Sardar Patel Institute of Technology,Mumbai
Department of Electronics and Telecommunication Engineering
B.E. Sem-VII- PE-IV (2024-2025)

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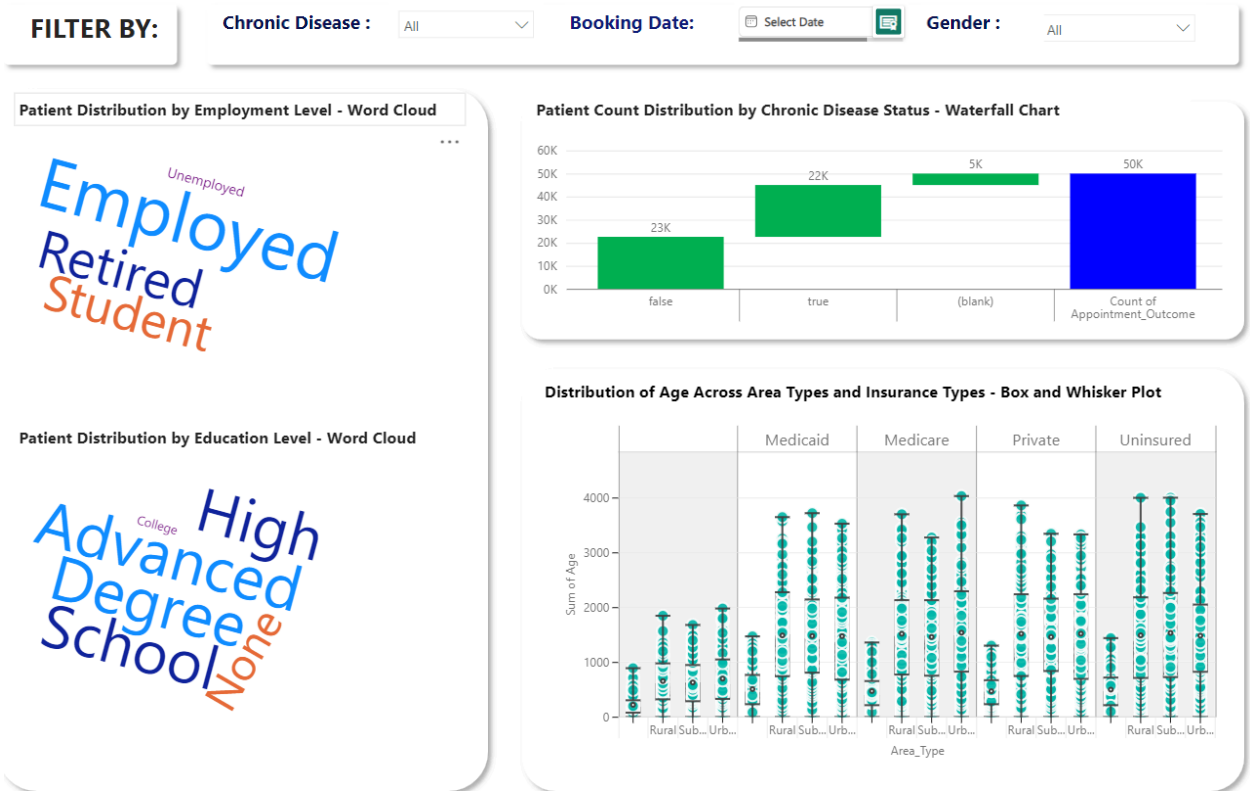
Experiment no 3

AIM: Design Interactive Dashboards and Storytelling using Tableau / Power BI / R (Shiny) / Python (Streamlit/Flask) / D3.js to be performed on the dataset - Disease spread / Healthcare

