# INT 232 PROJECT REPORT

# MTCARS SHINY DASHBOARD

Submitted by

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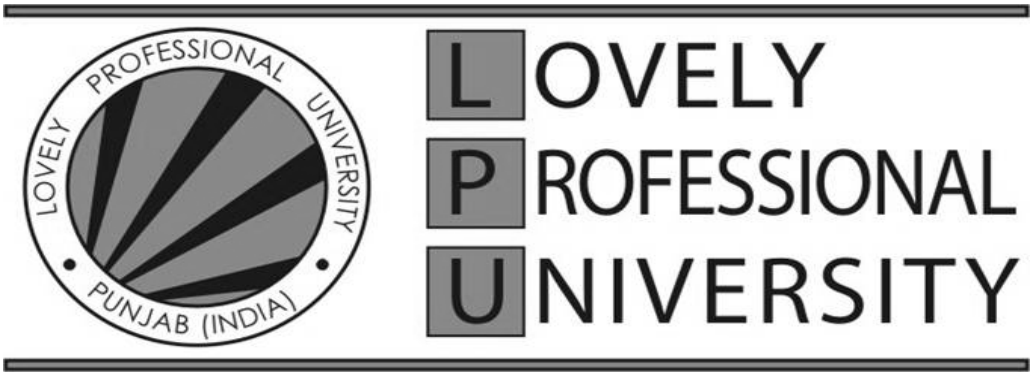
KM027 INT 232

Under the Guidance of : Ms. Savleen Kaur

Lovely Professional University, Phagwara



# CERTIFICATE

This is to certify that **Vijay Deshmukh** bearing Registration no. 12019859 has completed INT 232 project titled, **"MTCARS SHINY DASHBOARD"** under my guidance and supervision. To the best of my knowledge, the present work is the result of his/her original development, effort and study.

**Signature and Name of the Supervisor**

**Designation of the Supervisor**

**School of Computer Science**

Lovely Professional University

Phagwara, Punjab.

# DECLARATION

I, **Vijay Deshmukh**, student of Computer Science Discipline at, Lovely Professional University, Punjab, hereby declare that all the information furnished in this project report is based on my own intensive work and is genuine.

Date: 21-04-2023

Registration No.12019859

Signature

**Vijay Deshmukh**

# INTRODUCTION

I have created an R programming shiny dashboard of  This dashboard provides an interactive view of MTCARS.

This data set contains various fields like mpg, cyl, disp, drat,wt and many more which helps to analyze various conditions due to which causalities happens.

With the help of parameters and calculated fields also using different color , size , labels, interactive filters which I made dynamic and interactive dashboard.

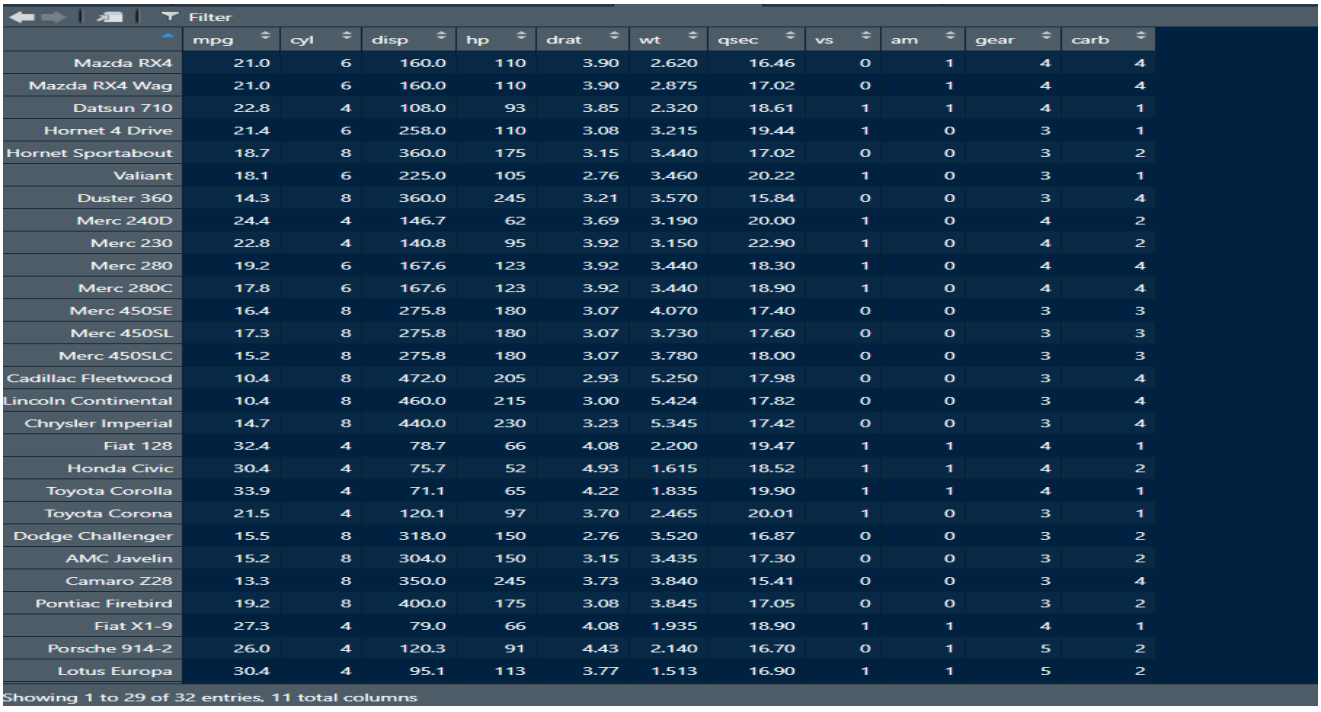
Thus, giving charismatic visualization.

