# ****Approach to the Capstone Project: Patient Encounter Cost and Risk Analysis in Healthcare Systems****

## ****1. Understanding the Project Scope****

* This project focuses on analyzing patient encounters, procedure costs, and payer coverage to identify high-cost healthcare utilization patterns and financial risks.
* Key datasets include **Encounters, Patients, Procedures, Payers, and Organizations**.
* The goal is to provide actionable insights for **financial planning, resource allocation, and patient care management**.

## ****2. Data Exploration & Preprocessing (SQL)****

* Load the dataset into a SQL database (MySQL or SQL Server).
* Use SELECT \* FROM table\_name to preview data.
* Check for missing values and inconsistencies using:
* Perform necessary **data cleaning** (handling null values, removing duplicates).

## ****3. SQL Analysis Tasks****

### ****(a) Evaluating Financial Risk by Encounter Outcome****

**Objective**: Identify high-risk ReasonCodes based on uncovered costs.

* Find the difference between TotalClaimCost and PayerCoverage.

### ****(b) Identifying Patients with Frequent High-Cost Encounters****

**Objective**: Find patients with **more than 3 encounters** in a year where each costs above **$10,000**.

### ****(c) Identifying Risk Factors Based on Demographics and Diagnosis Codes****

**Objective**: Find the top 3 **most frequent diagnosis codes** and analyze affected demographics.

### ****(d) Assessing Payer Contributions for Different Procedure Types****

**Objective**: Compare payer contributions to total claim costs across procedures.

### ****(e) Identifying Patients with Multiple Procedures Across Encounters****

**Objective**: Find patients who had multiple procedures in different encounters for the same diagnosis.

### ****(f) Analyzing Patient Encounter Duration****

**Objective**: Identify organizations with encounters exceeding **24 hours**.

## ****4. Data Visualization (Power BI / Tableau)****

Students must create dashboards covering:

1. **Encounter Cost Distribution** → Cost breakdown by **EncounterClass**.
2. **High-Cost Patient Identification** → Patients with **high healthcare utilization**.
3. **Uncovered Costs Analysis** → Contribution by **payers vs. reason codes**.
4. **Procedure Cost Trends** → How costs change over time.
5. **Geographical Analysis** → Identifying high-cost regions.

## ****5. Submission Guidelines****

Students must submit:

* **XYZ.sql** → SQL queries used for analysis.
* **XYZ.pbix / Tableau file** → Power BI or Tableau dashboard.
* Send files to **sagar@learnbay.co** before the deadline.

## ****6. Tips for Success****

* Use **JOINs** effectively to combine data from multiple tables.
* Optimize queries with **indexes and WHERE conditions**.
* Keep **visuals clean and meaningful** in Power BI/Tableau.
* Explain **findings & business implications** in a report.