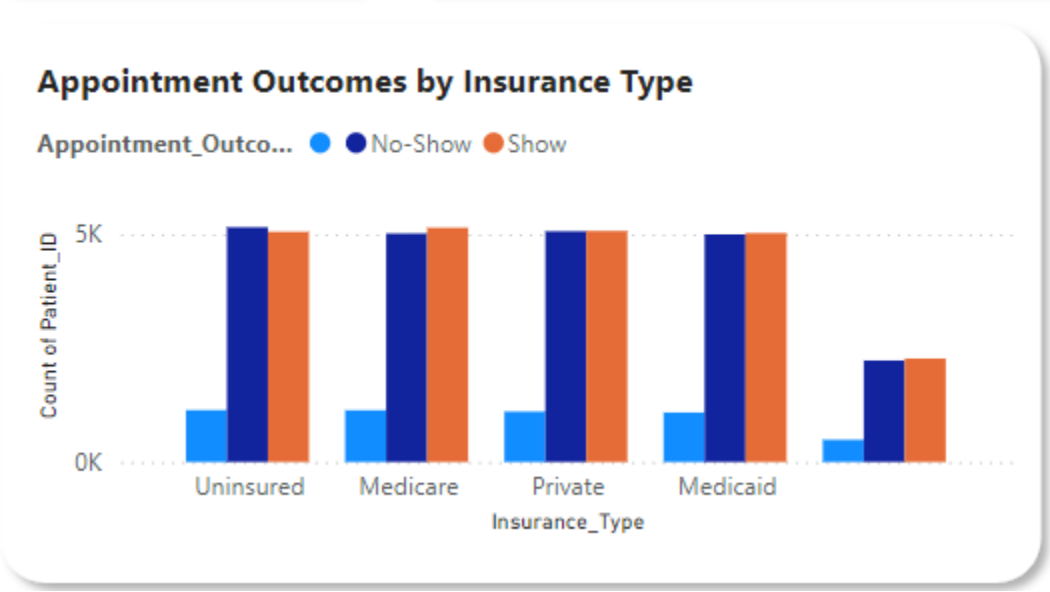
- Create interactive dashboard - Write observations from each chart given below
- (Advanced - Word chart, Box and whisker plot, Violin plot, Regression plot (linear and nonlinear), 3D chart, Jitter, Line, Area, Waterfall, Donut, Treemap, Funnel
- Basic - Bar chart, Pie chart, Histogram, Timeline chart, Scatter plot, Bubble plot)

Database:
https://www.kaggle.com/datasets/kanchana1990/colorado-healthcare-decoding-no-show-patterns

Dashboard:



Observation:



Distribution across insurance types:

- The graph shows data for four insurance types: Uninsured, Medicare, Private Insurance, and Medicaid.

- There seems to be a relatively even distribution of patients across Uninsured, Medicare, and Private Insurance categories, with Medicaid having a noticeably smaller patient count.

Appointment outcomes:

- For each insurance type, there are three outcome categories: No-Show (blue), and Show (orange).
- Across all insurance types, the number of "Show" appointments is significantly higher than "No-Show" appointments.

No-Show rates:

- The "No-Show" rate appears to be fairly consistent across all insurance types, with the blue bars being roughly the same height for each category.
- However, the Uninsured category seems to have a slightly higher "No-Show" rate compared to the other insurance types.

Show rates:

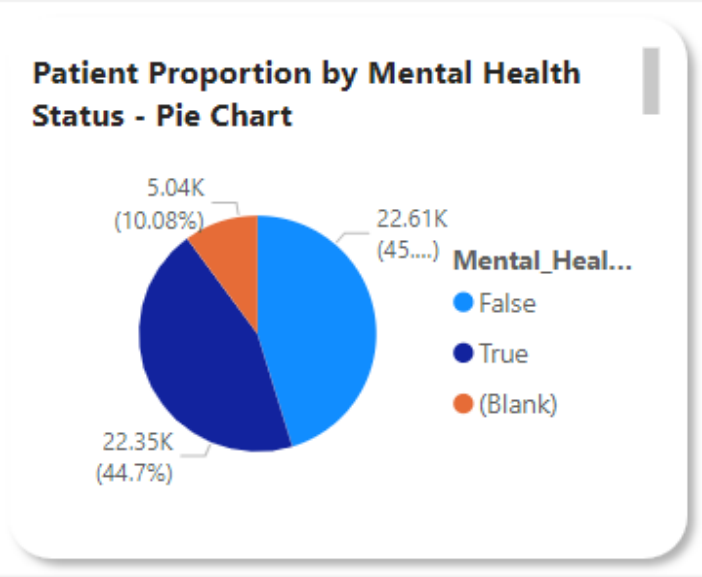
- The "Show" rates (orange bars) are consistently high across all insurance types.
- There doesn't appear to be a significant difference in "Show" rates between different insurance types.