# OBJECTIVES

Here are the few main objects that are discussed in the dashboard

- ***Scatter Plot***
- ***Line Chart***
- ***Bar Chart***
- ***Box Chart***
- ***Histogram***
- ***Density Plot***
- ***Heat Map***
- ***Scatter Matrix***

# SOURCE OF DATASET



Filter

| | mpg | cyl | disp | hp | drat | wt | qsec | vs | am | gear | carb |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mazda RX4 | 21.0 | 6 | 160.0 | 110 | 3.90 | 2.620 | 16.46 | 0 | 1 | 4 | 4 |
| Mazda RX4 Wag | 21.0 | 6 | 160.0 | 110 | 3.90 | 2.875 | 17.02 | 0 | 1 | 4 | 4 |
| Datsun 710 | 22.8 | 4 | 108.0 | 93 | 3.85 | 2.320 | 18.61 | 1 | 1 | 4 | 1 |
| Hornet 4 Drive | 21.4 | 6 | 258.0 | 110 | 3.08 | 3.215 | 19.44 | 1 | 0 | 3 | 1 |
| Hornet Sportabout | 18.7 | 8 | 360.0 | 175 | 3.15 | 3.440 | 17.02 | 0 | 0 | 3 | 2 |
| Valiant | 18.1 | 6 | 225.0 | 105 | 2.76 | 3.460 | 20.22 | 1 | 0 | 3 | 1 |
| Duster 360 | 14.3 | 8 | 360.0 | 245 | 3.21 | 3.570 | 15.84 | 0 | 0 | 3 | 4 |
| Merc 240D | 24.4 | 4 | 146.7 | 62 | 3.69 | 3.190 | 20.00 | 1 | 0 | 4 | 2 |
| Merc 230 | 22.8 | 4 | 140.8 | 95 | 3.92 | 3.150 | 22.90 | 1 | 0 | 4 | 2 |
| Merc 280 | 19.2 | 6 | 167.6 | 123 | 3.92 | 3.440 | 18.30 | 1 | 0 | 4 | 4 |
| Merc 280C | 17.8 | 6 | 167.6 | 123 | 3.92 | 3.440 | 18.90 | 1 | 0 | 4 | 4 |
| Merc 450SE | 16.4 | 8 | 275.8 | 180 | 3.07 | 4.070 | 17.40 | 0 | 0 | 3 | 3 |
| Merc 450SL | 17.3 | 8 | 275.8 | 180 | 3.07 | 3.730 | 17.60 | 0 | 0 | 3 | 3 |
| Merc 450SLC | 15.2 | 8 | 275.8 | 180 | 3.07 | 3.780 | 18.00 | 0 | 0 | 3 | 3 |
| Cadillac Fleetwood | 10.4 | 8 | 472.0 | 205 | 2.93 | 5.250 | 17.98 | 0 | 0 | 3 | 4 |
| Lincoln Continental | 10.4 | 8 | 460.0 | 215 | 3.00 | 5.424 | 17.82 | 0 | 0 | 3 | 4 |
| Chrysler Imperial | 14.7 | 8 | 440.0 | 230 | 3.23 | 5.345 | 17.42 | 0 | 0 | 3 | 4 |
| Fiat 128 | 32.4 | 4 | 78.7 | 66 | 4.08 | 2.200 | 19.47 | 1 | 1 | 4 | 1 |
| Honda Civic | 30.4 | 4 | 75.7 | 52 | 4.93 | 1.615 | 18.52 | 1 | 1 | 4 | 2 |
| Toyota Corolla | 33.9 | 4 | 71.1 | 65 | 4.22 | 1.835 | 19.90 | 1 | 1 | 4 | 1 |
| Toyota Corona | 21.5 | 4 | 120.1 | 97 | 3.70 | 2.465 | 20.01 | 1 | 0 | 3 | 1 |
| Dodge Challenger | 15.5 | 8 | 318.0 | 150 | 2.76 | 3.520 | 16.87 | 0 | 0 | 3 | 2 |
| AMC Javelin | 15.2 | 8 | 304.0 | 150 | 3.15 | 3.435 | 17.30 | 0 | 0 | 3 | 2 |
| Camaro Z28 | 13.3 | 8 | 350.0 | 245 | 3.73 | 3.840 | 15.41 | 0 | 0 | 3 | 4 |
| Pontiac Firebird | 19.2 | 8 | 400.0 | 175 | 3.08 | 3.845 | 17.05 | 0 | 0 | 3 | 2 |
| Fiat X1-9 | 27.3 | 4 | 79.0 | 66 | 4.08 | 1.935 | 18.90 | 1 | 1 | 4 | 1 |
| Porsche 914-2 | 26.0 | 4 | 120.3 | 91 | 4.43 | 2.140 | 16.70 | 0 | 1 | 5 | 2 |
| Lotus Europa | 30.4 | 4 | 95.1 | 113 | 3.77 | 1.513 | 16.90 | 1 | 1 | 5 | 2 |

Showing 1 to 29 of 32 entries, 11 total columns

# ETL PROCESS

The ETL (Extract, Transform, Load) process is a common method for preparing data for analysis. Here's an example of how you could use Shiny Dashboard to create an ETL process for the mtcars dataset in R:

- Extract: Load the mtcars dataset into R using the mtcars function.

  data(mtcars)

- Transform: Perform any necessary transformations on the data, such as filtering or creating new variables.

- Load: Save the transformed data to a file or database for later use. For this example, we'll save the transformed data as a CSV file.

- Shiny Dashboard: Now we can create a Shiny Dashboard to automate this ETL process.

- This Shiny Dashboard defines three action buttons for Extract, Transform, and Load. When the user clicks each button, the corresponding action is performed on the data, and a message is displayed to confirm that the action has been completed.

