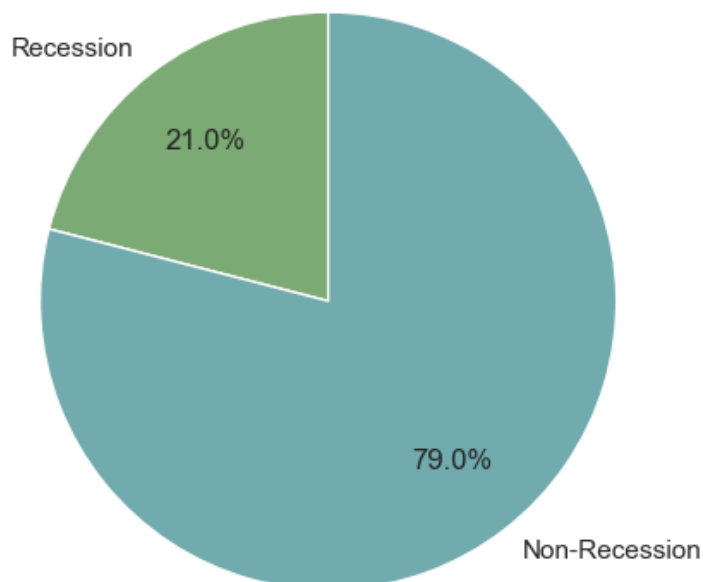


Fig. 1.7: Pie chart displaying the proportion of advertising expenditures during recession and non-recession years.

Prompt

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

Image *Pie_2.png*, Advertising Expenditure by Vehicle Type During Recession Period

Advertising Expenditure by Vehicle Type During Recession Period

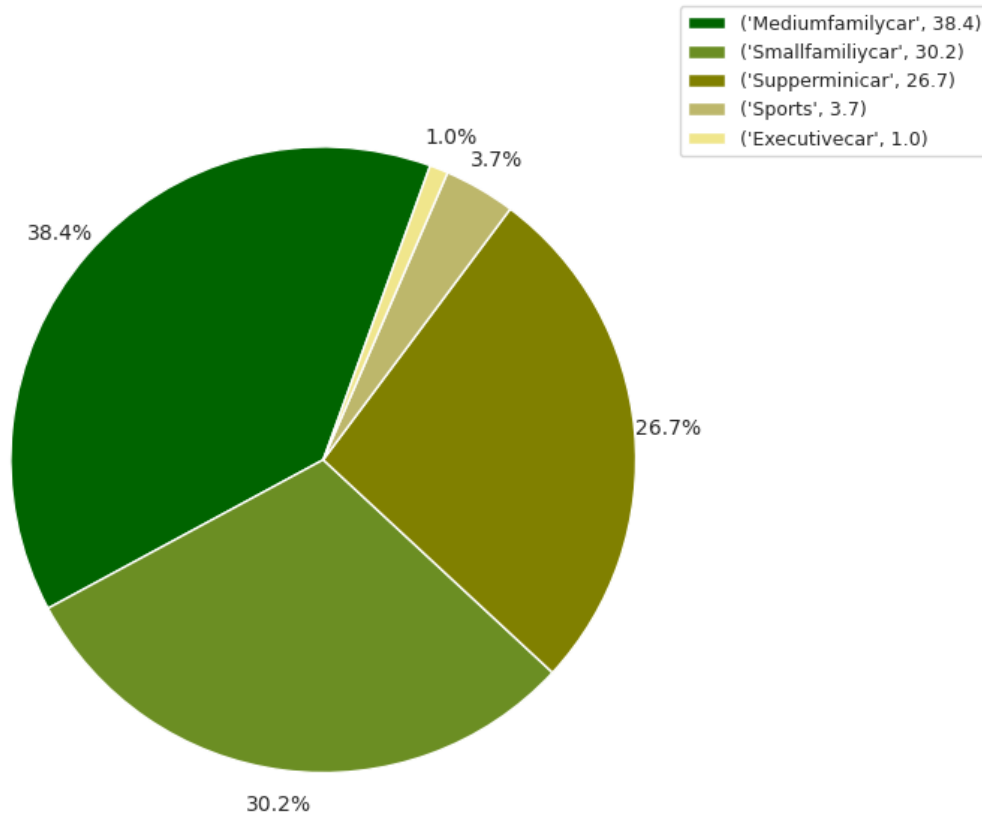


Fig. 1.8: Pie chart displaying the proportion of advertising expenditures by vehicle type during recession periods.

