Project Documentation

I. Implementation

We created a Java swing application which connects with a MySQL database mhs. This is a simple menu-driven program that anyone can easily use just by following the options and questions prompted. There are 3 main things:

- Employee and Facility Management
- Patient Management
- Management and Reporting

We implemented individual files to achieve this functionality.

II. Difficulties faced

While implementing the Java Swing application for mhs, our team encountered several challenges:

- Establishing a connection between the database and the Java application posed many initial challenges but after carefully debugging and inserting all related jar files and making the required connections we were able to run it successfully.
- User Interface and its creation was an extensive process as the input for different tables had different elements.
- Writing SQL queries in Java and implementing them following the SQL syntax was a hard job as a space or a comma was showing errors. We overcame this by carefully creating SQL queries and converting them into Java code.

III. User Guide

- We run the project on IDE, select DashboardDesign file and hit run. If we run using a terminal we need to compile all Java files and start running with DashboardDesign file.
- When the DashboardDesign starts running it provides the user with 3 options
  - Employee and Facility Management
  - Patient Management
  - Management and Reporting

1. Employee and Facility Management
    - When Employee and Facility management is selected the user is given 2 drop-downs to choose from whether he wants to {insert, update, view} from different tables given in the function requirement.
    - According to the user's choice, it will give forms if the user wants to insert or update.
    - If the user views it, it will show the data in the respective table.
    - The back button directs back to the options menu.
    - Users just need to enter details in the form and submit to insert/update the data into the form.
    - For the Update operation, we need to enter the ID of the tuple we want to update.

2. Patient Management
    - When Patient management is selected the user is given 2 drop-downs to choose from whether he wants to {insert, update, view} from different tables given in the function requirement.
    - According to the user's choice, it will give forms if the user wants to insert or update.
    - The back button directs back to the options menu.
    - Users just need to enter details in the form and submit to insert/update the data into the form.
    - For the Update operation, we need to enter the ID of the tuple we want to update.
    - Patients can only view the invoice option.

3. Management and Reporting
   This has 5 options which correspond to the given 5 operations

    - **Daily Revenue report:** For a given day, a report of the revenue (patient charges recorded) by facility, with subtotals and a total.
    - **List of appointments for a selected physician:** For a user-selected date and a user-selected physician, a list of appointments.
    - **Management and Reporting for the selected facility:** For a user-selected period (begin date and end date) and a user-selected facility, a list of appointments with details for date-time, physician, patient, and description.
    - **Highest Revenue:** For a user-selected month compute the 5 best days (in terms of total revenue) for MHS.
    - **Average daily revenue**: For a user-selected period (begin date and end date) compute the average daily revenue for each insurance company.

IV. MySQL Database creation

Creating Database:

Create Database MHS;

Use Database MHS;

Creating tables:

Create table Employee(SSN int primary key, FName Varchar(255), Minit Varchar(255), LName Varchar(255), EmpID int, Street Varchar(255), City Varchar(255), State Varchar(255), Zip int, Salary int, Hiredate Date, JobClass Varchar(255), FacID int);

Create table Other_HCP(Job_Title Varchar(255), ESSN int primary key);

Create table Doctor(Speciality Varchar(255), BC_Date Date, ESSN int primary key);

Create table Nurse(Certification Varchar(255), ESSN int primary key);

Create table Facility(FacID int primary key, Size int, FType Varchar(255), Street Varchar(255), City Varchar(255), State Varchar(255), Zip int);

Create table Admin(Job_Title Varchar(255), ESSN int primary key);

Create table Outpatient_Surgery(Room_Count int, P_code int, Descr Varchar(255), FacID int primary key);

Create table Office(Office_Count int, FacID int primary key);

Create table Patient(P_id int primary key, FName Varchar(255), Minit Varchar(255), LName Varchar(255), Street Varchar(255), City Varchar(255), State Varchar(255), Zip int, Ins_id int, ESSN int);

Create table Insurance_Company(Ins_id int primary key, Name Varchar(255), Street Varchar(255), City Varchar(255), State Varchar(255), Zip int);

Create table Invoice(Inv_id int primary key, Inv_Date Date,Inv_Amt int, Ins_id int);

Create table Invoice_Detail(Cost int, Inv_id int, ESSN int, P_id int, FacID int, Constraint PK_Invoice_Detail Primary Key (Inv_id, ESSN, P_id, FacID));