Medicaid:

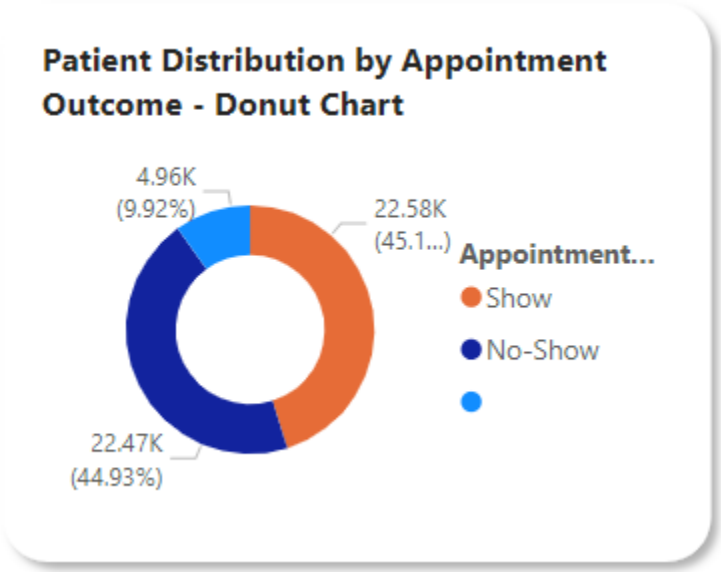
- While Medicaid has fewer total patients, the ratio of "Show" to "No-Show" appointments appears similar to other insurance types.

Overall attendance:

- Across all insurance types, the majority of appointments result in "Show" outcomes, indicating generally good attendance regardless of insurance status.

