HireSmart CRM - Project Document

Github Link Repo: https://github.com/jyotiraditya0607/HireSmart-CRM

Notion Link: https://www.notion.so/215402dcc41d80478d1ffa6f8212e5f4? source=copy_link

1. Sprint Goal

In this Sprint, we focused primarily on the backend system for the recruitment platform. This involved designing the overall data model, implementing object-oriented structures, connecting with the database, and preparing for real-time application workflows like candidate-job matching, resume uploads, and interview tracking.

User Stories:

Jira Tool Burndown chart:

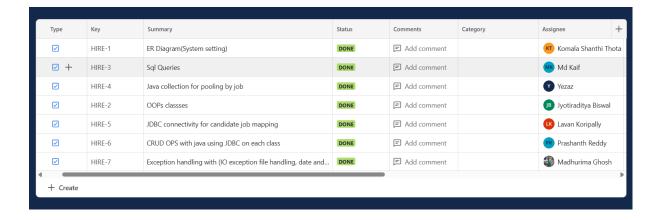


Fig.1: users assign with each task

User Story 1: ER Diagram Design

As a system architect,

I want to design a normalized ER diagram for the core entities (Candidate, J ob, Interview, Recruiter),

so that the database structure is clear, scalable, and supports all recruitme nt operations.

User Story 2: OOP Class Implementation As a backend developer,

I want to implement Java classes for Candidate and Job using interfaces an d inheritance,

so that the codebase is modular, reusable, and follows OOP best practices.

User Story 3: SQL & CRUD Operations

As a database engineer,

I want to write SQL scripts and implement CRUD operations for Candidate a nd Job entities,

so that data can be created, read, updated, and deleted efficiently in the Or acle database.

User Story 4: Applicant Pool Management

As a recruiter,

I want to use Java collections and generics to manage pools of candidates for each job,

so that I can easily view, shortlist, and manage applicants for specific job p ostings.

User Story 5: JDBC Integration for Candidate-Job Mapping

As a software integrator,

I want to integrate Java JDBC to map candidates to jobs and perform datab ase operations,

so that the application can persist and retrieve candidate-job relationships r eliably.

User Story 6: Exception Handling, File I/O, and Interview Scheduling As a system maintainer,

I want to add exception handling, file I/O for resume uploads, and date/time management for interview logs,

so that the system is robust, can handle errors gracefully, and supports real-world recruitment workflows.

2. Project Purpose and Scope

Purpose:

The primary purpose of the HireSmart CRM is to streamline and manage the core activities of a recruitment agency or internal HR department. It provides

functionalities to keep track of recruiters, available job positions, potential candidates, their applications, and scheduled interviews.

Scope:

The current scope of the project includes:

- Managing core entities: Recruiters, Jobs, Candidates, and Interviews.
- Performing standard CRUD (Create, Read, Update, Delete) operations for each managed entity via a command-line interface.
- Storing data persistently in an Oracle database.
- Applying basic OOP principles and the DAO pattern.
- Handling dates and basic file path storage (for resumes).

Out of Scope:

- A graphical user interface (GUI).
- Advanced features like reporting, analytics, automated candidate matching, email notifications, integration with external systems, or user authentication/authorization.
- Complex error recovery or robust validation beyond basic input types.

3. Features

The HireSmart CRM offers the following key features:

Recruiter Management:

- Add new recruiters with details like name, email, phone, expertise, and active status.
- View a list of all recruiters.
- Update existing recruiter details.
- Delete recruiters.

Job Management:

- Post new job openings, linking them to a recruiter. Includes details like title, description, requirements, location, salary range, and posted date.
- View a list of all job postings.
- Update existing job details.

Delete job postings.

Candidate Management:

- Add new candidates with personal details, skills, experience, resume file path, and status.
- View a list of all candidates.
- Update existing candidate details.
- Delete candidates.

Interview Management:

- Schedule interviews linking a candidate, a job, and a recruiter. Includes date, time, and status.
- View a list of all scheduled interviews.
- Update interview details, including status, feedback, and rating.
- Delete scheduled interviews.
- Application Management (Implicit/Database Layer): While not directly exposed in the Main CLI menu, the database schema includes an APPLICATION table to track candidate applications to specific jobs, indicating the intended relationship. The provided code does not expose CRUD for Applications directly through the main menu, but the structure supports it.
- **Menu-driven Interface:** An interactive command-line menu simplifies navigation and access to different management functionalities.
- **Data Persistence:** All data is stored in an Oracle database, ensuring data integrity and persistence across application sessions.

