AMITY UNIVERSITY, PATNA

AMITY INSTITUTE OF INFORMATION TECHNOLOGY

Advanced Java Lab
LAB FILE - 2

BCA

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CRUD OPERATIONS

Problem description:

Develop a simple Java application that utilizes JDBC (Java Database Connectivity) to establish a connection with a relational database system and perform basic CRUD (Create, Read, Update, Delete) operations on a specified database table. The application should:

1. Provide options to perform CRUD operations including inserting new records into the database table, retrieving existing records from the table based on specified criteria, updating records in the table, and deleting records from the table.

2. Implement error handling to manage connection failures and database operation exceptions gracefully.

The application should focus on simplicity and functionality, serving as a basic template for JDBC usage in CRUD operations.

DESIGN

The design of the problem statement for creating a simple Java application that establishes JDBC connection and performs CRUD operations involves several key components and considerations:

Objective

The objective of this project is to create a Java program in Eclipse that connects to a database using JDBC (Java Database Connectivity) and allows users to perform CRUD (Create, Read, Update, Delete) operations on a patient_info table. The program will present users with a menu containing seven options: insertion, read, update patient name, update patient city, deletion of a record, and exit. Patient's will be able to interact with the program through the console to manipulate the patient info records stored in the database.

Detailed Requirements:

1. Database Connectivity - The program must establish a connection to a relational database management system (RDBMS) using JDBC. Database connection parameters such as URL, username, and password should be configurable and provided as constants or properties in the program.

2. Menu Options - The program should display a menu with options like Insert, Read, Update patient name, Update patient city, Deletion and Exit option. Users will input the corresponding option number to execute the desired operation.

3. Insert Operation - Upon selecting the insert option, users will be prompted to input the patient's ID, name, city, age, and dob through the keyboard. The program will then insert this data into the patient_info table in the database.

4. Read Operation - Selecting the read option will display all records from the patient_info table. The program should fetch and display the patient's ID, name, city, age, and dob for each record in the table.

5. Update Operation - The program should provide separate options to update the team's name, captain, and coach. Upon selecting any of these options, users will input the patient ID whose details need to be updated, followed by the new value for the corresponding field. The program will then update the specified field for the given patient ID in the database.

6. Delete Operation - Selecting the delete option will prompt users to input the patient ID of the record they want to delete. The program will delete the record with the specified patient ID from the patient_info table in the database.

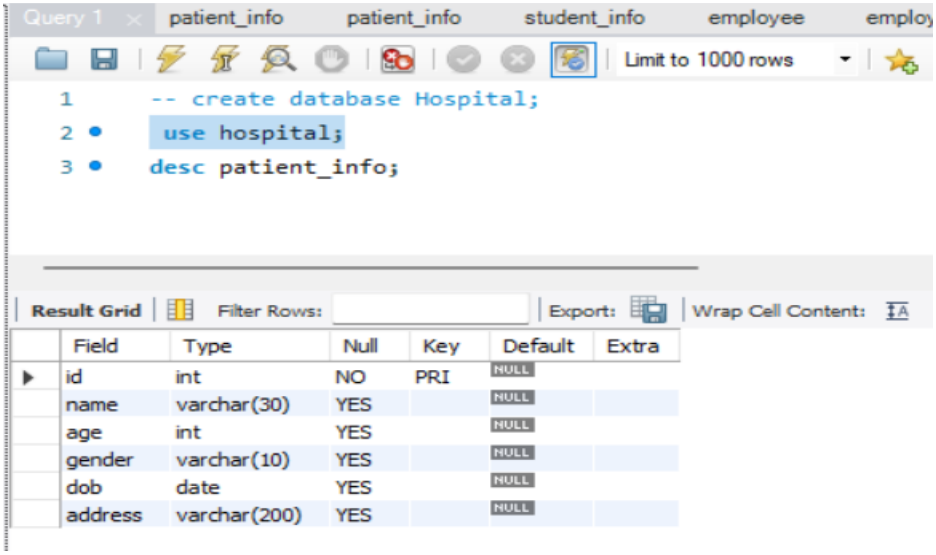
7. Error Handling - The program should handle exceptions gracefully, displaying meaningful error messages to users in case of connection failures, SQL errors, or invalid input. It should also validate user inputs to prevent SQL injection attacks or database errors due to incorrect data formats.

