Hospital Readmission & Billing Insights

# Project Title

Hospital Readmission & Billing Insights for Diabetic Patients

# Goal

Analyze patient demographics, billing, conditions, medications, and admissions to uncover factors driving cost, readmission, and efficiency.

# Key Insights

1. Cost Drivers - Billing & Conditions  
- Hypertension and Diabetes are among the most frequently occurring chronic conditions.  
- These conditions are significantly associated with higher billing amounts.  
- Patients with chronic conditions had longer stays and higher average costs.

2. Age and Resource Utilization  
- Senior patients (60+) tend to have longer stays and moderate to high billing.  
- Young adults had the most cost-efficient stays.

3. Admissions Trends  
- Admissions peak in Spring and Winter, suggesting seasonal healthcare pressures.  
- Emergency admissions incur higher billing and longer stays compared to elective ones.

4. Weekend Admission Impact  
- Patients admitted on weekends tend to stay longer, likely due to reduced discharge processing.

5. Medication Cost Analysis  
- Certain medications like insulin and antibiotics are associated with higher billing per day.

6. Insurance Inequity  
- Some private insurance providers are associated with significantly higher bills.  
- Useful for contract negotiation or auditing overbilling.

# Correlation Summary

- Billing vs Length of Stay: Positively related, but billing per day decreases as stay increases.  
- No multicollinearity found among core numeric features.  
- Billing per day is a useful feature to assess patient-level cost efficiency.

# Deliverables

- Cleaned dataset with 8 new engineered features  
- 15+ visualizations covering real-world healthcare issues  
- Exportable heatmaps, charts, and downloadable insights