# Analysis on dataset (for each analysis)

## INTRODUCTION

The Mtcars dataset in R is a popular dataset that contains information on various features of 32 different automobile models. Some of the variables included in the dataset are mpg (miles per gallon), cyl (number of cylinders), disp (displacement), hp (horsepower), and drat (rear axle ratio). In this analysis, we will be exploring this dataset using various data visualization techniques such as scatter plots, line charts, bar charts, box plots, histograms, density plots, and heat maps.

Using these visualization techniques, we will try to gain insights into the relationships between different variables and identify any patterns or trends that exist in the data. For example, we can use scatter plots to examine the relationship between mpg and horse power or use box plots to compare the distribution of mpg for different numbers of cylinders.

# General Description

The mtcars dataset is a built-in dataset in R programming that contains data on various aspects of 32 cars. The variables included in the dataset are:

- mpg: Miles per gallon
- cyl: Number of cylinders
- disp: Displacement (cubic inches)
- hp: Gross horsepower
- drat: Rear axle ratio
- wt: Weight (1000 lbs)
- qsec: 1/4 mile time
- vs: Engine (0 = V-shaped, 1 = straight)
- am: Transmission (0 = automatic, 1 = manual)
- gear: Number of forward gears
- carb: Number of carburetors

In this analysis, we will be using various visualizations like scatter plots, line charts, bar charts, box plots,

histograms, density plots, and heat maps to explore and analyze the relationships between these variables and gain insights from the data. By utilizing these visualizations in a Shiny Dashboard.

# Specific Requirements, functions and formulas and prediction models

## Packages:

- shiny: a package for creating interactive web applications in R.
- ggplot2: a package for creating data visualizations in R.
- dplyr: a package for data manipulation and wrangling in R.
- plotly: a package for creating interactive data visualizations in R.
- ggtext: a package for formatting text in ggplot2.
- png: a package for working with PNG images in R.
- ggbackground: a package for creating background images in ggplot2.

**UI Components:**

- fluidPage: a function that creates a responsive Shiny app layout.
- titlePanel: a function that sets the page title.
- tags$style: a function that adds CSS styling to the app.
- sidebarLayout: a function that creates a layout with a sidebar and a main panel.
- sidebarPanel: a function that creates a panel in the sidebar.
- selectInput: a function that creates a dropdown menu to select input values.
- mainPanel: a function that creates the main panel of the app.
- tags$div: a function that creates a division for the main panel.
- tabsetPanel: a function that creates tabs for the main panel.
- tabPanel: a function that creates a tab for the tabsetPanel.

**Server Components:**

- renderPlotly: a function that renders a plot using Plotly.
- ggplot: a function that creates a ggplot2 object.
- aes_string: a function that creates a mapping between variables and aesthetics using strings.
- geom_point: a function that creates a scatter plot layer.
- labs: a function that sets plot titles and axis labels.
- theme_minimal: a function that sets a minimalistic theme for the plot.
- theme: a function that sets the plot's theme.
- element_line: a function that sets the line properties of a plot element.
- element_text: a function that sets the text properties of a plot element.
- element_rect: a function that sets the rectangle properties of a plot element.
- geom_line: a function that creates a line plot layer.
- geom_bar: a function that creates a bar plot.

# Analysis Results

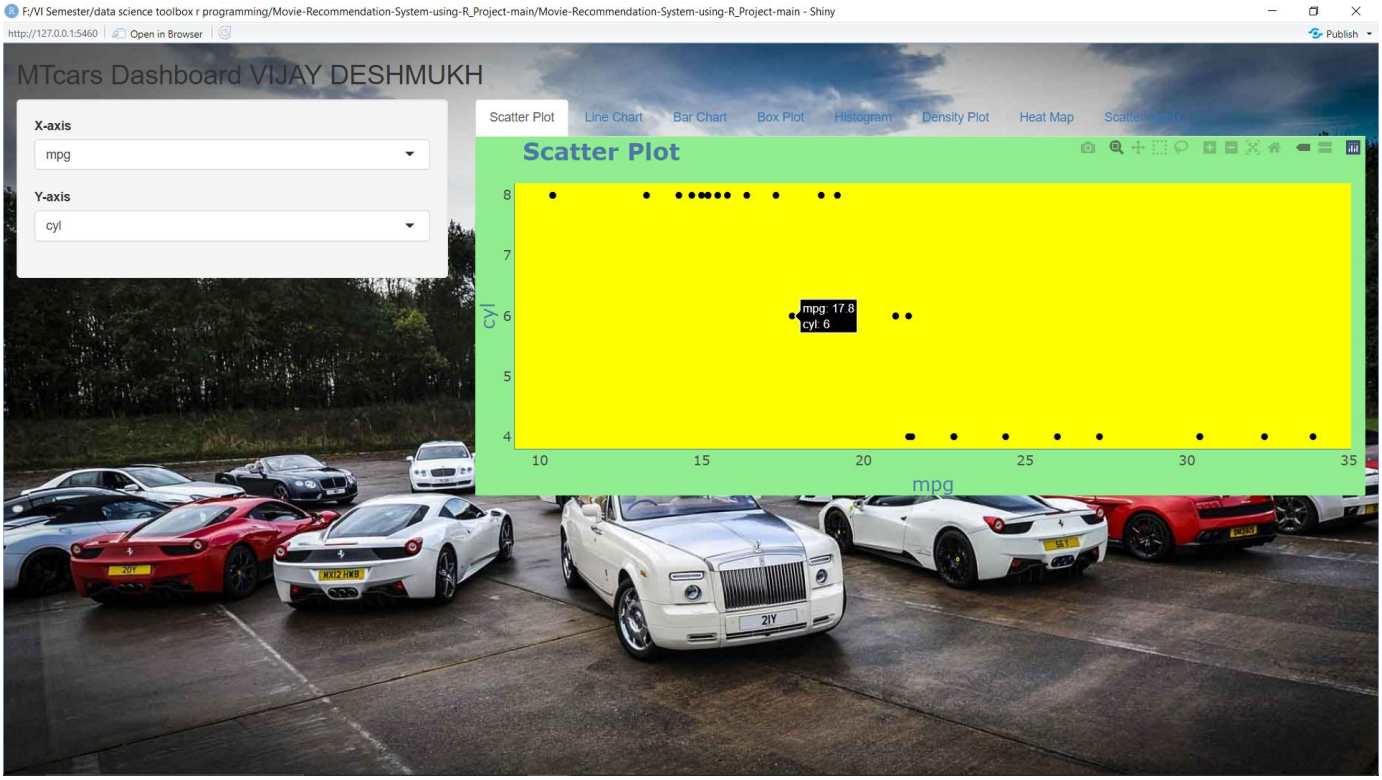
Shiny app that generates various plots (scatter plot, line chart, bar chart, box plot, histogram, density plot, heat map, and scatter matrix) based on user input. The app uses the mtcars dataset, which is a built-in dataset in R, and various plotting packages such as ggplot2, plotly, and ggtext.