8. Exit - Upon selecting the exit option, the program will terminate gracefully, closing any open resources and releasing database connections.

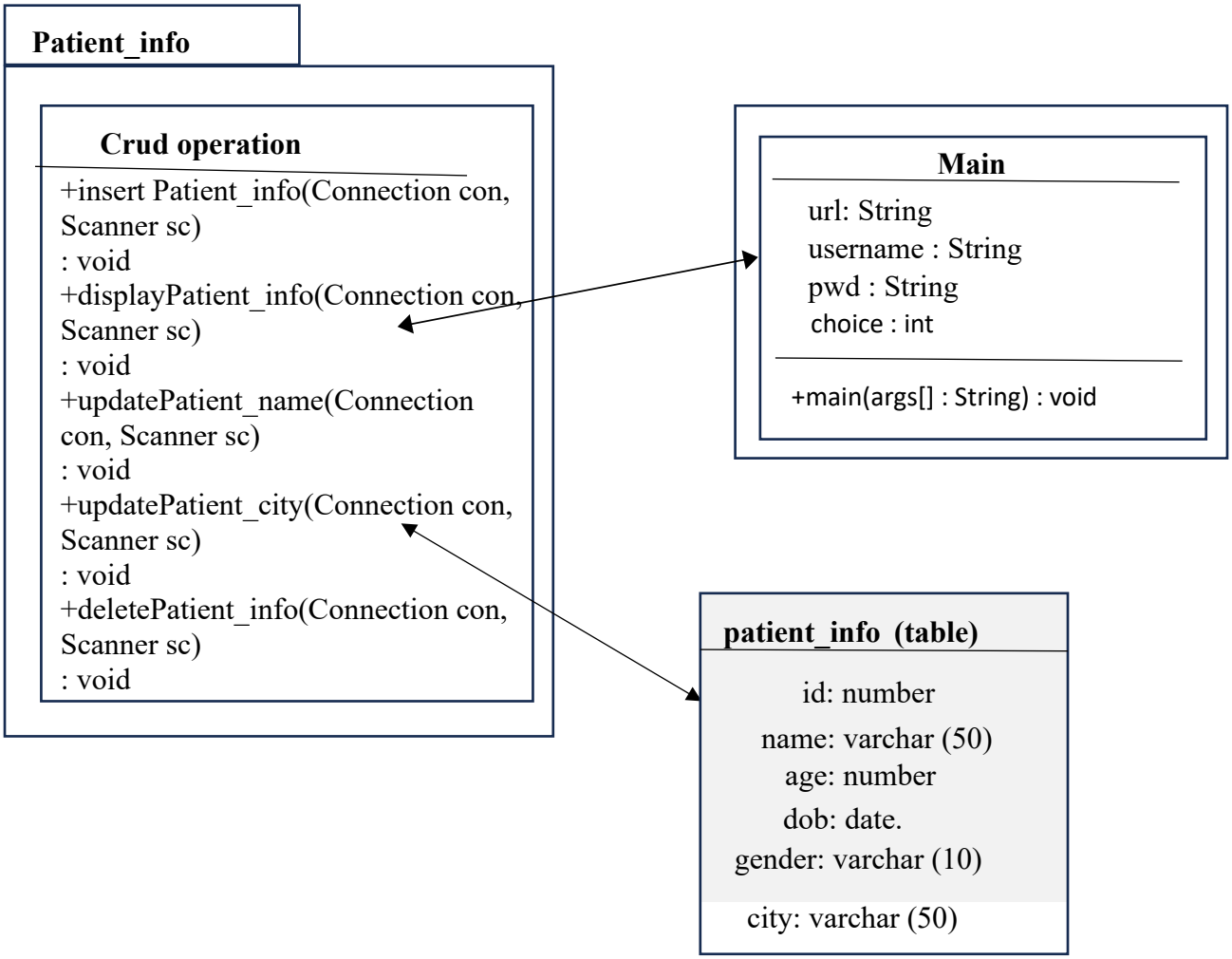
Tools and Technologies used: Eclipse IDE and MySQL workbench 8.0 CE

