Coding Challenge: Hospital Management System

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- **Modules Implementation**

  - **Patient Management**
    Patient registration with details like name, age, gender, and contact information.
    View, update, and delete patient records.

  - **Doctor Management**
    Register and manage doctors with specialization, experience, and availability.
    List doctors by specialization.

  - **Appointment Scheduling**
    Book, view, and cancel appointments between patients and doctors.
    Check availability of doctors before booking.

  - **Treatment Record**
    Add treatment details after appointments.
    Maintain history of treatments for each patient.

- **Technologies Used**
  - Programming Language: Java
  - Database: MySQL
  - IDE: Eclipse
  - Design Pattern: DAO (Data Access Object)

- **DAO Interfaces & Implementations**
  - HospitalService & HospitalServiceImpl
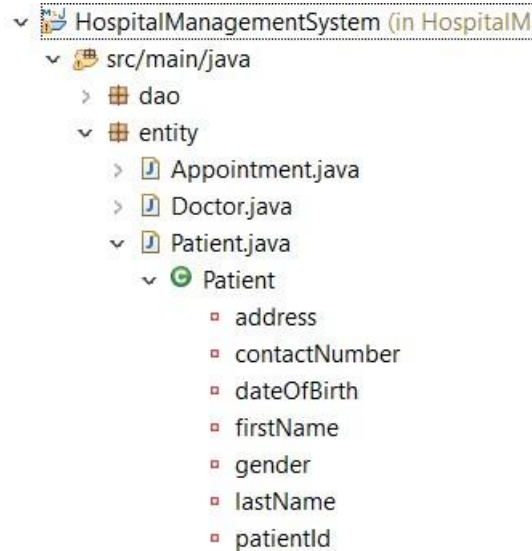
- **Exception Handling**
  - Custom exceptions created:
  - PatientNotFoundException
  - DoctorNotFoundException
  - AppointmentNotFoundException
  - Used try-catch blocks to handle SQL and input errors gracefully.

- **Utility Classes**
  - DBConnectionUtil – Manages database connections.
  - ValidationUtil – Input validations.
  - DateUtil – Formats and parses date inputs.