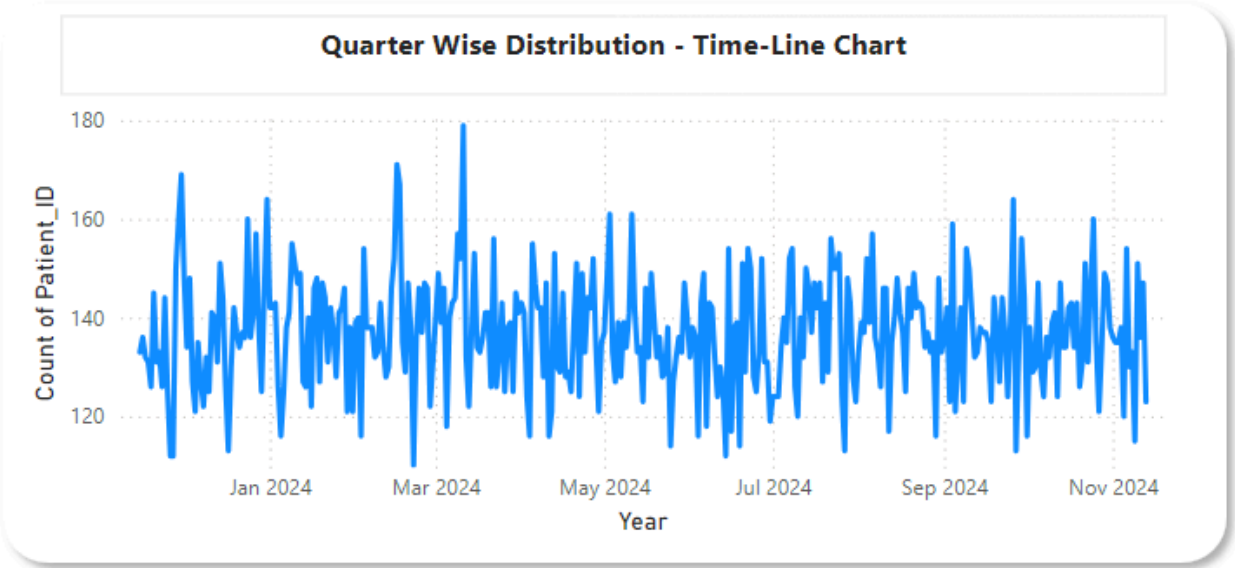


- False (No mental health issues): 22.61K patients (45.3%)
- True (Has mental health issues): 22.35K patients (44.7%)
- (Blank): 5.04K patients (10.08%)
- The proportion of patients with and without mental health issues is nearly equal, with a slight edge for those without mental health issues.
- There's a significant portion (about 10%) of patients with unspecified mental health status.
- The total patient count across all categories is approximately 50,000.



- Show: 22.58K patients (45.17%)
- No-Show: 22.47K patients (44.93%)
- Unspecified (tiny blue slice): 4.96K patients (9.92%)

- The proportion of patients who show up for appointments is very close to those who don't show up.
- There's a small percentage of appointments with an unspecified outcome.
- The total patient count is consistent with the first chart, around 50,000.



Time Range:

- The graph covers the year 2024, from January to November.

Patient Count Fluctuations:

- The count of patients (y-axis) fluctuates mostly between 120 and 160 throughout the year.
- There are occasional spikes reaching close to 180 patients.

Seasonal Patterns:

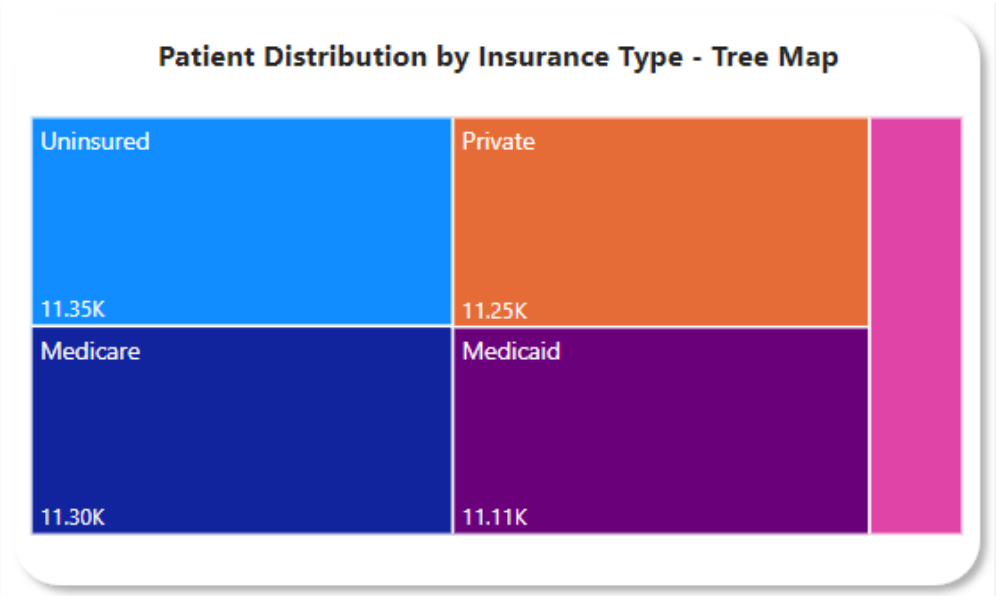
- No clear seasonal pattern is immediately apparent.
- There seems to be slightly higher volatility in the first half of the year (January to June) compared to the second half.

Overall Trend:

- The patient count appears relatively stable throughout the year, with no significant upward or downward trend.