Design

Table description –



Class Diagram: The class diagram for our project will be as follows -



CODE

Patien info.java

```
 package hospital.details;


import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.ResultSet;

import java.sql.SQLException;

import java.sql.Statement;

import java.util.Scanner;


public class Patient_info {


public Patient_info() {

// TODO Auto-generated constructor stub

}



public void addPatient_info(Connection con, Scanner sc) throws SQLException

{

Statement st = con.createStatement();


//read Patient details

System.out.println("Enter Patient Id: ");

int id = sc.nextInt();


System.out.println("Enter Patient Name: ");

String name = sc.next();


System.out.println("Enter Patient Age: ");

int age = sc.nextInt();
```

```
System.out.println("Enter Patient Gender: ");

String gender = sc.next();


System.out.println("Enter Patient Date of Birth (DOB) in format YYYY/MM/DD:
");
        String dob = sc.next();


        System.out.println("Enter Patient City: ");

        String city = sc.next();



//create sql squery string

String query = String.format("Insert Into patient_info values(%d, '%s', %d,
'%s', '%s', '%s') ", id, name, age, gender, dob, city);


//execute sql query

int rows = st.executeUpdate(query);


System.out.println(rows + " record inserted!!!");

}


public void displayPatient_info(Connection con) throws SQLException

{

Statement st = con.createStatement();


ResultSet rs = st.executeQuery("select * from patient_info");

System.out.println("Displaying all patient info");


while(rs.next()) {

      System.out.println(rs.getInt(1)+      "\t"+rs.getString(2)+      "\t"+
rs.getInt(3)+"\t"+rs.getString(4)+"\t"+rs.getString(5)+"\t"+rs.getString(6)
);

}

}
```

```
public void updatePatient_name(Connection con, Scanner sc) throws SQLException {

Statement st = con.createStatement();

System.out.println("Enter Patient ID: ");

int id = sc.nextInt();

System.out.println("Enter Patient New Name: ");

String name = sc.next();


String query = String.format("update patient_info set name='%s' where id = %d", name, id);

int rowsAffected = st.executeUpdate(query);

System.out.println(rowsAffected+" recored updated!!!");