Prompt

Task 1.9 - Develop a line plot to analyse the effect of the unemployment rate on vehicle type and sales during the Recession Period.

Image *Line_plot_3.png*, Effect of Unemployment Rate on Vehicle Type and Sales

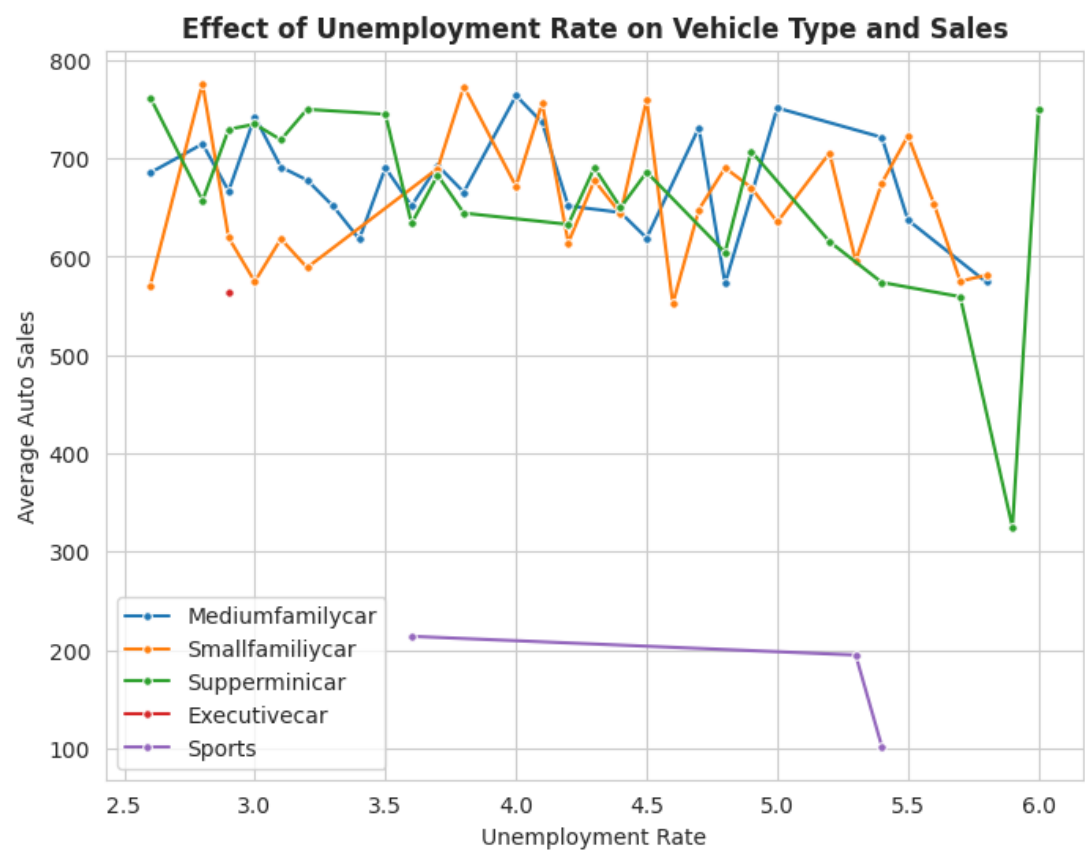


Fig. 1.9: Line plot displaying the unemployment rates effect on automobile sales by vehicle type.

Prompt

Task 2.1 - Create a Dash application and give it a meaningful title.

Image **Title.png**, Automobile Sales Statistics Dashboard



Fig. 2.1: Title page for the Automobile Sales Statistics Dashboard.

Prompt

Task 2.2 - Add drop-downs to your dashboard with appropriate titles and options.

Image **Dropdown.png**, Dropdown Menus for Automobile Sales Statistics Dashboard

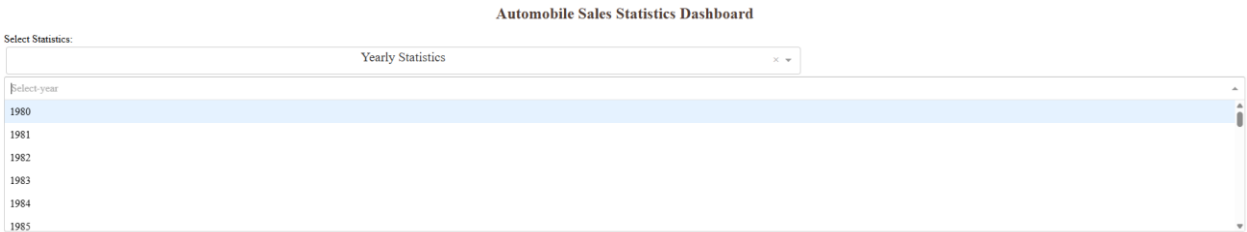


Fig. 2.2: Two dashboard dropdowns for Automobile Sales Statistics Dashboard.

