PROJECT REPORT

Hospital Performance & Patient Data Analytics Dashboard

1. Introduction

Healthcare organizations generate large volumes of patient data daily. Analyzing this data helps hospitals understand disease patterns, treatment costs, patient demographics, and overall performance. This project focuses on analyzing hospital patient records using data analytics tools to extract meaningful insights and visualize them through an interactive dashboard.

2. Objective of the Project

The main objectives of this project are:

- To analyze disease distribution among patients
- To compare treatment costs across conditions
- To study patient demographics based on age groups
- To evaluate treatment outcomes
- To measure patient satisfaction levels
- To visualize healthcare insights using a dashboard

3. Tools and Technologies Used

Tool	Purpose
Python (Pandas)	Data Cleaning
MySQL	Data Analysis
Tableau	Data Visualization
CSV Dataset	Data Source

4. Dataset Description

The dataset contains hospital patient records with the following attributes:

- Patient ID

- Age
- Gender
- Medical Condition
- Procedure Performed
- Treatment Cost
- Length of Stay
- Readmission Status
- Outcome
- Satisfaction Rating

Total Records: **984 patients**

5. Methodology

The project was completed in four main stages:

Step 1: Data Collection

A hospital dataset was obtained containing patient treatment details.

Step 2: Data Cleaning

Data cleaning was performed using Python to:

- Remove duplicate records
- Handle missing values
- Convert data types
- Create new fields such as age groups and cost categories

Step 3: Data Analysis

SQL queries were used to analyze:

- Most common diseases
- Average treatment costs
- Patient outcomes
- Satisfaction levels

Step 4: Data Visualization

An interactive dashboard was created using Tableau to display insights visually.

6. Dashboard Description

The dashboard includes the following visualizations:

1. Disease Distribution

Shows the number of patients affected by each medical condition.

2. Cost Analysis

Displays average treatment costs for different diseases.

3. Age Group Analysis

Shows patient distribution based on age categories.

4. Outcome Success Rate

Illustrates recovery vs stable patient outcomes.

5. Satisfaction Analysis

Shows average patient satisfaction ratings for procedures.

7. Key Insights

From the analysis, the following insights were identified:

- Cancer and Prostate Cancer treatments have the highest costs
- Most patients belong to middle-age and senior groups
- The majority of patients recovered successfully
- Certain procedures show higher satisfaction levels

8. Advantages of the Project

- Helps hospitals understand patient trends
- Improves decision-making based on data
- Identifies cost-intensive treatments
- Enhances patient satisfaction analysis

9. Limitations

- Dataset is limited to sample records
- Does not include real-time hospital data

- External factors like hospital location are not considered

10. Conclusion

This project demonstrates how data analytics can be applied in the healthcare sector to gain valuable insights. By combining data cleaning, SQL analysis, and interactive visualization, the dashboard provides a comprehensive view of hospital performance and patient outcomes. Such data-driven approaches can support better healthcare management decisions.

11. Future Scope

- Integration with real hospital databases
- Real-time data analytics
- Predictive analysis using machine learning