}


public void updatePatient_city(Connection con, Scanner sc) throws SQLException {

Statement st = con.createStatement();

System.out.println("Enter Patient ID: ");

int id = sc.nextInt();

System.out.println("Enter Patient New City name: ");

String city = sc.next();


String query = String.format("update patient_info set city='%s' where id = %d", city, id);

int rowsAffected = st.executeUpdate(query);

System.out.println(rowsAffected+" recored updated!!!");


}



public void deletePatient_info(Connection con, Scanner sc) throws SQLException {

Statement st = con.createStatement();
```

```
System.out.println("Enter Patient ID: ");
int id = sc.nextInt();

int rowAffected = st.executeUpdate("delete from patient_info where id =
"+id);
System.out.println(rowAffected + " recored deleted!!!");
}

public static void main(String[] args) throws ClassNotFoundException,
SQLException {
// TODO Auto-generated method stub
Class.forName("com.mysql.cj.jdbc.Driver");

String url = "jdbc:mysql://localhost:3306/hospital";
String username = "root";
String pwd = "Mysql@2024";
Connection con = DriverManager.getConnection(url, username, pwd);

Scanner sc = new Scanner(System.in);

Patient_info pi = new Patient_info();

while(true) {

      menu();
      int choice = sc.nextInt();
      switch(choice) {
      case 1: pi.addPatient_info(con, sc);
            break;

      case 2: pi.displayPatient_info(con);
            break;
```

```
		case 3: pi.updatePatient_name(con, sc);
			break;
		case 4:
			pi.updatePatient_city(con, sc);
			break;

		case 5: pi.deletePatient_info(con, sc);
			break;

		case 6:
			System.out.println("Bye Bye ...");
			System.exit(0);

		default:
			System.out.println("Wrong Choice...");
		}

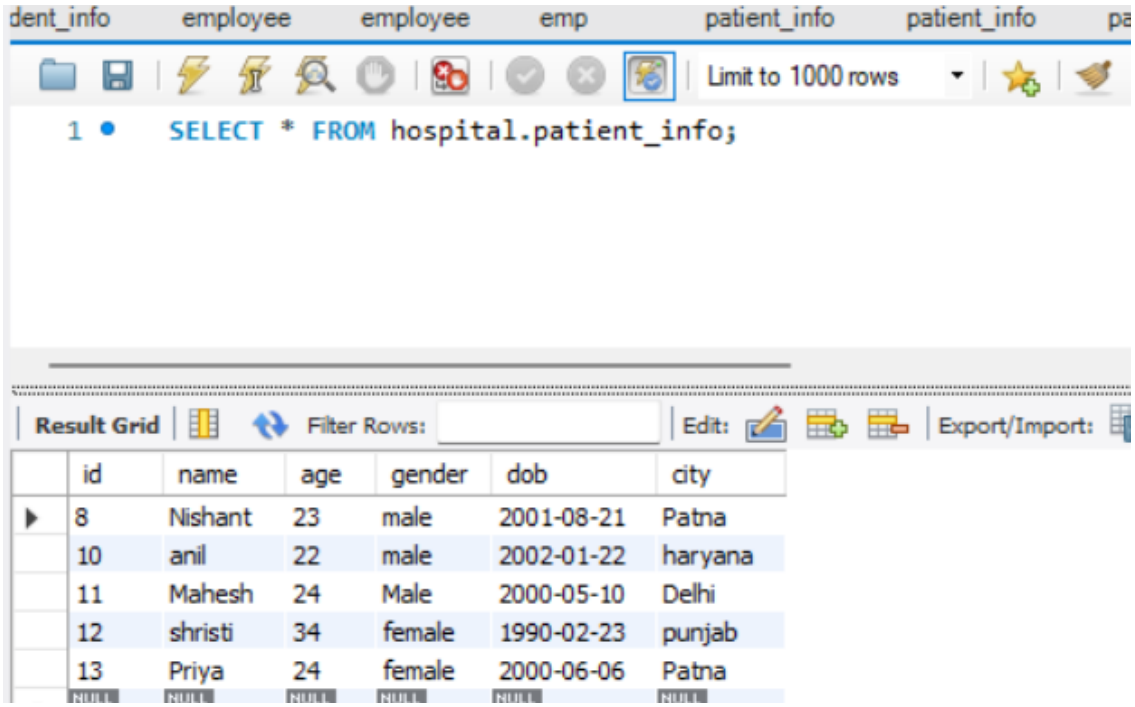
	}
	}


	public static void menu() {
	System.out.println("------------Menu-----------");
	System.out.println("1. Add New Patient");
	System.out.println("2. Display All Patients");
	System.out.println("3. Update Name of Patient");
	System.out.println("4. Update City of Patient");
	System.out.println("5. Delete a Patient details");
	System.out.println("6. Exit");
	System.out.println("Your Choice...");
	}

	}
```