4. Technologies Used

- Programming Language: Java 8+
- Database: Oracle Database
- Database Connectivity: JDBC (Java Database Connectivity)
- Design Patterns: Data Access Object (DAO), Object-Oriented Programming (OOP)

5. Architecture and Design

The application follows a layered architecture:

- Presentation Layer (CLI): Handled by the Main class, which provides the
 user interface (command-line menu), takes user input, and orchestrates
 calls to the service/DAO layer.
- Service/Business Logic Layer (Implicit): The Main class contains some direct logic for handling user input and calling DAOs. A dedicated service layer could be introduced in a larger application for more complex business rules.
- Data Access Layer (DAO): Comprises the dao package (RecruiterDAO, JobDAO, CandidateDAO, InterviewDAO). These classes are responsible for all database interactions (CRUD operations) for their respective entities, abstracting the database details from the business logic. DBConnection manages the database connection pool or single connection.
- Model Layer: The model package contains Plain Old Java Objects (POJOs) representing the database entities (Recruiter, Job, Candidate, Interview, Application). These classes hold the data and may include basic getter/setter methods. An Entity interface and Person abstract class demonstrate OOP principles.
- **Utility Layer:** The util package (DateUtil , FileUtil) provides helper functions for common tasks like date formatting/parsing or simulating file operations (like resume handling).

The **DAO Pattern** is central to the design, separating data persistence logic from the rest of the application. The **OOP Design** uses inheritance (Candidate and Recruiter potentially extending Person, though Person seems unused in the provided code excerpt) and interfaces (Entity) for structure and potential future extensibility.

6. Database Design

The database schema is designed to store information about Recruiters, Jobs, Candidates, their Applications, and Interviews. The relationships are based on the Entity-Relationship Diagram (ERD).

6.1 Entity-Relationship Diagram (ERD)

```
erDiagram
  CANDIDATE | -- o{ APPLICATION : applies
  JOB | -- o{ APPLICATION : has
  RECRUITER | -- o{ JOB : posts
  CANDIDATE | -- o { INTERVIEW : attends
  JOB ||--o{ INTERVIEW : for
  RECRUITER | -- o{ INTERVIEW : conducts
  CANDIDATE {
    int candidate_id PK
    string name
    string email
    string phone
    string skills
    int experience_years
    string resume_file_path
    string status
    date created_date
  }
  JOB {
    int job_id PK
    int recruiter_id FK
    string title
    string description
    string requirements
    string location
    double salary_min
    double salary_max
    string feedback
    date posted_date
  }
  RECRUITER {
    int recruiter_id PK
    string name
    string email
    string expertise
    string phone
    string active_status
  }
```

```
APPLICATION {
  int application_id PK
  int candidate_id FK
  int job_id FK
  date application_date
  string status
}
INTERVIEW {
  int interview_id PK
  int candidate_id FK
  int job_id FK
  int recruiter_id FK
  date interview_date
  string interview_time
  string status
  string feedback
  int rating
}
```

6.2 Schema Details

The database consists of the following tables:

RECRUITER

Column Name	Туре	Constraints
recruiter_id	NUMBER	PK
name	VARCHAR2	
email	VARCHAR2	UNIQUE
expertise	VARCHAR2	
phone	VARCHAR2	
active_status	VARCHAR2	CHECK ('ACTIVE', 'INACTIVE')

CANDIDATE

Column Name	Туре	Constraints
candidate_id	NUMBER	PK

name	VARCHAR2	
email	VARCHAR2	UNIQUE
phone	VARCHAR2	
skills	VARCHAR2	
experience_years	NUMBER	
resume_file_path	VARCHAR2	
status	VARCHAR2	CHECK ('ACTIVE', 'INACTIVE', 'HIRED')
created_date	DATE	DEFAULT SYSDATE

JOB

Column Name	Туре	Constraints
job_id	NUMBER	PK
recruiter_id	NUMBER	FK → RECRUITER(recruiter_id)
title	VARCHAR2	
description	CLOB	
requirements	VARCHAR2	
location	VARCHAR2	
salary_min	NUMBER	
salary_max	NUMBER	
feedback	VARCHAR2	
posted_date	DATE	DEFAULT SYSDATE

