

**Data Visualization Project**  
**Graph recommendation system**

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## **Report**

### **Problem statement:**

Requirement is to make a system in which user comes to system and upload its .csv file and system shows all columns, system asks user to pick No. of columns on which he wants to perform analysis. System also asks user for analysis type (univariate, bivariate, multivariate) and at last system shows all possible plots.

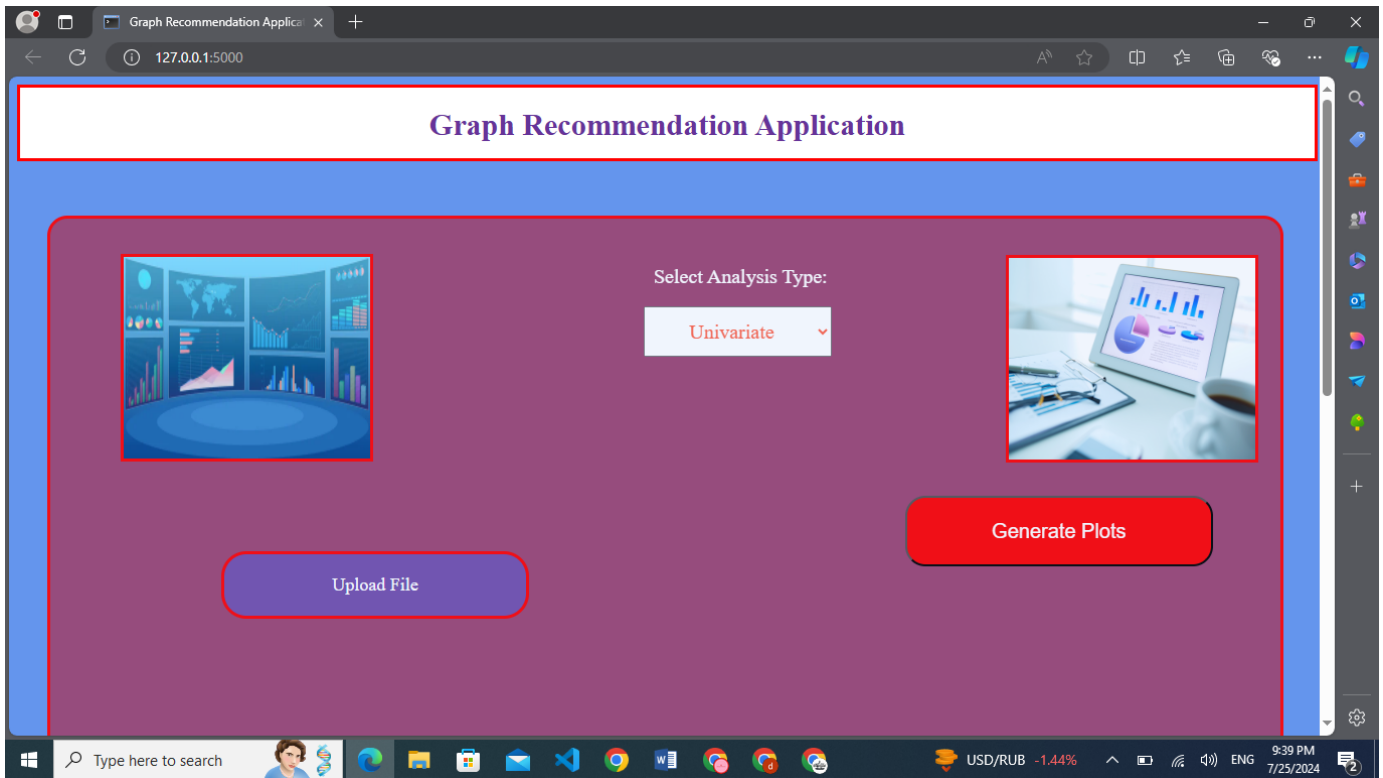
### **Objective:**

- Allow user to upload .csv file
- To select Analysis type
- To pick No. of columns
- To provide relevant recommendation graphs

### **Architecture:**

This is user interface given below.

- I used a button for uploading file.
- I used a dropdown arrow for selecting type of analysis.
- I used a button for generating plots.