Create table Makes_Appointment(Date_Time Datetime, ESSN int, P_id int, FacID int, Constraint PK_Makes_Appointment Primary Key (ESSN, P_id, FacID, Date_Time));

Create table Treats(ESSN int, P_id int, Constraint PK_Treats Primary Key (ESSN, P_id));

Altering tables to add foreign keys:

Alter table Employee Add Foreign Key (FacID) references Facility(FacID);

Alter table Other_HCP Add Foreign Key (ESSN) references Employee(SSN);

Alter table Doctor Add Foreign Key (ESSN) references Employee(SSN);

Alter table Nurse Add Foreign Key (ESSN) references Employee(SSN);

Alter table Admin Add Foreign Key (ESSN) references Employee(SSN);

Alter table Outpatient_Surgery Add Foreign Key (FacID) references Facility(FacID);

Alter table Office Add Foreign Key (FacID) references Facility(FacID);

Alter table Patient Add Foreign Key (ESSN) references Doctor(ESSN);

Alter table Patient Add Foreign Key (Ins_id) references Insurance_company(Ins_id);

Alter table Invoice Add Foreign Key (Ins_id) references Insurance_company(Ins_id);

Alter table Invoice_Detail Add Foreign Key (Inv_id) references Invoice(Inv_id);

Alter table Invoice_Detail Add Foreign Key (ESSN) references Employee(SSN);

Alter table Invoice_Detail Add Foreign Key (FacID) references Facility(FacID);

Alter table Invoice_Detail Add Foreign Key (P_id) references Patient(P_id);

Alter table Treats Add Foreign Key (P_id) references Patient(P_id);

Alter table Treats Add Foreign Key (ESSN) references Employee(SSN);

Alter table Makes_Appointment Add Foreign Key (P_id) references Patient(P_id);

Alter table Makes_Appointment Add Foreign Key (ESSN) references Employee(SSN);

Alter table Makes_Appointment Add Foreign Key (FacID) references Facility(FacID);

Table Population Commands:

INSERT INTO Facility (FacID, Size, FType, Street, City, State, Zip)

VALUES

(1, 100, 'Hospital', '123 Main St', 'Anytown', 'California', 12345),

(2, 75, 'Clinic', '456 Elm St', 'Othertown', 'Texas', 54321),

(3, 50, 'Urgent Care', '789 Oak St', 'Anycity', 'New York', 67890),

(4, 120, 'Hospital', '321 Pine St', 'Cityville', 'Florida', 98765),

(5, 90, 'Clinic', '654 Maple St', 'Townton', 'Washington', 45678),

(6, 80, 'Urgent Care', '987 Cedar St', 'Villageville', 'Arizona', 34567),

(7, 110, 'Hospital', '741 Birch St', 'Metropolis', 'Illinois', 23456),

(8, 60, 'Clinic', '369 Walnut St', 'Hamletville', 'Michigan', 87654),

(9, 70, 'Urgent Care', '852 Ash St', 'Village town', 'Ohio', 76543),

(10, 130, 'Hospital', '159 Fir St', 'Smalltown', 'Georgia', 65432);

INSERT INTO Employee (SSN, FName, Minit, LName, EmpID, Street, City, State, Zip, Salary, Hiredate, JobClass, FacID)

VALUES

(123456789, 'John', 'D', 'Doe', 1, '123 Elm St', 'Anytown', 'California', 12345, 60000, '2022-01-15', 'Manager', 1),

(234567890, 'Jane', 'M', 'Smith', 2, '456 Oak St', 'Othertown', 'Texas', 54321, 55000, '2022-02-20', 'Nurse', 2),

(345678901, 'David', 'S', 'Johnson', 3, '789 Pine St', 'Anycity', 'New York', 67890, 70000, '2022-03-10', 'Doctor', 3),

(456789012, 'Emily', 'K', 'Williams', 4, '321 Maple St', 'Cityville', 'Florida', 98765, 50000, '2022-04-05', 'Receptionist', 4),

(567890123, 'Michael', 'A', 'Brown', 5, '654 Cedar St', 'Townton', 'Washington', 45678, 45000, '2022-05-12', 'Nurse', 5),

