**Predictive Analytics for Hospital Bed Occupancy Management**

### ****Problem Statement:****

Hospitals frequently face challenges in efficiently managing their bed occupancy, especially during periods of high patient influx, such as flu season or emergencies. Overcrowding can lead to longer patient wait times, reduced quality of care, and overworked staff, while underutilized beds result in resource wastage. A lack of accurate forecasting for bed occupancy hinders hospitals from optimizing their resources, leading to inefficiencies that affect both patient care and operational costs. There is a need for a system that can predict bed occupancy trends to better manage hospital resources and improve patient outcomes.

### ****Objectives:****

1. To develop a machine learning-based predictive model that forecasts future hospital bed occupancy using historical patient admission data.
2. To analyze key factors such as patient demographics, admission trends, and seasonal variations that impact bed occupancy rates.
3. To design a web-based dashboard that visualizes predicted bed occupancy, allowing hospital administrators to make data-driven decisions for resource allocation.
4. To improve hospital operational efficiency by reducing bed shortages or under-utilization through accurate, real-time predictions.
5. To provide health-care providers with a tool to optimize resource planning, ultimately improving the patient experience and quality of care.