APPLICATION

Column Name	Туре	Constraints
application_id	NUMBER	PK
candidate_id	NUMBER	FK → CANDIDATE(candidate_id), UNIQUE with job_id
job_id	NUMBER	FK → JOB(job_id), UNIQUE with candidate_id
application_date	DATE	DEFAULT SYSDATE
status	VARCHAR2	CHECK ('APPLIED', 'SHORTLISTED', 'REJECTED', 'HIRED')

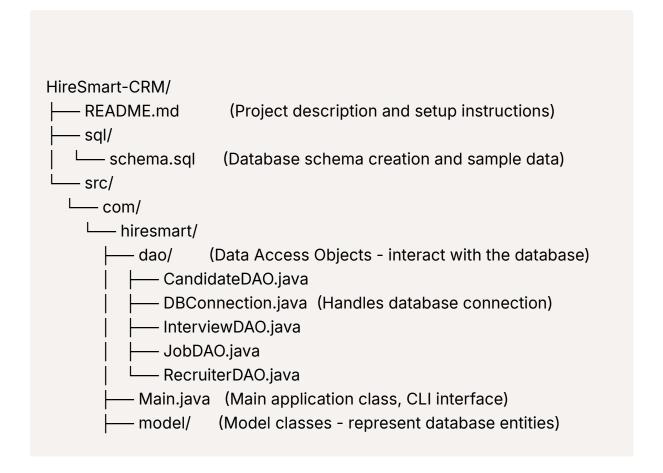
INTERVIEW

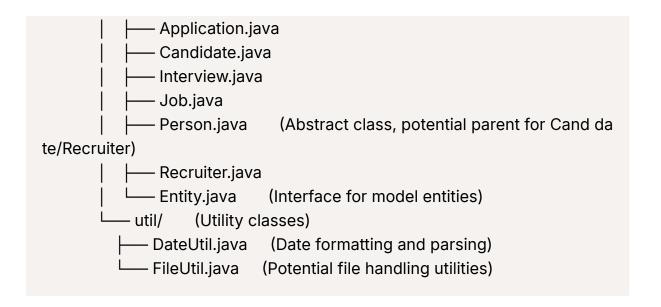
Column Name	Туре	Constraints
interview_id	NUMBER	PK
candidate_id	NUMBER	FK → CANDIDATE(candidate_id)
job_id	NUMBER	FK → JOB(job_id)
recruiter_id	NUMBER	FK → RECRUITER(recruiter_id)
interview_date	DATE	
interview_time	VARCHAR2	
status	VARCHAR2	CHECK ('SCHEDULED', 'COMPLETED', 'CANCELLED', 'RESCHEDULED')
feedback	VARCHAR2	
rating	NUMBER	CHECK BETWEEN 1 AND 10

Sequences: Oracle sequences

(recruiter_seq, candidate_seq, job_seq, application_seq, interview_seq) are used to generate unique primary key values for each table.

7. Code Structure





8. Setup and Installation

To set up and run the HireSmart CRM, follow these steps:

1. Database Setup:

- Ensure you have access to an Oracle database instance.
- Connect to your Oracle database using a database client (e.g., SQL Developer, SQL*Plus).
- Execute the SQL script located at sql/schema.sql. This script will create the necessary tables, sequences, and insert sample data.

2. Java Development Kit (JDK):

Make sure you have Java 8 or a higher version installed on your system.

3. Oracle JDBC Driver:

Download the appropriate Oracle JDBC driver JAR file
 (e.g., ojdbc8.jar for Java 8). Place this JAR file in a convenient location.

4. Configure Database Connection:

- Open the src/com/hiresmart/dao/DBConnection.java file.
- Update the database connection URL, username, and password variables within this file to match your Oracle database configuration.

5. Compilation:

Open a terminal or command prompt.

- Navigate to the root directory of the project (HireSmart-CRM/).
- Compile the Java source files, including the JDBC driver in the classpath. Replace ojdbc8.jar with the actual name and path of your driver file if necessary.

```
javac -cp ".:path/to/your/ojdbc8.jar" src/com/hiresmart/**/*.java
# On Windows, use a semicolon (;) instead of a colon (:)
# javac -cp ".;path\to\your\ojdbc8.jar" src/com/hiresmart/**/*.java
```

6. Execution:

 After successful compilation, run the main application class, again including the JDBC driver and the compiled classes (or source directory) in the classpath.

```
java -cp ".:path/to/your/ojdbc8.jar:src" com.hiresmart.Main
# On Windows
# java -cp ".;path\to\your\ojdbc8.jar;src" com.hiresmart.Main
```

9. Usage

- --- HireSmart CRM ---
- 1. Manage Recruiters
- 2. Manage Jobs
- 3. Manage Candidates
- 4. Manage Interviews
- 5. Exit

Choose an option: 1

- --- Manage Recruiters ---
- 1. Add Recruiter
- 2. View All Recruiters
- 3. Update Recruiter
- 4. Delete Recruiter
- 5. Back to Main Menu

Choose an option: 1

Enter Name: John Smith

Enter Email: john.smith@hiresmart.com

Enter Phone: 9876543210

Enter Expertise: IT Recruitment Recruiter added successfully!