(678901234, 'Jessica', 'L', 'Jones', 6, '987 Birch St', 'Villageville', 'Arizona', 34567, 65000, '2022-06-18', 'Administrator', 6),

(789012345, 'Christopher', 'R', 'Garcia', 7, '741 Walnut St', 'Metropolis', 'Illinois', 23456, 60000, '2022-07-23', 'Doctor', 7),

(890123456, 'Amanda', 'E', 'Martinez', 8, '369 Ash St', 'Hamletville', 'Michigan', 87654, 55000, '2022-08-30', 'Nurse', 8),

(901234567, 'Daniel', 'J', 'Anderson', 9, '852 Fir St', 'Villagetown', 'Ohio', 76543, 70000, '2022-09-14', 'Surgeon', 9),

(987654321, 'Sarah', 'N', 'Taylor', 10, '159 Pine St', 'Smalltown', 'Georgia', 65432, 50000, '2022-10-29', 'Receptionist', 10),

(876543210, 'Emma', 'P', 'Brown', 11, '369 Elm St', 'Anytown', 'California', 12345, 55000, '2022-11-03', 'Nurse', 1),

(765432109, 'Matthew', 'Q', 'Wilson', 12, '852 Oak St', 'Othertown', 'Texas', 54321, 65000, '2022-12-18', 'Doctor', 2),

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    (654321098, 'Olivia', 'R', 'Anderson', 13, '741 Pine St', 'Anycity', 'New York', 67890, 60000, '2023-01-05', 'Nurse', 3),

    (543210987, 'James', 'S', 'Garcia', 14, '159 Maple St', 'Cityville', 'Florida', 98765, 70000, '2023-02-20', 'Surgeon', 4),

    (432109876, 'Sophia', 'T', 'Clark', 15, '654 Cedar St', 'Townton', 'Washington', 45678, 50000, '2023-03-15', 'Receptionist', 5);


INSERT INTO Doctor (Speciality, BC_Date, ESSN)

VALUES

    ('Cardiology', '1980-05-15', 345678901),

    ('Neurology', '1975-10-20', 789012345),

    ('Pediatrics', '1988-03-30', 765432109);


INSERT INTO Nurse (Certification, ESSN)

VALUES

    ('RN', 234567890),

    ('LPN', 567890123),

    ('CNA', 890123456),

    ('RN',876543210),

    ('LPN',654321098);


INSERT INTO Other_HCP (Job_Title, ESSN)

VALUES

    ('Radiology Technician', 543210987),

    ('Physical Therapist', 901234567),

    ('Receptionist', 456789012),

    ('Receptionist', 432109876);


INSERT INTO Admin (Job_Title, ESSN)

VALUES
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    ('HR Manager', 123456789),
    ('Finance Officer', 678901234),
    ('IT Front Desk', 987654321);
INSERT INTO Outpatient_Surgery (Room_Count, P_code, Descr, FacID)
VALUES
    (3, 123, 'Orthopedic', 1),
    (2, 456, 'Ophthalmology', 2),
    (4, 789, 'Dermatology', 3),
    (5, 234, 'Gastroenterology', 4),
    (3, 567, 'Urology', 5),
    (2, 890, 'ENT', 6),
    (4, 345, 'Plastic Surgery', 7),
    (5, 678, 'Podiatry', 8),
    (3, 901, 'Cardiology', 9),
    (2, 123, 'Neurology', 10);

INSERT INTO Office (Office_Count, FacID)
VALUES
    (5, 1),
    (4, 2),
    (3, 3),
    (6, 4),
    (4, 5),
    (5, 6),
    (3, 7),
    (4, 8),
    (6, 9),
    (5, 10);
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```
INSERT INTO Insurance_Company (Ins_id, Name, Street, City, State, Zip)
VALUES
    (1, 'ABC Insurance', '123 Main St', 'Anytown', 'California', 12345),
    (2, 'XYZ Insurance', '456 Elm St', 'Othertown', 'Texas', 54321),
    (3, 'DEF Insurance', '789 Oak St', 'Anycity', 'New York', 67890),
    (4, 'GHI Insurance', '321 Pine St', 'Cityville', 'Florida', 98765),
    (5, 'JKL Insurance', '654 Maple St', 'Townton', 'Washington', 45678),
    (6, 'MNO Insurance', '987 Cedar St', 'Villageville', 'Arizona', 34567),
    (7, 'PQR Insurance', '741 Birch St', 'Metropolis', 'Illinois', 23456),
    (8, 'STU Insurance', '369 Walnut St', 'Hamletville', 'Michigan', 87654),
    (9, 'VWX Insurance', '852 Ash St', 'Villagetown', 'Ohio', 76543),
    (10, 'YZA Insurance', '159 Fir St', 'Smalltown', 'Georgia', 65432);