## Component description:

I used following languages for it.

- I used HTML, CSS, java Script for front-end building.
- I used Python, Flask for back-end building.

## Workflow:

I used switch-cases in this project.

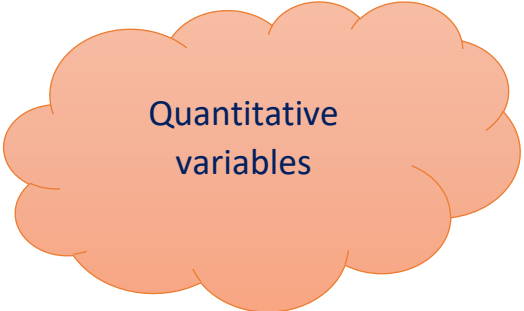
- I. Quantitative vs. Quantitative
- II. Categorical vs. Categorical
- III. Quantitative vs. Categorical
- IV. Categorical vs. Quantitative

## Data Visualization functions:

I used a lot of graphs in this project.

### Univariate Analysis:

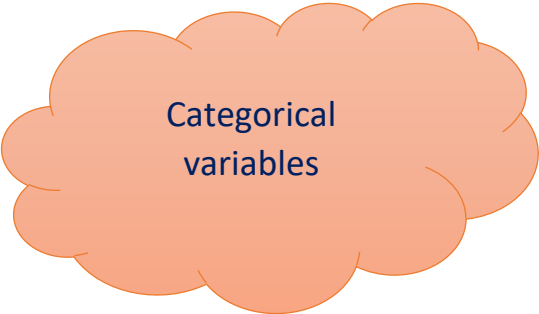
1. Histogram
2. Empirical cumulative distribution
3. Area chart
4. Lollipop chart
5. Dot chart



Quantitative  
variables

←

- 
6. Count plot
  7. Bar chart
  8. Bubble chart
  9. Pie chart
  10. Donut chart



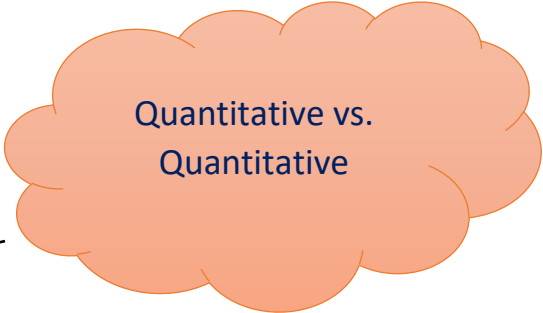
Categorical  
variables

←

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### Bivariate Analysis:

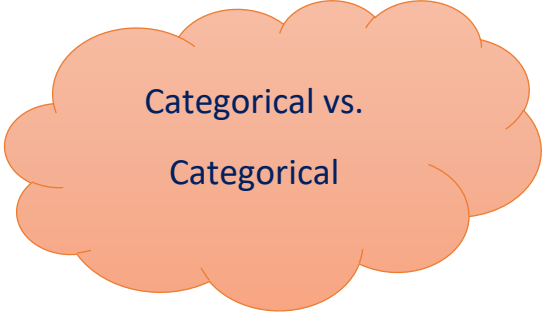
11. Scatter plot
12. Line plot



Quantitative vs.  
Quantitative

←

- 
13. Stacked bar chart
  14. Grouped bar chart
  15. Segmented bar chart



Categorical vs.  
Categorical

←

-----  
16. Density plot

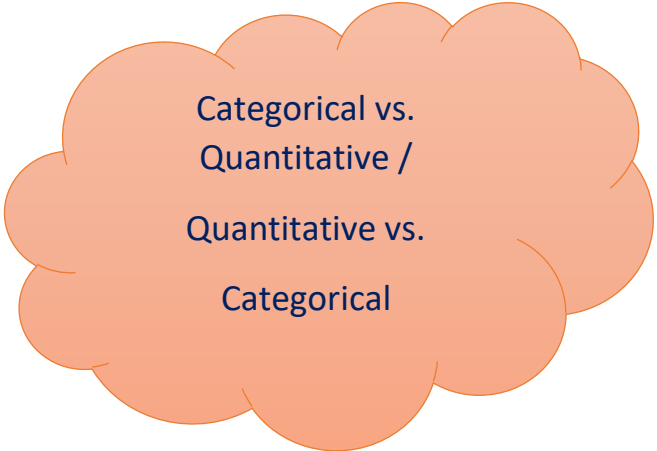
17. Strip plot

18. Box plot


19. Boxen plot

20. Violin plot

21. Swarm plot  
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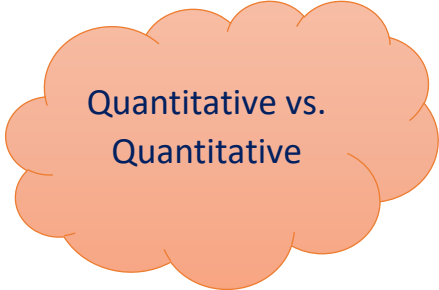


Categorical vs.  
Quantitative /  
Quantitative vs.  
Categorical




## Multivariate Analysis:

22. Heat Map  
-----

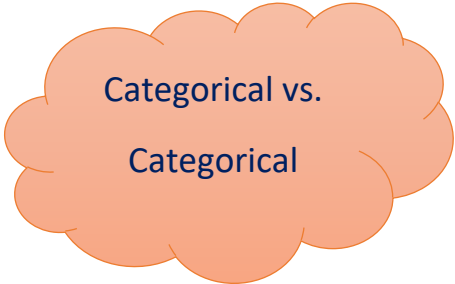


Quantitative vs.  
Quantitative




23. Tree Map

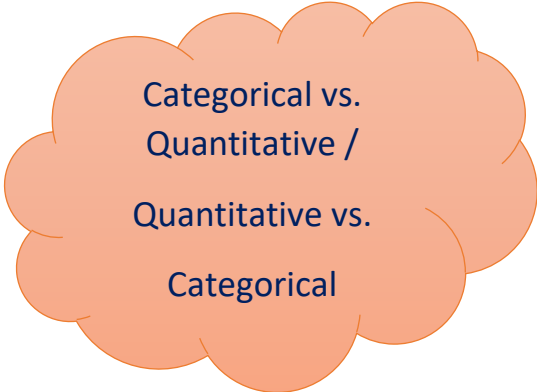
24. Mosaic plot  
-----




Categorical vs.  
Categorical



25. Multiple plot  
-----

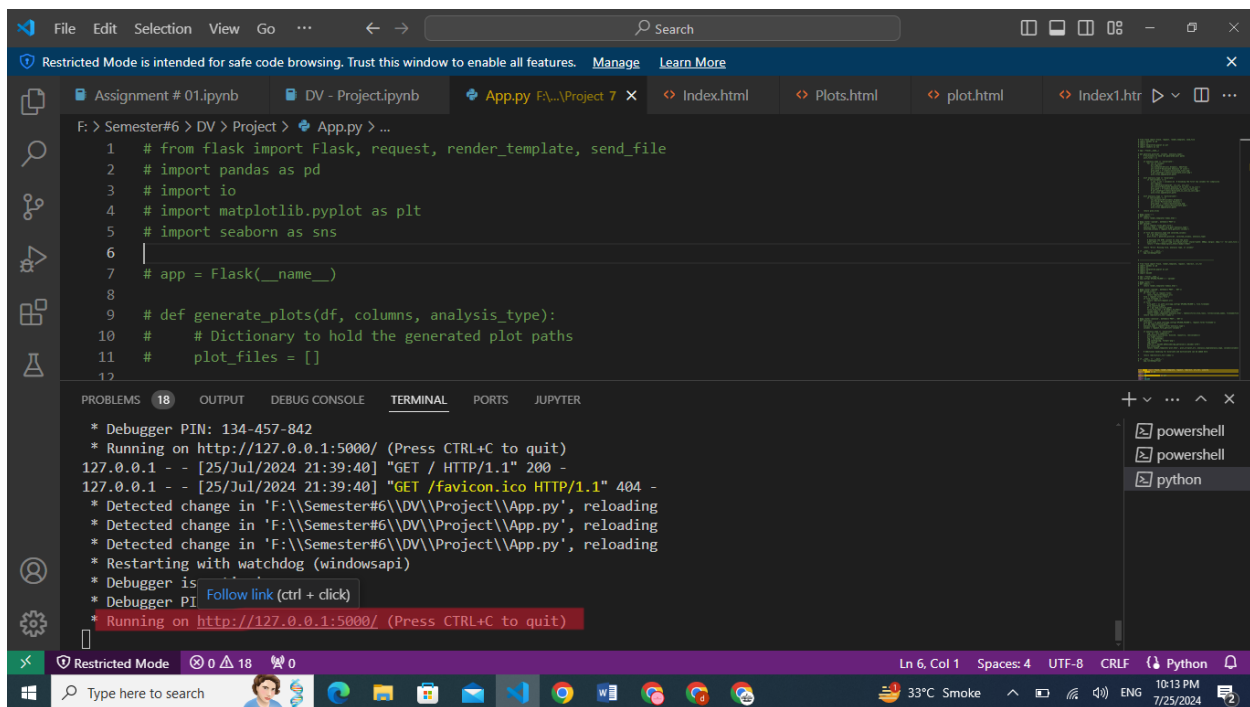


Categorical vs.  
Quantitative /  
Quantitative vs.  
Categorical



## How to run Code?

- I. First of all, user will come to flask file.
- II. He runs the code at going terminal, there will be appeared an IP and click the link.
- III. A front-end Website will be opened.
- IV. User will upload file, select analysis type and pick No. of columns for visualization.



The screenshot displays a Visual Studio Code (VS Code) editor window. The top bar shows the 'File', 'Edit', 'Selection', 'View', 'Go', and 'Search' menus. Below the menu bar, a notification states 'Restricted Mode is intended for safe code browsing. Trust this window to enable all features.' The editor has several tabs open: 'Assignment # 01.ipynb', 'DV - Project.ipynb', 'App.py FA...Project 7', 'Index.html', 'Plots.html', 'plot.html', and 'Index1.htm'. The active tab is 'App.py FA...Project 7', which contains the following Python code:

```
1 # from flask import Flask, request, render_template, send_file
2 # import pandas as pd
3 # import io
4 # import matplotlib.pyplot as plt
5 # import seaborn as sns