1. Define `Patient` class with the following confidential attributes:
   a. patientId
   b. firstName
   c. lastName;
   d. dateOfBirth
   e. gender
   f. contactNumber
   g. address

```
v 🖳 HospitalManagementSystem (in HospitalM
  v 🛢 src/main/java
    > ⊞ dao
    v ⊞ entity
      > 🗋 Appointment.java
      > 🗋 Doctor.java
      v 🗋 Patient.java
        v ⊕ Patient
            ▫ address
            ▫ contactNumber
            ▫ dateOfBirth
            ▫ firstName
            ▫ gender
            ▫ lastName
            ▫ patientId
```
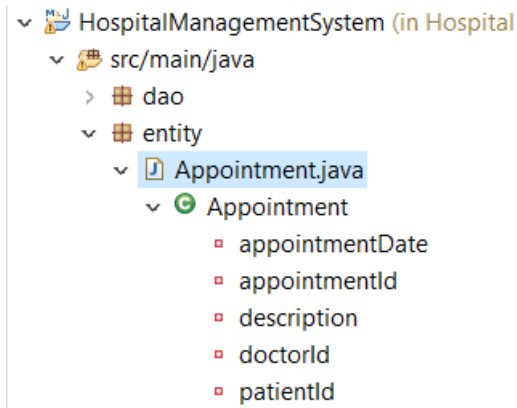
2. Define 'Doctor` class with the following confidential attributes:
   a. doctorId
   b. firstName
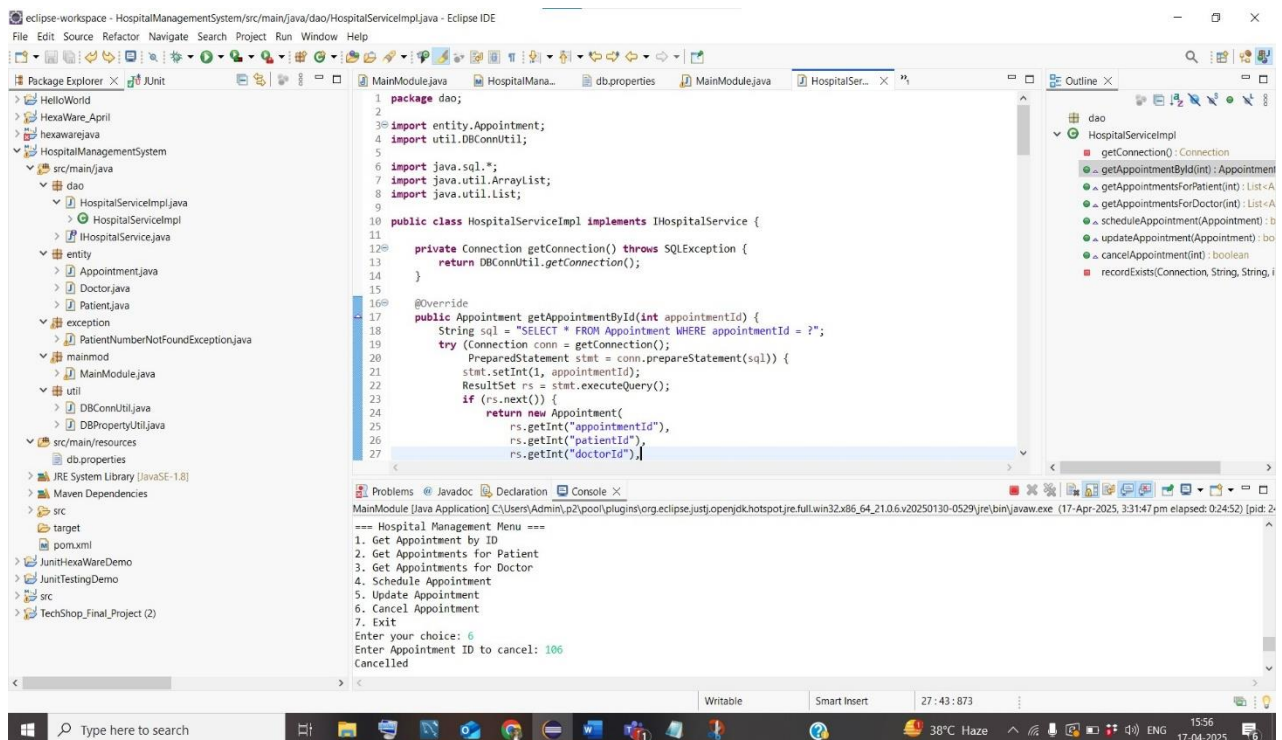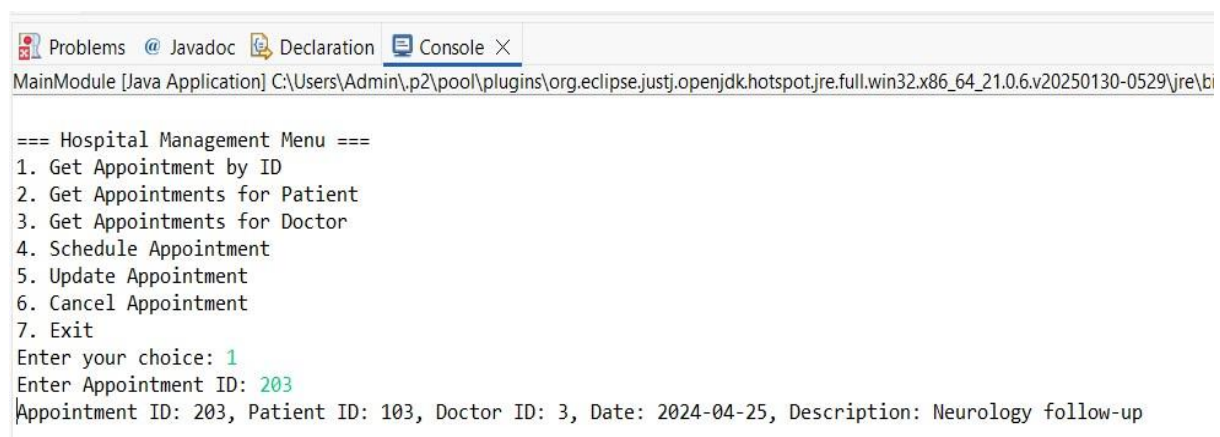   c. lastName
   d. specialization
   e. contactNumber

```
v 🖳 HospitalManagementSystem (in HospitalMar
  v 🛢 src/main/java
    > ⊞ dao
    v ⊞ entity
      > 🗋 Appointment.java
      v 🗋 Doctor.java
        v ⊕ Doctor
            ▫ contactNumber
            ▫ doctorId
            ▫ firstName
            ▫ lastName
            ▫ specialization
```