- --- Manage Recruiters ---
- 1. Add Recruiter
- 2. View All Recruiters
- 3. Update Recruiter
- 4. Delete Recruiter
- 5. Back to Main Menu

Choose an option: 2

--- All Recruiters ---

Recruiter{recruiterId=1, name='John Smith', email='john.smith@hiresmart.c om', phone='9876543210', expertise='IT Recruitment', activeStatus='ACTIV E'}

- --- Manage Recruiters ---
- 1. Add Recruiter
- 2. View All Recruiters
- 3. Update Recruiter
- 4. Delete Recruiter
- 5. Back to Main Menu

Choose an option: 5

- --- HireSmart CRM ---
- 1. Manage Recruiters
- 2. Manage Jobs
- 3. Manage Candidates
- 4. Manage Interviews
- 5. Exit

Choose an option: 2

- --- Manage Jobs ---
- 1. Add Job
- 2. View All Jobs
- 3. Update Job

4. Delete Job

5. Back to Main Menu

Choose an option: 1

Enter Title: Java Developer

Enter Description: Develop enterprise applications using Java

Enter Requirements: Java, Spring Boot, Oracle DB

Enter Location: Bangalore

Enter Minimum Salary: 600000 Enter Maximum Salary: 900000

Enter Recruiter ID: 1

Job added successfully!

- --- Manage Jobs ---
- 1. Add Job
- 2. View All Jobs
- 3. Update Job
- 4. Delete Job
- 5. Back to Main Menu

Choose an option: 2

--- All Jobs ---

Job{jobId=1, recruiterId=1, title='Java Developer', description='Develop ent erprise applications using Java', requirements='Java, Spring Boot, Oracle D B', location='Bangalore', salaryMin=600000.0, salaryMax=900000.0, feedb ack='null', postedDate=2024-07-01}

- --- Manage Jobs ---
- 1. Add Job
- 2. View All Jobs
- 3. Update Job
- 4. Delete Job
- 5. Back to Main Menu

Choose an option: 5

- --- HireSmart CRM ---
- 1. Manage Recruiters
- 2. Manage Jobs
- 3. Manage Candidates

- 4. Manage Interviews
- 5. Exit

- --- Manage Candidates ---
- 1. Add Candidate
- 2. View All Candidates
- 3. Update Candidate
- 4. Delete Candidate
- 5. Back to Main Menu

Choose an option: 1

Enter Name: Alice Wilson

Enter Email: alice.wilson@email.com

Enter Phone: 9123456789

Enter Skills: Java, Spring, Oracle

Enter Experience Years: 3

Enter Resume File Path: /path/to/alice_resume.pdf

Candidate added successfully!

- --- Manage Candidates ---
- 1. Add Candidate
- 2. View All Candidates
- 3. Update Candidate
- 4. Delete Candidate
- 5. Back to Main Menu

Choose an option: 2

--- All Candidates ---

Candidate{candidateId=1, name='Alice Wilson', email='alice.wilson@email.com', phone='9123456789', skills='Java, Spring, Oracle', experienceYears=3, resumeFilePath='/path/to/alice_resume.pdf', status='ACTIVE', createdDate=2024-07-01}

- --- Manage Candidates ---
- 1. Add Candidate
- 2. View All Candidates
- 3. Update Candidate
- 4. Delete Candidate

5. Back to Main Menu

Choose an option: 5

- --- HireSmart CRM ---
- 1. Manage Recruiters
- 2. Manage Jobs
- 3. Manage Candidates
- 4. Manage Interviews
- 5. Exit

Choose an option: 4

- --- Manage Interviews ---
- 1. Schedule Interview
- 2. View All Interviews
- 3. Update Interview
- 4. Delete Interview
- 5. Back to Main Menu

Choose an option: 1

Enter Candidate ID: 1

Enter Job ID: 1

Enter Recruiter ID: 1

Enter Interview Date (YYYY-MM-DD): 2024-07-10

Enter Interview Time: 10:00 AM Interview scheduled successfully!