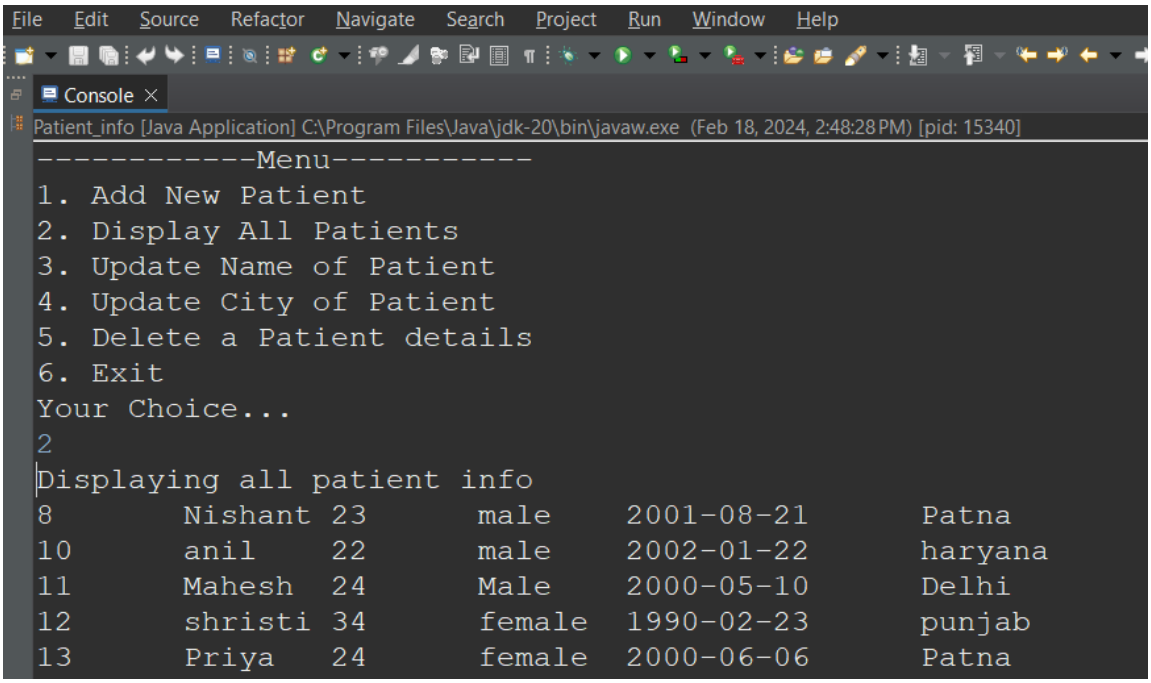
INPUT/OUTPUT

Selecting the table



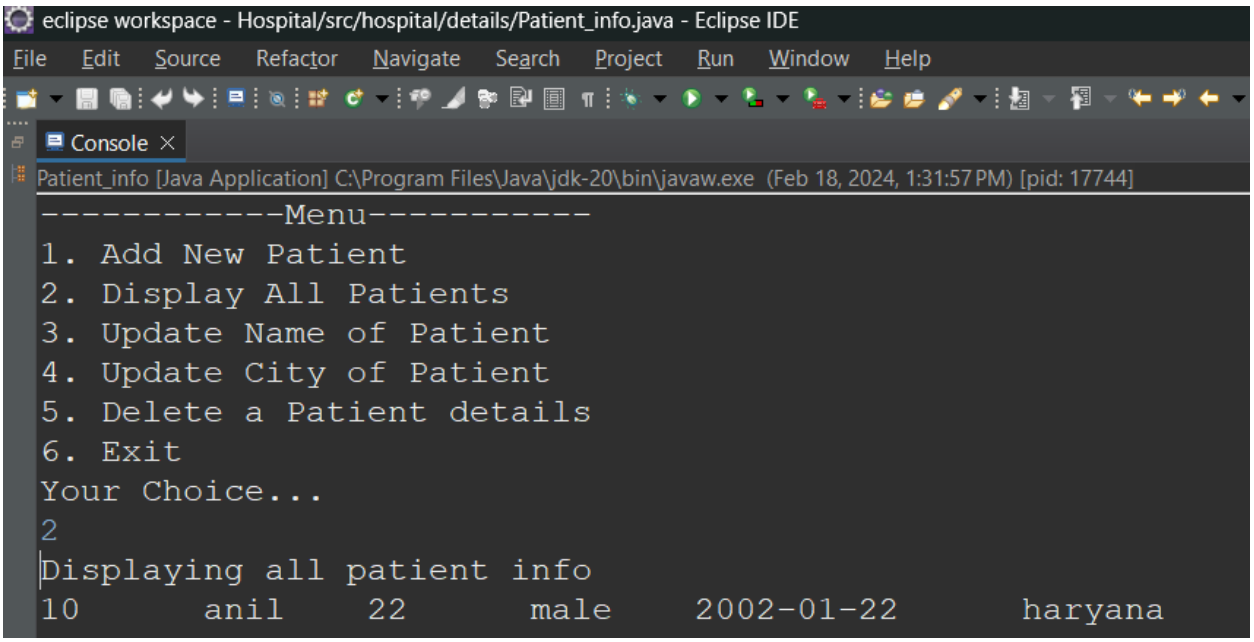
id	name	age	gender	dob	city
8	Nishant	23	male	2001-08-21	Patna
10	anil	22	male	2002-01-22	haryana
11	Mahesh	24	Male	2000-05-10	Delhi
12	shristi	34	female	1990-02-23	punjab
13	Priya	24	female	2000-06-06	Patna