3. Appointment Class:
   a. appointmentId
   b. patientId
   c. doctorId
   d. appointmentDate
   e. description

- **Project Outputs:**

- **Get Appointment by ID**


```
=== Hospital Management Menu ===
1. Get Appointment by ID
2. Get Appointments for Patient
3. Get Appointments for Doctor
4. Schedule Appointment
5. Update Appointment
6. Cancel Appointment
7. Exit
Enter your choice: 1
Enter Appointment ID: 203
Appointment ID: 203, Patient ID: 103, Doctor ID: 3, Date: 2024-04-25, Description: Neurology follow-up
```

- **Get Appointment by ID**

```
=== Hospital Management Menu ===
1. Get Appointment by ID
2. Get Appointments for Patient
3. Get Appointments for Doctor
4. Schedule Appointment
5. Update Appointment
6. Cancel Appointment
7. Exit
Enter your choice: 2
Enter Patient ID: 102
Appointment ID: 105, Patient ID: 102, Doctor ID: 3, Date: 2025-05-08, Description: Normal Checkup
Appointment ID: 202, Patient ID: 102, Doctor ID: 2, Date: 2024-04-22, Description: Pediatric consultation
```

- **Get Appointments for Doctor**

```
=== Hospital Management Menu ===
1. Get Appointment by ID
2. Get Appointments for Patient
3. Get Appointments for Doctor
4. Schedule Appointment
5. Update Appointment
6. Cancel Appointment
7. Exit
Enter your choice: 3
Enter Doctor ID: 3
Appointment ID: 105, Patient ID: 102, Doctor ID: 3, Date: 2025-05-08, Description: Normal Checkup
Appointment ID: 203, Patient ID: 103, Doctor ID: 3, Date: 2024-04-25, Description: Neurology follow-up
```

- **Schedule Appointment**

```
=== Hospital Management Menu ===
1. Get Appointment by ID
2. Get Appointments for Patient
3. Get Appointments for Doctor
4. Schedule Appointment
5. Update Appointment
6. Cancel Appointment
7. Exit
Enter your choice: 4
Enter Appointment ID: 106
Enter Patient ID: 102
Enter Doctor ID: 2
Enter Date: 2025-07-10
Enter Description: blood test
Scheduled
```

- **Update Appointment**

```
=== Hospital Management Menu ===
1. Get Appointment by ID
2. Get Appointments for Patient
3. Get Appointments for Doctor
4. Schedule Appointment
5. Update Appointment
6. Cancel Appointment
7. Exit
Enter your choice: 5
Enter Appointment ID to Update: 106
Enter new Patient ID: 102
Enter new Doctor ID: 2
Enter new Date: 2025-11-12
Enter new Description: x-ray
Updated
```

- **Cancel Appointment**

```
=== Hospital Management Menu ===
1. Get Appointment by ID
2. Get Appointments for Patient
3. Get Appointments for Doctor
4. Schedule Appointment
5. Update Appointment
6. Cancel Appointment
7. Exit
Enter your choice: 6
Enter Appointment ID to cancel: 106
Cancelled
```