Prompt

Task 2.3 - Add a division for output display with appropriate 'id' and 'classname' properties.

Image **outputdiv.png**, Division for Output Display

```
html.Div([#TASK 2.3: Add a (inner) division for output display
html.Div(id='input-container', className='chart-grid', style={'display':'flex'}),
html.Div(id='output-container', className='chart-grid', style={'display':'flex'}),
])
])
```

Fig. 2.3: HTML inner division for output display.

Prompt

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

Image **Callbacks.png**, Callback Functions to Update Input Container

```
#TASK 2.4: Creating Callbacks
# Define the callback function to update the input container based on the selected statistics
@app.callback(
    Output(component_id='select-year', component_property='disabled'),
    Input(component_id='dropdown-statistics', component_property='value'))

def update_input_container(selected_statistics):
    if selected_statistics == 'Yearly Statistics':
        return False
    else:
        return True

#Callback for plotting
# Define the callback function to update the input container based on the selected statistics
@app.callback(
    Output(component_id='output-container', component_property='children'),
    [Input(component_id='dropdown-statistics', component_property='value'),
    Input(component_id='select-year', component_property='value')])
```

Fig. 2.4: Callback functions to update input container for selected statistics.

Prompt

Task 2.5 - Create and display graphs for Recession Report Statistics.

Image **RecessionReportgraphs.png**, Graphs for Recession Report Statistics

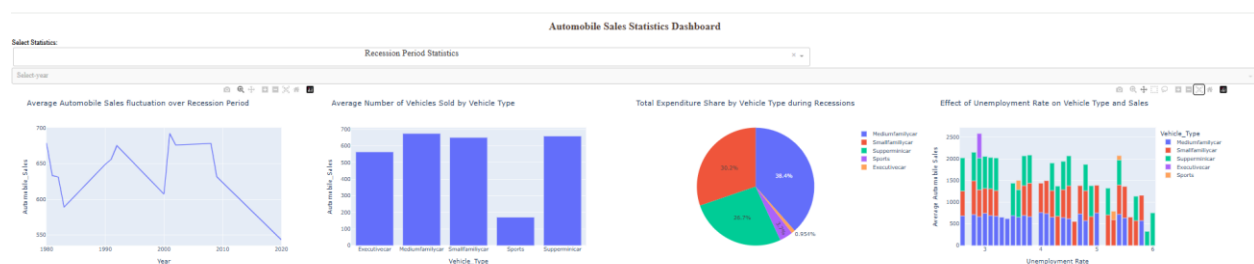


Fig. 2.5: Display of graphs used for recession report statistics.

Prompt

Task 2.6 - Create and display graphs for Yearly Report Statistics.

Image **YearlyReportgraphs.png** for the report types, Graphs for Yearly Report Statistics

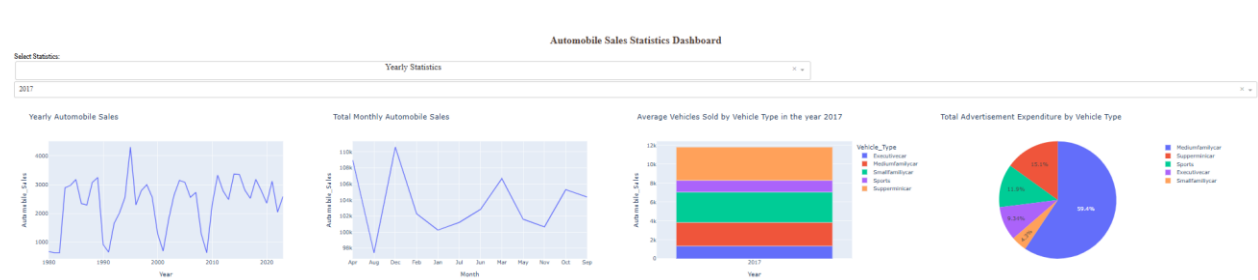


Fig. 2.6: Display of graphs for Yearly Report Statistics.