Peak Periods:

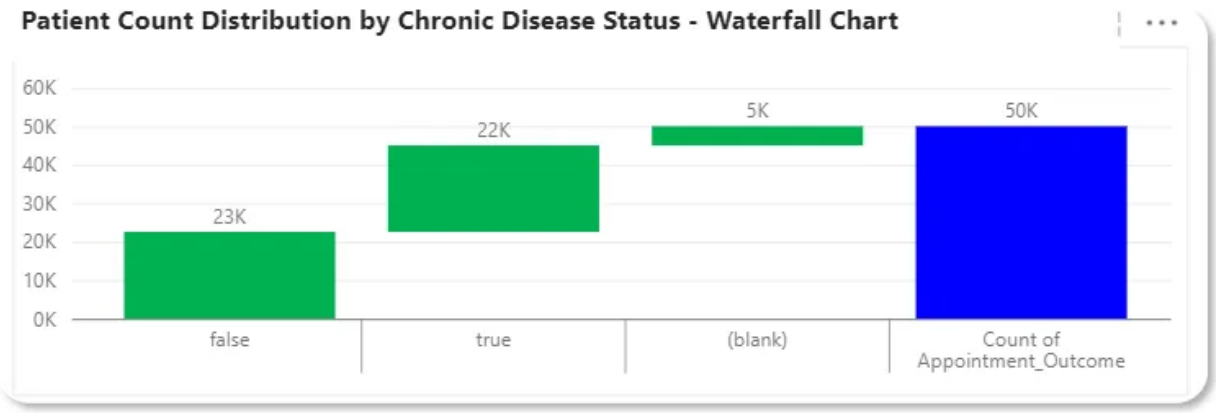
- The highest peaks occur around March and April 2024.



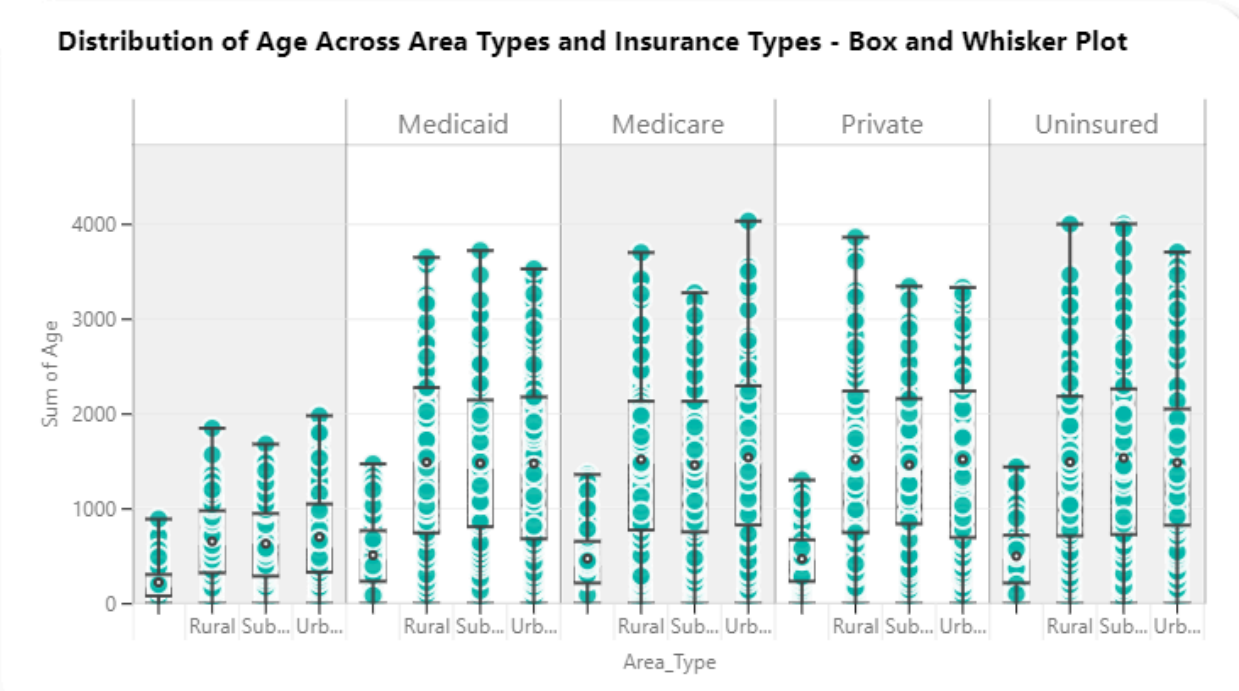
- Uninsured: 11,350 patients
- Medicare: 11.35K patients
- Private Insurance: 11.25K patients
- Medicaid: 11.11K patients
- There's a small unlabeled section, possibly representing a fifth category or unspecified insurance type.:
- The distribution of patients across insurance types is remarkably even.
- Uninsured patients form the largest group, but only by a small margin.
- Medicare and Private insurance are very close in patient numbers.
- Medicaid has slightly fewer patients but is still close to the other categories.
- The total patient count across all insurance types is approximately 45,000-46,000.