6 |
7 # app = Flask(__name__)
8 |
9 # def generate_plots(df, columns, analysis_type):
10 #     # Dictionary to hold the generated plot paths
11 #     plot_files = []
12 |
```

The bottom panel of the VS Code window shows the 'TERMINAL' tab. It contains the following output:

```
* Debugger PIN: 134-457-842
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
127.0.0.1 - - [25/Jul/2024 21:39:40] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [25/Jul/2024 21:39:40] "GET /favicon.ico HTTP/1.1" 404 -
* Detected change in 'F:\Semester#6\DV\Project\App.py', reloading
* Detected change in 'F:\Semester#6\DV\Project\App.py', reloading
* Detected change in 'F:\Semester#6\DV\Project\App.py', reloading
* Restarting with watchdog (windowsapi)
* Debugger is
* Debugger PI Follow link (ctrl + click)
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
```

The bottom status bar of the VS Code window shows 'Ln 6, Col 1', 'Spaces: 4', 'UTF-8', 'CRLF', 'Python', and the system clock '10:13 PM 7/25/2024'.

## Flask structure:

**Uploads:** This folder has all .csv files.

**Templates:** This folder has all front-end files i.e .html

**Static:** This folder has all styling files for front-end i.e .css and all images that are present in front-end website.

```
php Copy code

data-analysis-visualization/
|
├─ app/
|   ├── App.py
|   ├── static/
|   │   ├── images/           # Directory for images (.png, .jpg)
|   │   └─ css/
|   │       └─ style.css
|   └─ templates/
|       ├── index.html
|       └─ plot.html
|
└─ uploads/                   # Directory to store .csv files
```

## **Conclusion:**

This project is very useful for such a user who have no understanding about data analysis and data visualization. Its interface is very simple and user-friendly. It supports all various types of analysis, making it valuable tool for data analyst. It is very efficient for handling large datasets.

**\*\*\*\*\*THANKS\*\*\*\*\***