

Power BI Healthcare Analytics Project – Student Task Plan

This project will help you analyze healthcare data using Power BI, covering data modeling, visualization, and insights generation. You will work with patient, doctor, hospital, appointment, and prescription data to uncover trends and provide actionable insights for hospital management.

Phase 1: Data Preparation & Modeling

Task 1: Import Data into Power BI

- ◇ Load the Patients, Doctors, Hospitals, Appointments, and Prescriptions CSV files into Power BI.
- ◇ Inspect the Power Query Editor to check for data inconsistencies.

Task 2: Clean & Transform Data

- ◇ Convert date columns (AppointmentDate, DateOfBirth) to proper date formats.
- ◇ Remove duplicates and handle missing values.
- ◇ Standardize column names for consistency.
- ◇ Extract patient age from DateOfBirth.
- ◇ Convert PrescriptionGiven from 'Yes/No' to Boolean (1/0).

Task 3: Create Data Relationships

- ◇ Establish relationships between tables:
 - - Patients → Appointments (PatientID)
 - - Doctors → Appointments (DoctorID)
 - - Appointments → Prescriptions (AppointmentID)

Task 4: Create necessary Calculated Columns & Measures (DAX)

e.g Create a Patient Age column: Patient Age = YEAR(TODAY()) - YEAR(Patients[DateOfBirth])
- other necessary metrics and measures

Phase 2: Data Visualization & Dashboard Creation

Task 5: Build Key Visuals in Power BI (include but not limited to the following)

- - Appointments trend over time (Line Chart)

- - Patient visit history (Table)
- - Doctor workload analysis (Bar Chart)

Task 6: Add Interactive Elements

- ◇ Use slicers for filtering by doctor, diagnosis, hospital, and date.
- ◇ Implement drill-through pages for deep-dive analysis.
- ◇ Add tooltip reports for additional insights.

🔗 Phase 3: Advanced Analysis & Insights Generation

Task 7: Time Intelligence Analysis – Compare Current vs. Previous Year's Appointments

- ◇ Ensure the Appointments table has a date field (AppointmentDate).
- ◇ Create a Calendar Table using DAX:

```
CalendarTable = ADDCOLUMNS(CALENDAR(DATE(2020,1,1),
DATE(2025,12,31)), 'Year', YEAR([Date]), 'Month', FORMAT([Date], 'MMM'),
'MonthYear', FORMAT([Date], 'MMM YYYY'))
```

- ◇ Establish a relationship between CalendarTable[Date] and Appointments[AppointmentDate].
- ◇ Create measures:
 - - Total Appointments = COUNT(Appointments[AppointmentID])
 - - Appointments LY = CALCULATE([Total Appointments], SAMEPERIODLASTYEAR(CalendarTable[Date]))
 - - YoY Growth % = DIVIDE([Total Appointments] - [Appointments LY], [Appointments LY], 0)

Task 10: Patient Retention Analysis – Identify Repeat vs. One-Time Patients

- ◇ Create a measure to count visits per patient:
 - Patient Visit Count = COUNT(Appointments[AppointmentID])
- ◇ Create measures to identify one-time and repeat patients:
 - - One-Time Patients = CALCULATE(DISTINCTCOUNT(Appointments[PatientID]), FILTER(Appointments, [Patient Visit Count] = 1))

- - Repeat Patients = $\text{DISTINCTCOUNT}(\text{Appointments}[\text{PatientID}]) - [\text{One-Time Patients}]$

Task 11: Anomaly Detection – Find Unusual Spikes in Diagnoses (e.g., Flu Outbreaks)

- ◇ Create a measure to count diagnoses:
- Diagnosis Count = $\text{COUNT}(\text{Appointments}[\text{AppointmentID}])$

Task 12: Geospatial Analysis – Map Patient Distribution by City/State

- ◇ Ensure the Patients table has location data (City, State, Country).
- ◇ Create a Map visualization:
- - Use a Map or Filled Map visual.
- - Drag City or State to the Location field.
- - Use PatientID (Count) as the Size of the bubble.