INSERT INTO Patient (P_id, FName, Minit, LName, Street, City, State, Zip, Ins_id, ESSN)
VALUES
    (1, 'Alice', 'M', 'Smith', '123 Elm St', 'Anytown', 'California', 12345, 1, 345678901),
    (2, 'Bob', 'J', 'Johnson', '456 Oak St', 'Othertown', 'Texas', 54321, 2, 345678901),
    (3, 'Charlie', 'R', 'Williams', '789 Pine St', 'Anycity', 'New York', 67890, 3, 345678901),
    (4, 'David', 'A', 'Jones', '321 Maple St', 'Cityville', 'Florida', 98765, 4, 789012345),
    (5, 'Emma', 'B', 'Brown', '654 Cedar St', 'Townton', 'Washington', 45678, 5, 789012345),
    (6, 'Olivia', 'C', 'Garcia', '987 Birch St', 'Villageville', 'Arizona', 34567, 6, 789012345),
    (7, 'James', 'D', 'Martinez', '741 Walnut St', 'Metropolis', 'Illinois', 23456, 7, 765432109),
    (8, 'Sophia', 'E', 'Hernandez', '369 Ash St', 'Hamletville', 'Michigan', 87654, 8, 765432109),
    (9, 'Daniel', 'F', 'Young', '852 Fir St', 'Villagetown', 'Ohio', 76543, 9, 345678901),
    (10, 'Isabella', 'G', 'King', '159 Pine St', 'Smalltown', 'Georgia', 65432, 10, 765432109);
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INSERT INTO Invoice (Inv_id, Inv_Date, Inv_Amt, Ins_id)
VALUES
    (1, '2024-04-23', 200, 1),
    (2, '2024-04-22', 300, 2),
    (3, '2024-04-21', 400, 3),
    (4, '2024-04-20', 500, 4),
    (5, '2024-04-19', 600, 5),
    (6, '2024-04-18', 700, 6),
    (7, '2024-04-17', 800, 7),
    (8, '2024-04-16', 900, 8),
    (9, '2024-04-15', 1000, 9),
    (10, '2024-04-14', 1100, 10);
INSERT INTO Invoice_Detail (Cost, Inv_id, ESSN, P_id, FacID)
VALUES
    (150, 1, 345678901, 1, 1),
    (200, 2, 789012345, 2, 2),
    (250, 3, 765432109, 3, 3),
    (300, 4, 567890123, 4, 4),
    (350, 5, 890123456, 5, 5),
    (400, 6, 901234567, 6, 6),
    (450, 7, 987654321, 7, 7),
    (500, 8, 876543210, 8, 8),
    (550, 9, 654321098, 9, 9),
    (600, 10, 543210987, 10, 10);
```

```
INSERT INTO Treats (ESSN, P_id)
VALUES
    (345678901, 1),
    (789012345, 2),
    (765432109, 3),
    (567890123, 4),
    (890123456, 5),
    (901234567, 6),
    (987654321, 7),
    (876543210, 8),
    (654321098, 9),
    (543210987, 10);

INSERT INTO Makes_Appointment (Date_Time, ESSN, P_id, FacID)
VALUES
    ('2024-04-23 09:00:00', 345678901, 1, 1),
    ('2024-04-24 10:30:00', 789012345, 2, 2),
    ('2024-04-25 11:15:00', 765432109, 3, 3),
    ('2024-04-26 13:45:00', 567890123, 4, 4),
    ('2024-04-27 14:30:00', 890123456, 5, 5),
    ('2024-04-28 15:20:00', 901234567, 6, 6),
    ('2024-04-29 16:10:00', 987654321, 7, 7),
    ('2024-04-30 17:00:00', 876543210, 8, 8),
    ('2024-05-01 08:30:00', 654321098, 9, 9),
    ('2024-05-02 09:45:00', 543210987, 10, 10);
```