Here's a foundational Python project for a **Hospital Management System** with a focus on **data analysis** and **visualization**. The code uses libraries such as `pandas`, `matplotlib`, and `seaborn` to process and visualize hospital-related data.

Description of the Code

1. **Dataset**:
   - Simulated data with details like `Patient_ID`, `Age`, `Gender`, `Department`, `Days_Admitted`, and `Cost`.
2. **Analysis**:
   - Calculates average cost by department.
   - Analyzes gender distribution.
   - Groups patients into age ranges (`Age_Group`) and calculates average days admitted per group.
3. **Visualizations**:
   - **Bar Chart**: Average cost by department.
   - **Pie Chart**: Gender distribution among patients.
   - **Bar Chart**: Average days admitted by age group.
4. **Insights**:
   - Calculates cost per day for each patient.
   - Identifies the patient with the highest cost.
   - Finds the department with the maximum number of patients.

How to Extend This Project

- **Real Dataset**: Replace the simulated data with real hospital data (ensure data privacy).
- **Additional Insights**:
  - Analyze seasonal trends (admissions per month).
  - Predict future admissions using machine learning models.
- **Interactive Dashboards**: Use tools like **Plotly** or integrate with **Power BI**.