Part 1: SDG Selection and Problem Definition

SDG Selection: SDG 3: Good Health and Well-Being

Problem Definition: High Rates of Diabetes in Urban Areas

Diabetes is a significant health issue globally, with rising rates particularly in urban populations. The goal is to analyze demographic data, health records, and lifestyle factors to identify trends and areas in need of intervention.

Part 2: Database Design

ERD (Entity-Relationship Diagram):

Entities:

Patients (PatientID, Name, Age, Gender, City)

HealthRecords (RecordID, PatientID, Diagnosis, Medication, Date)

LifestyleFactors (FactorID, PatientID, Diet, ExerciseFrequency, SmokingStatus)

Schema (SQL Statements):

sql

CREATE TABLE Patients (

PatientID INT PRIMARY KEY,

Name VARCHAR(100),

Age INT,

Gender VARCHAR(10),

City VARCHAR(100)

);

CREATE TABLE HealthRecords (

RecordID INT PRIMARY KEY,

PatientID INT,

Diagnosis VARCHAR(100),

Medication VARCHAR(100),

Date DATE,

FOREIGN KEY (PatientID) REFERENCES Patients(PatientID)

);

CREATE TABLE LifestyleFactors (

FactorID INT PRIMARY KEY,

PatientID INT,

Diet VARCHAR(100),

ExerciseFrequency INT,

SmokingStatus VARCHAR(10),

FOREIGN KEY (PatientID) REFERENCES Patients(PatientID)

);

Sample Data:

sql

INSERT INTO Patients (PatientID, Name, Age, Gender, City) VALUES

(1, 'Alice', 34, 'Female', 'New York'),

(2, 'Bob', 45, 'Male', 'Los Angeles'),

(3, 'Charlie', 29, 'Male', 'Chicago');

INSERT INTO HealthRecords (RecordID, PatientID, Diagnosis, Medication, Date) VALUES

(1, 1, 'Diabetes', 'Metformin', '2024-01-15'),

(2, 2, 'Pre-Diabetes', 'None', '2024-02-20'),

(3, 3, 'Diabetes', 'Insulin', '2024-03-10');

INSERT INTO LifestyleFactors (FactorID, PatientID, Diet, ExerciseFrequency, SmokingStatus) VALUES

(1, 1, 'High Sugar', 2, 'No'),

(2, 2, 'Balanced', 3, 'Yes'),

(3, 3, 'High Fat', 1, 'No');

Part 3: SQL Programming

Data Retrieval:

sql

SELECT \* FROM Patients WHERE City = 'New York';

Data Analysis:

sql

SELECT AVG(Age) as AverageAge, COUNT(\*) as TotalDiabetes

FROM Patients p

JOIN HealthRecords h ON p.PatientID = h.PatientID

WHERE h.Diagnosis = 'Diabetes';

Part 4: Data Analysis Using Excel

Import Data:

Use ODBC or other data connection methods to import data from your SQL database into Excel.

Analysis:

Create a Pivot Table to summarize the average age of patients with diabetes by city.

Use charts (e.g., bar charts, pie charts) to visualize data distribution, such as the proportion of different diet types among diabetic patients.

Dashboard:

Create an interactive dashboard in Excel displaying key metrics such as the number of diabetes cases, average age, and lifestyle factors.

Part 5: Integration and Testing

Integration:

Document the steps taken to connect the SQL database with Excel, including any ODBC driver setup.

Testing:

Validate the accuracy of imported data by cross-referencing it with database queries. Ensure that calculations in the Excel dashboard reflect the correct data.

Part 6: Presentation

Pitch Deck: Create a 10-slide PowerPoint presentation covering the following:

Project Overview: Introduce the SDG and the problem being addressed.

Problem Definition: Explain the significance of diabetes in urban areas.

Database Design: Present the ERD and schema.

Data Analysis Insights: Share key findings from SQL queries.

Excel Dashboard Demonstration: Show the Excel dashboard and explain the visualizations.

Delivery: Prepare to present your pitch deck, emphasizing how your data-driven solution addresses the problem related to the chosen SDG.

Deliverables

SDG Problem Definition Document: Outline your SDG selection and problem definition.

ERD: Include a visual representation of the ERD.

SQL Scripts: Provide the SQL commands used to create the database schema and populate it with data.

Excel Workbook: Contain the data analysis and dashboard.

Integration Documentation: Describe the process of data integration.

Pitch Deck Presentation: Share the presentation link (e.g., Canva or Gamma).