The UI of the app has a title panel that displays the title of the app and a sidebar layout that allows the user to select the X-axis and Y-axis variables for the plots. The main panel of the app displays the various plots generated by the app based on user input.

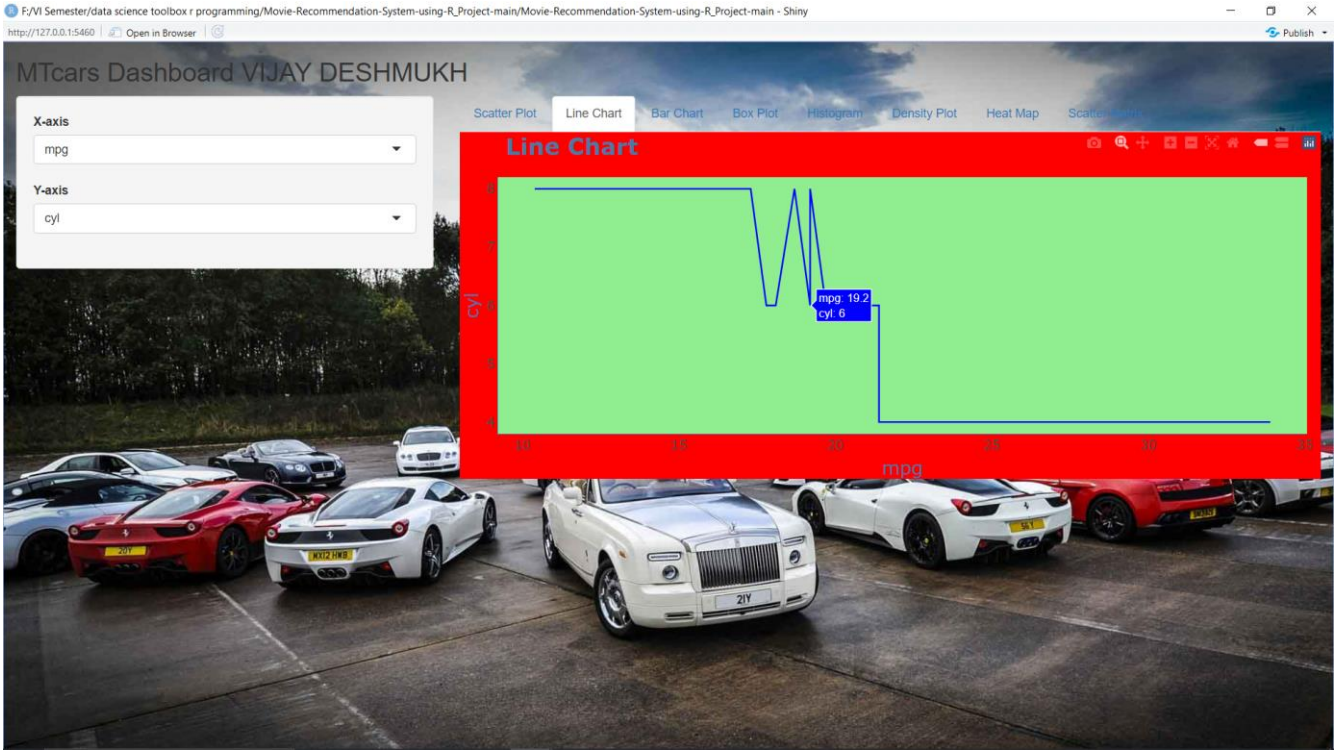
The app is a simple yet powerful tool for generating various plots based on the mtcars dataset and user input, and can be easily modified or extended to work with other datasets and plot types.

