1.In an Economic analysis, data is collected on the monthly unemployment rates of a country over many years. Use time-series decomposition to separate the unemployment data into its trend, seasonal, and residual components. Visualize and interpret each component, and discuss how the decomposition helps in understanding the cyclical behavior of unemployment and identifying any long-term changes in the unemployment rate.

1. Draw the stacked bar for given dataset.
2. Draw the Pie Plot for given dataset.
3. Draw the Grouped Bar plot for given dataset.

|  |  |  |
| --- | --- | --- |
| Month | Economic Condition | Unemployment Rate |
| Jan | Good | 10.7% |
| Feb | Good | 9.8% |
| March | Good | 10.2% |
| April | Good | 11.2 |
| May | Fair | 15.75% |
| Jun | Fair | 17.8% |
| July | Good | 19.4% |
| August | Bad | 25.6% |
| Sep | Fair | 18.6% |
| Oct | Good | !5.6% |
| Nov | Bad | 26.7% |
| Dec | Fair | 19.5% |

2. Create plots for the below dataset and analyse its efficiency

1. Draw the Mosaic Plot for given dataset.
2. Draw the Histogram Plot for given dataset.
3. Draw the Scatter plot for given dataset.

|  |  |  |
| --- | --- | --- |
| SCHOOL | GRADE LEVEL | NUMBER OF STUDENTS |
| A | Grade 1 | 25 |
| A | Grade 2 | 30 |
| A | Grade 3 | 20 |
| B | Grade 1 | 22 |
| B | Grade 2 | 28 |
| B | Grade 3 | 18 |
| C | Grade 1 | 20 |
| C | Grade 2 | 25 |
| C | Grade 3 | 15 |
| D | Grade 1 | 28 |
| D | Grade 2 | 32 |
| D | Grade 3 | 24 |

**3. Visualize the graphs**

1. Create a time series plot to visualize the relationship between temperature and precipitation.
2. Draw the Line Plot for given dataset.
3. Draw the stacked bar plot for given dataset.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date** | **Station A**  **Temperature** | **Station A**  **Precipitation** | **Station B**  **Temperature** | **Station B**  **Precipitation** |
| 01/01/2024 | 25.0 | 0.1 | 23.5 | 0.2 |
| 02/01/2024 | 24.5 | 0.0 | 22.8 | 0.3 |
| 03/01/2024 | 26.2 | 0.3 | 25.0 | 0.1 |
| 04/01/2024 | 23.8 | 0.2 | 22.5 | 0.0 |
| 05/01/2024 | 25.5 | 0.1 | 24.5 | 0.4 |
| 06/01/2024 | 23.0 | 0.4 | 21.8 | 0.2 |

4. The Internet In real Time – Take 5 years of Internet users with different varieties of browsers make the data visualized with more interactively.

1. Draw the Pie Plot for given dataset.
2. Draw the Mosaic plot for given dataset.
3. Draw the scatter plot for given dataset.

|  |  |  |
| --- | --- | --- |
| **Year** | **Browser** | **Users** |
| 2019 | Chrome | 22.7M |
| 2020 | Chrome | 25.8M |
| 2022 | Chrome | 28.7M |
| 2023 | Chrome | 30.5M |
| 2024 | Chrome | 35.2M |

5. The Most Common Jobs by State, 5 years of data about the most common jobs and depict it by year, job wise, and job seekers.

1. Draw the Pie Plot for Job seekers' data.
2. Draw the Mosaic plot for the given dataset.
3. Draw the Funnel plot for Selection dataset.

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Job Sector** | **Job Seekers Rate** | **Selection Rate** |
| 2019 | IT | 95% | 25% |
| 2020 | Government Job | 97% | 12% |
| 2022 | Customer care | 98% | 45% |
| 2023 | Bank | 82% | 20% |
| 2024 | Games | 74% | 35% |