- Employed: Appears to be the largest category, suggesting it represents the highest number of patients.
- Retired: Second largest, indicating a significant portion of elderly or older patients.
- Student: Moderately sized, representing a notable portion of the patient population.
- Unemployed: Smallest word, suggesting the least number of patients in this category.
- The working population (Employed) seems to make up the majority of patients.
- There's a substantial retired population seeking healthcare services.
- The student population is significant, which could indicate a younger demographic or area with educational institutions.
- The unemployed category is present but represents the smallest group.

- High School: Largest word, suggesting it's the most common education level among patients.
- Advanced Degree: Second largest, indicating a significant portion of highly educated patients.
- College: Moderately sized, representing a notable portion of patients with college education.
- None: Smallest word, suggesting the least number of patients have no formal education.
- High school education is the most prevalent among the patient population.
- There's a surprisingly large number of patients with advanced degrees.
- College-educated patients form a substantial group but less than high school or advanced degree holders.
- A small portion of patients have no formal education.



- False (No chronic disease): 23K patients
- True (Has chronic disease): 22K patients
- (Blank): 5K patients
- Total Count of Appointment Outcome: 50K
- The number of patients without chronic diseases (23K) is slightly higher than those with chronic diseases (22K).
- There's a significant number of patients (5K) with unspecified chronic disease status.
- The total patient count across all categories is 50K, which matches the "Count of Appointment Outcome" bar.



- The graph is divided into four main sections by insurance type: Medicaid, Medicare, Private, and Uninsured.
- Each insurance type is further divided into three area types: Rural, Suburban, and Urban.
- The y-axis represents the sum of age, which likely indicates the distribution of patient ages.
- Medicare: Shows the highest median ages across all area types, which is expected as Medicare primarily serves older populations.
- Medicaid: Generally shows lower median ages compared to Medicare, but higher than Private insurance.
- Private: Displays a wide range of ages, with medians lower than Medicare and Medicaid.
- Uninsured: Shows a distribution similar to Private insurance, with wide ranges and relatively lower median ages.
- Rural areas often show slightly higher median ages across insurance types, especially noticeable in Medicare and Medicaid.
- Urban areas tend to have lower median ages, particularly visible in the Private and Uninsured categories.
- Suburban areas generally fall between Rural and Urban in terms of age distribution.
- Medicare Rural: Has the highest median age among all categories.
- Medicaid Urban: Shows the widest range of ages within the Medicaid category.
- Private Suburban: Displays a particularly wide range of ages, indicating a diverse patient population.
- Uninsured Rural: Has a notably higher median age compared to Uninsured Urban and Suburban.
- There are numerous outliers across all categories, represented by individual dots above the whiskers.
- Medicare shows fewer outliers on the upper end, likely because its population is already skewed older.
- Medicaid and Private insurance show more outliers on the upper end, especially in Urban and Suburban areas.

Conclusion :- From this experiment, I learned about how to build basic and advanced visualizations in power bi and also to create an interactive dashboard in power bi.