# Visualization

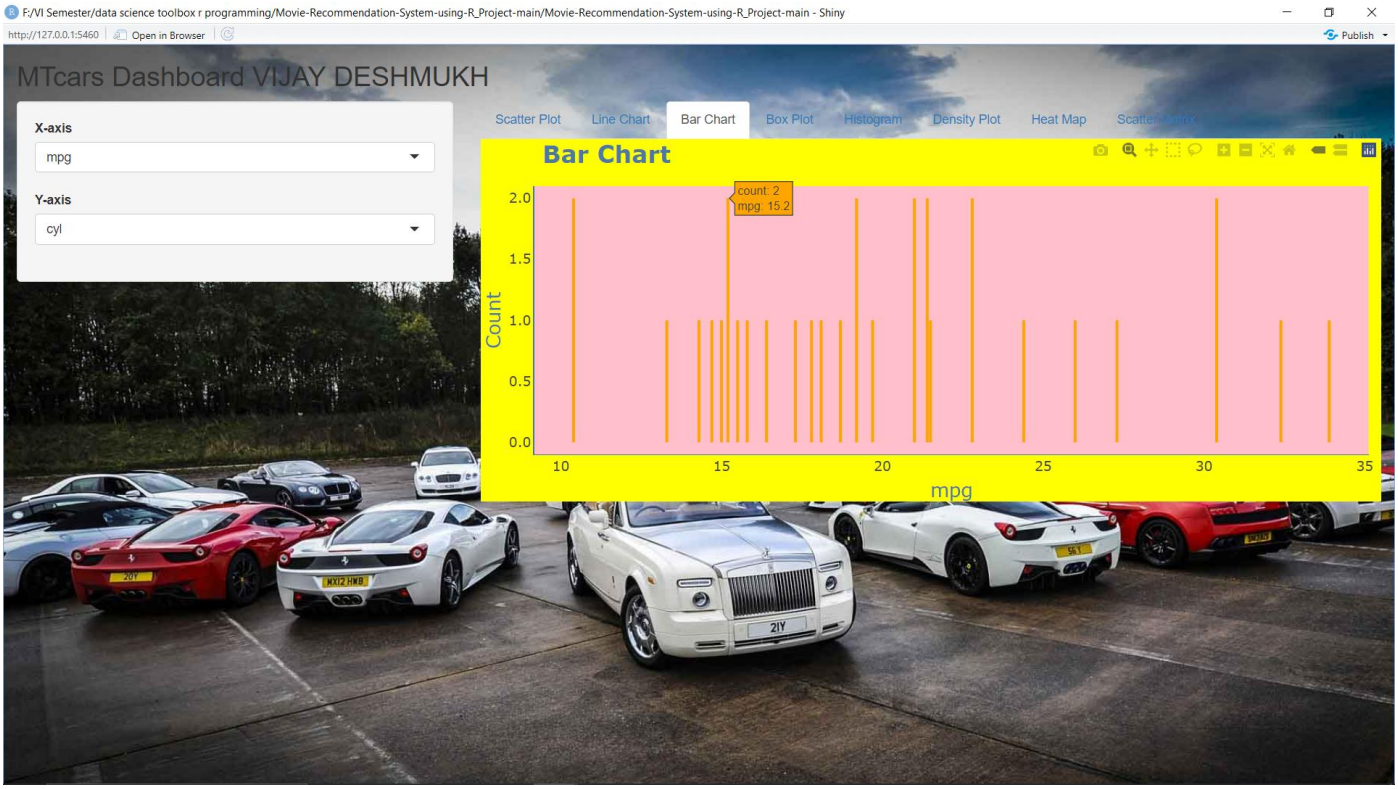
## 1.SCATTER PLOT



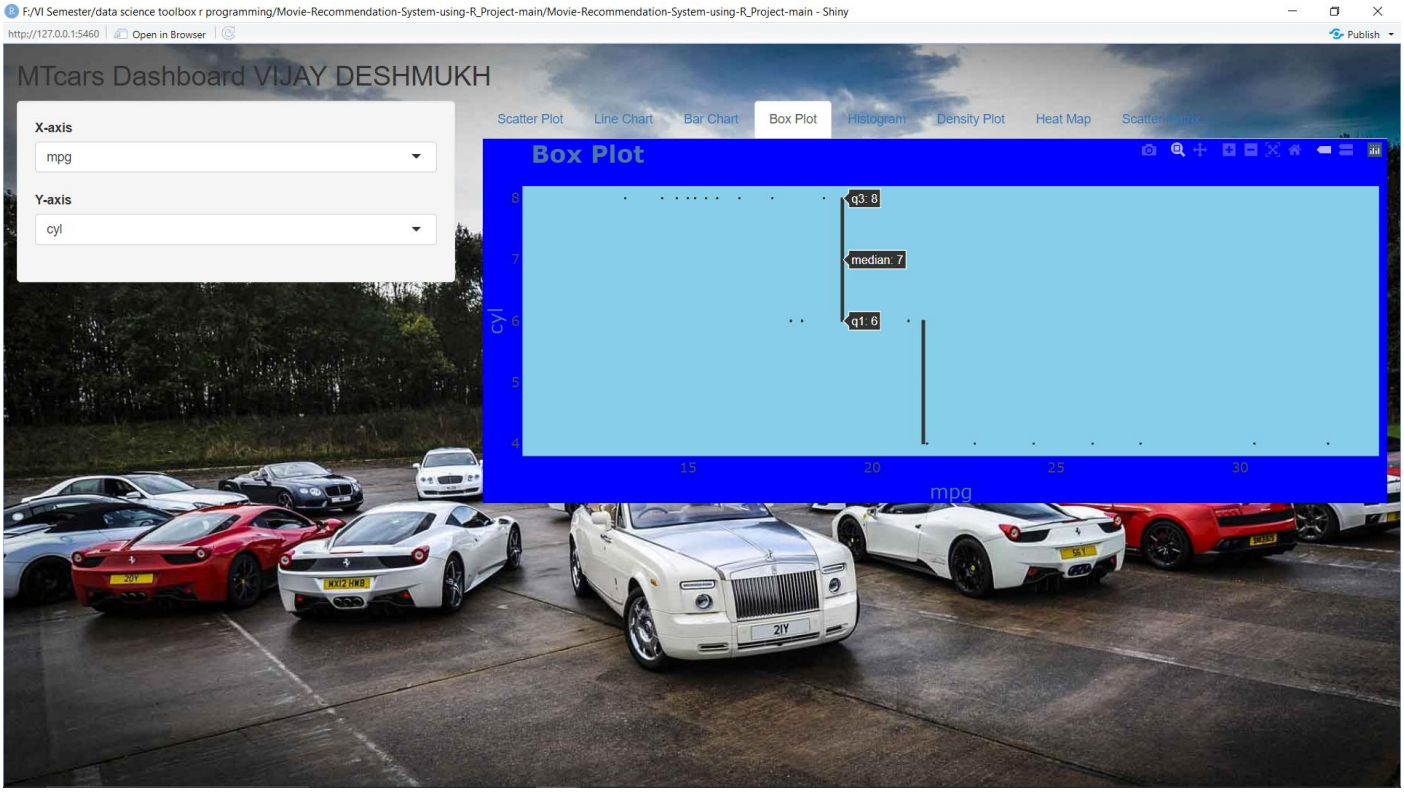

## 2.LINE CHART



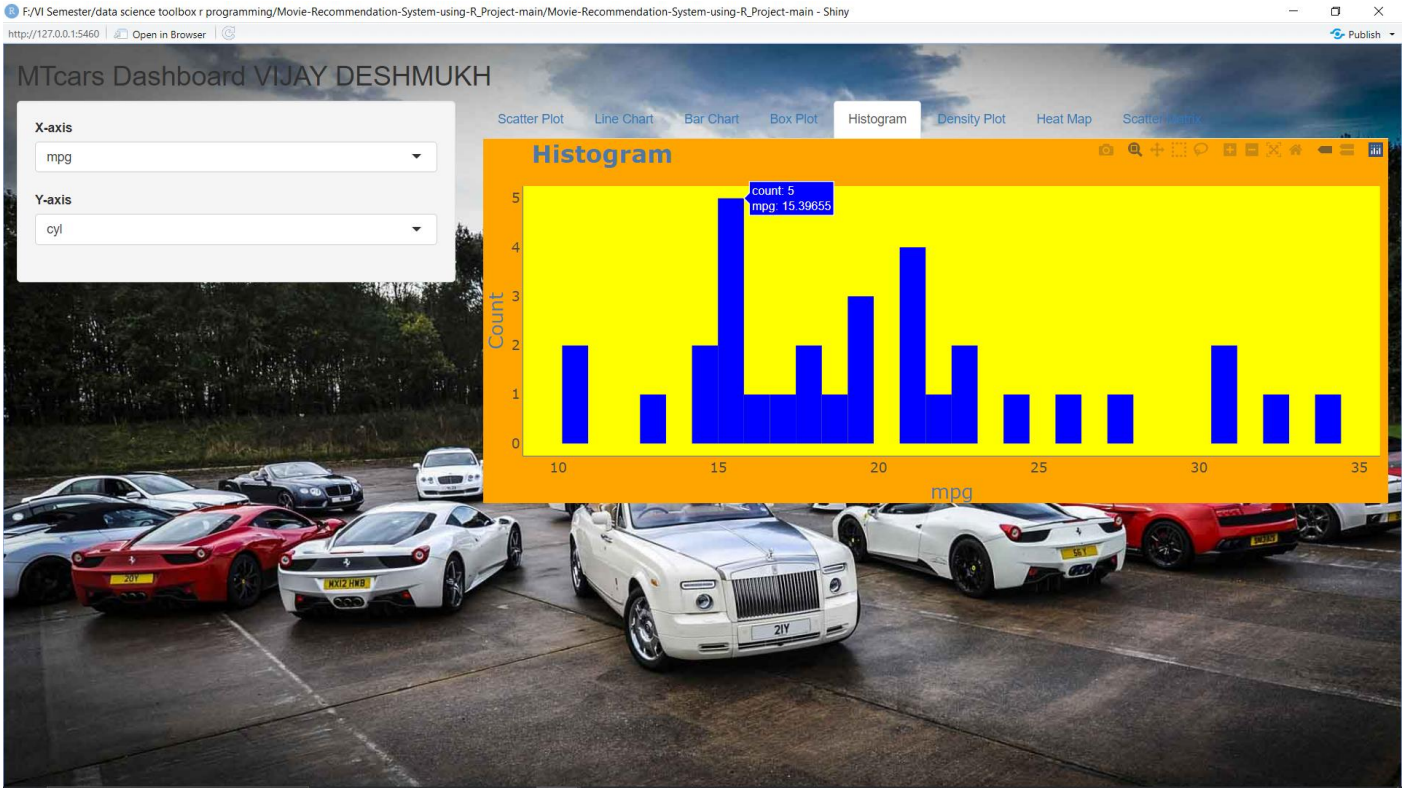
# 3.BAR CHART



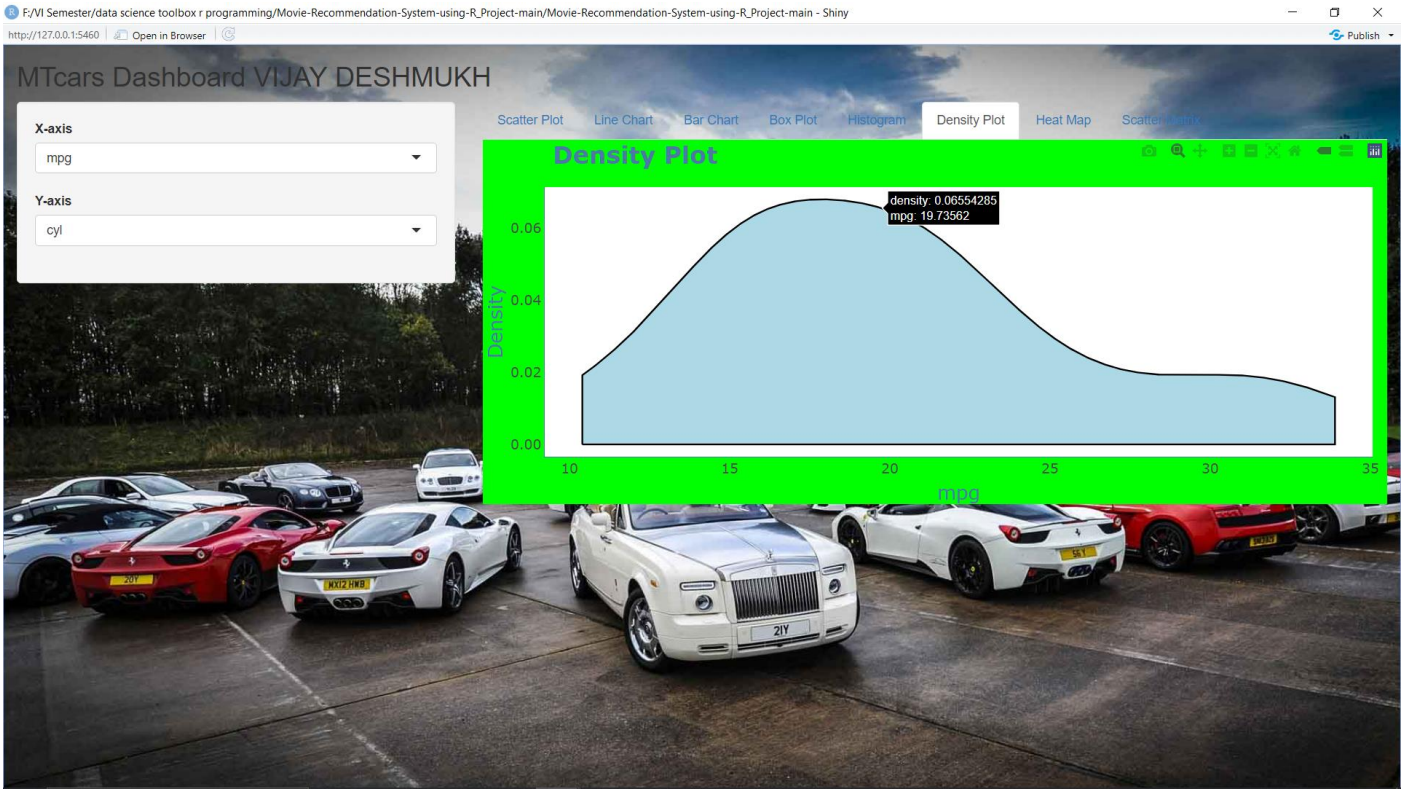

# 4.BOX PLOT



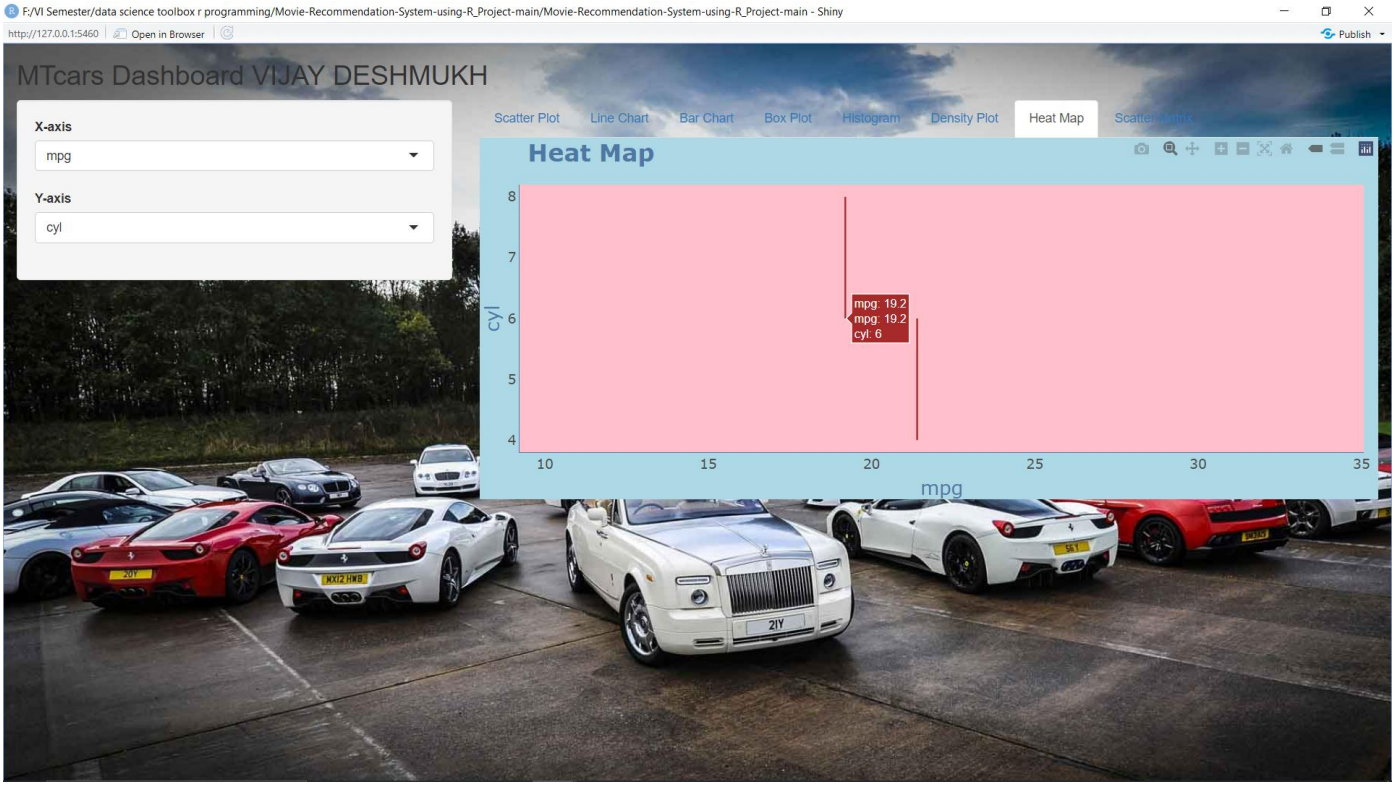
# 5.HISTOGRAM



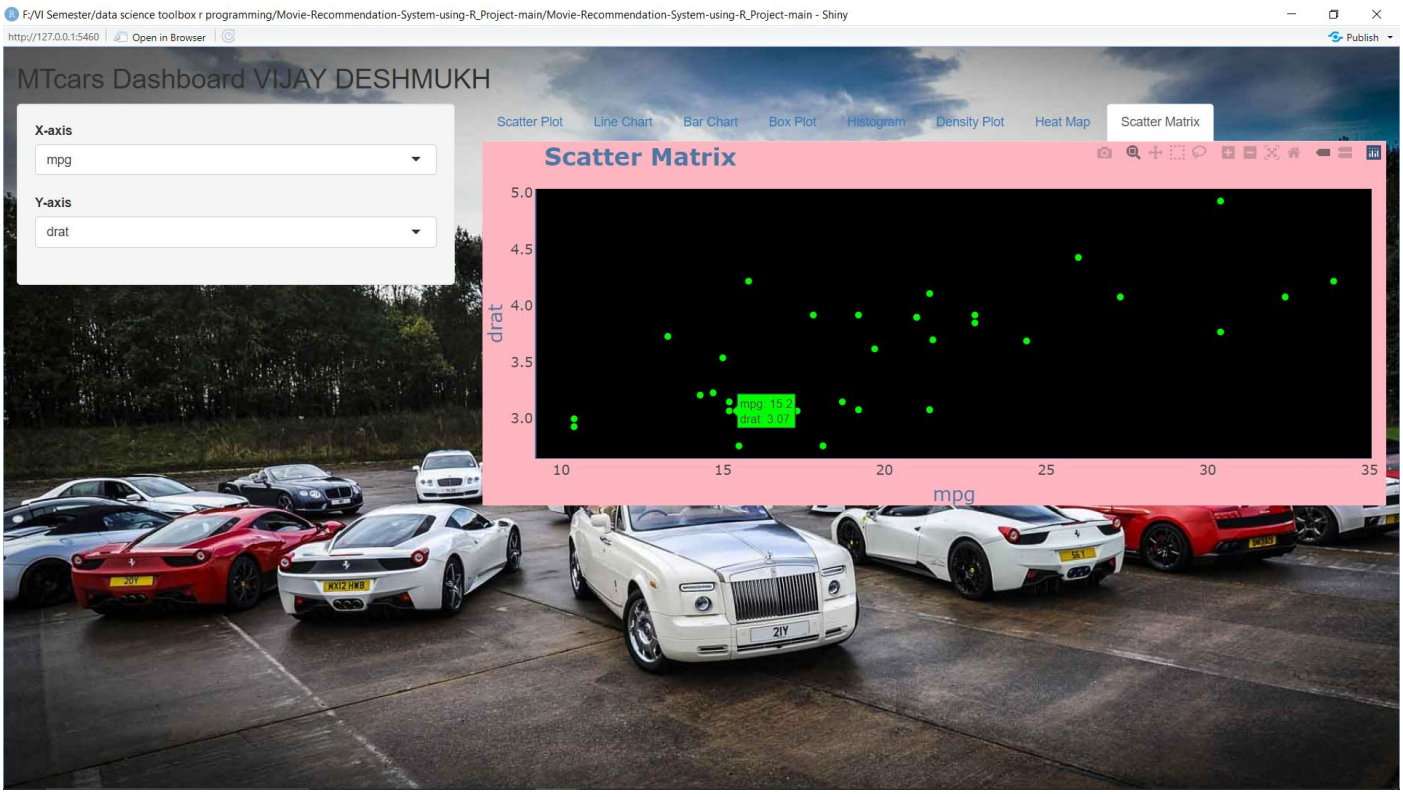

# 6.DENSITY PLOT



# 7.HEAT MAP




# 8.SCATTER MATRIX



# List of Analysis with results

- UI design: The code defines the UI (user interface) of a Shiny