- --- Manage Interviews ---
- 1. Schedule Interview
- 2. View All Interviews
- 3. Update Interview
- 4. Delete Interview
- 5. Back to Main Menu

Choose an option: 2

--- All Interviews ---

Interview{interviewId=1, candidateId=1, jobId=1, recruiterId=1, interviewDat e=2024-07-10, interviewTime='10:00 AM', status='SCHEDULED', feedback ='null', rating=0}

- --- Manage Interviews ---
- 1. Schedule Interview
- 2. View All Interviews
- 3. Update Interview
- 4. Delete Interview
- 5. Back to Main Menu

Enter Interview ID to update: 1

Enter new Interview Date (current: 2024-07-10): 2024-07-12

Enter new Interview Time (current: 10:00 AM): 11:00 AM
Enter new Status (current: SCHEDULED): COMPLETED

Enter Feedback: Excellent technical skills, recommended for hire.

Enter Rating (1-10): 9

Interview updated successfully!

- --- Manage Interviews ---
- 1. Schedule Interview
- 2. View All Interviews
- 3. Update Interview
- 4. Delete Interview
- 5. Back to Main Menu

Choose an option: 2

--- All Interviews ---

Interview{interviewId=1, candidateId=1, jobId=1, recruiterId=1, interviewDat e=2024-07-12, interviewTime='11:00 AM', status='COMPLETED', feedback ='Excellent technical skills, recommended for hire.', rating=9}

- --- Manage Interviews ---
- 1. Schedule Interview
- 2. View All Interviews
- 3. Update Interview
- 4. Delete Interview
- 5. Back to Main Menu

Choose an option: 5

- --- HireSmart CRM ---
- 1. Manage Recruiters

```
2. Manage Jobs
```

- 3. Manage Candidates
- 4. Manage Interviews
- 5. Exit

Exiting...

update and delete operations

```
--- HireSmart CRM ---
1. Manage Recruiters
2. Manage Jobs
3. Manage Candidates
4. Manage Interviews
5. Exit
Choose an option: 1
--- Manage Recruiters ---
1. Add Recruiter
2. View All Recruiters
3. Update Recruiter
4. Delete Recruiter
5. Back to Main Menu
Choose an option: 3
Enter Recruiter ID to update: 1
Enter new Name (current: John Smith): John S. Smith
Enter new Email (current: john.smith@hiresmart.com): john.smith@hiresmart.c
Enter new Phone (current: 9876543210): 9876543211
Enter new Expertise (current: IT Recruitment): IT & Tech Recruitment
Enter new Status (current: ACTIVE): ACTIVE
Recruiter updated successfully!
--- Manage Recruiters ---
1. Add Recruiter
```

- 2. View All Recruiters
- 3. Update Recruiter
- 4. Delete Recruiter
- 5. Back to Main Menu

--- All Recruiters ---

Recruiter{recruiterId=1, name='John S. Smith', email='john.smith@hiresmart.com

- --- Manage Recruiters ---
- 1. Add Recruiter
- 2. View All Recruiters
- 3. Update Recruiter
- 4. Delete Recruiter
- 5. Back to Main Menu

Choose an option: 4

Enter Recruiter ID to delete: 1

Recruiter deleted successfully!

- --- Manage Recruiters ---
- 1. Add Recruiter
- 2. View All Recruiters
- 3. Update Recruiter
- 4. Delete Recruiter
- 5. Back to Main Menu

Choose an option: 2

--- All Recruiters ---

(no output, list is empty if you deleted the only recruiter)

- --- HireSmart CRM ---
- 1. Manage Recruiters
- 2. Manage Jobs
- 3. Manage Candidates
- 4. Manage Interviews
- 5. Exit