app using the fluidPage() function. The UI includes a title panel, a sidebar layout with two input select dropdowns for selecting the x and y-axis variables, and a main panel with a tabset panel. The tabset panel includes several tabs, each with a plotly output.

- Plot types: The code defines several types of plots: scatter plot, line chart, bar chart, box plot, histogram, density plot, heat map, and scatter matrix.

- Data visualization: The code uses ggplot2 and plotly libraries to create data visualizations for the selected dataset, mtcars. The renderPlotly() function is used to render the plots as plotly objects.

- Plot customization: The code includes several options for customizing the appearance of the plots. This includes changing the plot title and axis labels, adding a background color and image, and changing the color and size of various plot elements such as axis lines, titles, and grids.

- Dynamic inputs: The code uses input$x_axis and input$y_axis to dynamically update the selected x and y-axis variables based on user input from the sidebar input select dropdowns.

- Tab colors: The code adds colors to each tab of the tabset panel to make it more visually appealing.

- Shiny server: The code defines a server function to handle the reactive logic of the Shiny app. It uses the ggplot() function to create the plots and render them using renderPlotly().

# References


- https://rpubs.com/odenipinedo/intermediate-data-visualization-with-ggplot2
- https://www.youtube.com/watch?v=tfN10IUX9Lo

# THANK YOU