Choose an option: 2

```
--- Manage Jobs ---
1. Add Job
2. View All Jobs
3. Update Job
4. Delete Job
5. Back to Main Menu
Choose an option: 3
Enter Job ID to update: 1
Enter new Title (current: Java Developer): Senior Java Developer
Enter new Description (current: Develop enterprise applications using Java): L
Enter new Requirements (current: Java, Spring Boot, Oracle DB): Java, Spring
Enter new Location (current: Bangalore): Bangalore
Enter new Minimum Salary (current: 600000.0): 800000
Enter new Maximum Salary (current: 900000.0): 1200000
Enter new Recruiter ID (current: 1): 1
Job updated successfully!
--- Manage Jobs ---
1. Add Job
2. View All Jobs
3. Update Job
4. Delete Job
5. Back to Main Menu
Choose an option: 2
--- All Jobs ---
Job{jobId=1, recruiterId=1, title='Senior Java Developer', description='Lead Ja
--- Manage Jobs ---
1. Add Job
2. View All Jobs
3. Update Job
4. Delete Job
5. Back to Main Menu
Choose an option: 4
Enter Job ID to delete: 1
Job deleted successfully!
```

```
--- Manage Jobs ---
1. Add Job
2. View All Jobs
3. Update Job
4. Delete Job
5. Back to Main Menu
Choose an option: 2
--- All Jobs ---
(no output, list is empty if you deleted the only job)
--- HireSmart CRM ---

    Manage Recruiters

2. Manage Jobs
3. Manage Candidates
4. Manage Interviews
5. Exit
Choose an option: 3
--- Manage Candidates ---
1. Add Candidate
2. View All Candidates
3. Update Candidate
4. Delete Candidate
5. Back to Main Menu
Choose an option: 3
Enter Candidate ID to update: 1
Enter new Name (current: Alice Wilson): Alice M. Wilson
Enter new Email (current: alice.wilson@email.com): alice.wilson@email.com
Enter new Phone (current: 9123456789): 9123456790
Enter new Skills (current: Java, Spring, Oracle): Java, Spring, Oracle, Microser
Enter new Experience Years (current: 3): 4
Enter new Resume File Path (current: /path/to/alice_resume.pdf): /path/to/alice
Enter new Status (current: ACTIVE): HIRED
Candidate updated successfully!
--- Manage Candidates ---
1. Add Candidate
```

- 2. View All Candidates
- 3. Update Candidate
- 4. Delete Candidate
- 5. Back to Main Menu

--- All Candidates ---

Candidate{candidateId=1, name='Alice M. Wilson', email='alice.wilson@email.

- --- Manage Candidates ---
- 1. Add Candidate
- 2. View All Candidates
- 3. Update Candidate
- 4. Delete Candidate
- 5. Back to Main Menu

Choose an option: 4

Enter Candidate ID to delete: 1 Candidate deleted successfully!

- --- Manage Candidates ---
- 1. Add Candidate
- 2. View All Candidates
- 3. Update Candidate
- 4. Delete Candidate
- 5. Back to Main Menu

Choose an option: 2

--- All Candidates ---

(no output, list is empty if you deleted the only candidate)

- --- HireSmart CRM ---
- 1. Manage Recruiters
- 2. Manage Jobs
- 3. Manage Candidates
- 4. Manage Interviews
- 5. Exit

Choose an option: 4

- --- Manage Interviews ---
- 1. Schedule Interview
- 2. View All Interviews
- 3. Update Interview
- 4. Delete Interview
- 5. Back to Main Menu

Enter Interview ID to update: 1

Enter new Interview Date (current: 2024-07-12): 2024-07-15

Enter new Interview Time (current: 11:00 AM): 2:00 PM Enter new Status (current: COMPLETED): CANCELLED

Enter Feedback: Candidate unavailable, interview cancelled.

Enter Rating (1-10): 0

Interview updated successfully!

- --- Manage Interviews ---
- 1. Schedule Interview
- 2. View All Interviews
- 3. Update Interview
- 4. Delete Interview
- 5. Back to Main Menu

Choose an option: 2

--- All Interviews ---

Interview{interviewId=1, candidateId=1, jobId=1, recruiterId=1, interviewDate=2

- --- Manage Interviews ---
- 1. Schedule Interview
- 2. View All Interviews
- 3. Update Interview
- 4. Delete Interview
- 5. Back to Main Menu

Choose an option: 4

Enter Interview ID to delete: 1 Interview deleted successfully!

- --- Manage Interviews ---
- 1. Schedule Interview

```
2. View All Interviews
3. Update Interview
4. Delete Interview
5. Back to Main Menu
Choose an option: 2
---- All Interviews ---
(no output, list is empty if you deleted the only interview)
---- HireSmart CRM ---
1. Manage Recruiters
2. Manage Jobs
3. Manage Candidates
4. Manage Interviews
5. Exit
Choose an option: 5

Exiting...
...
```