Display operation

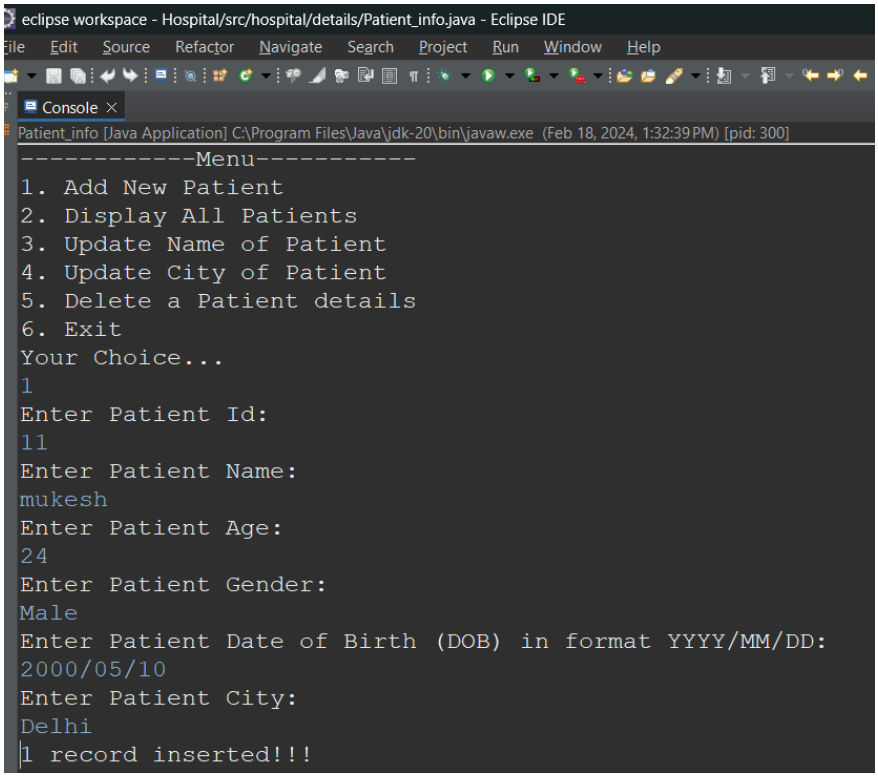


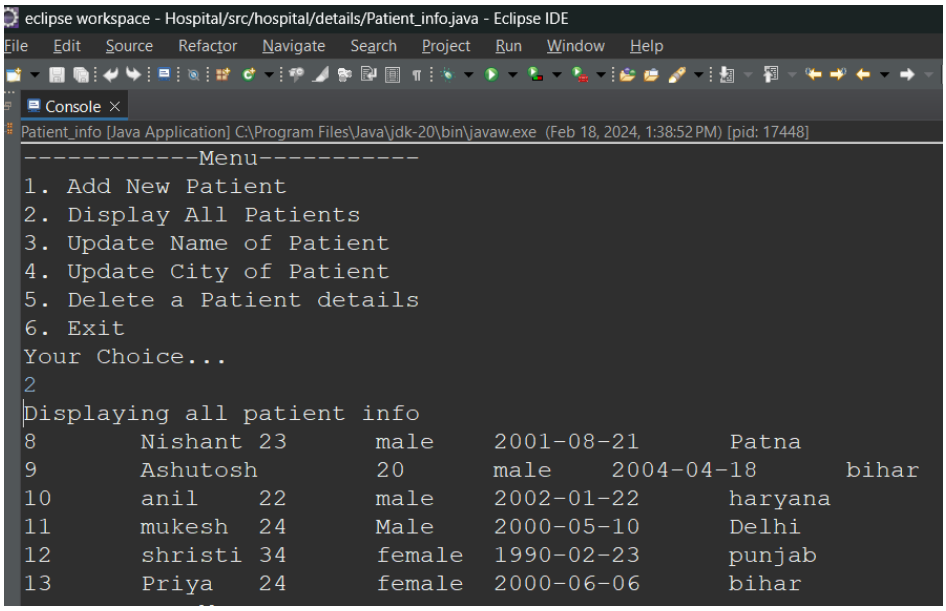
Insert operation

Before insertion:



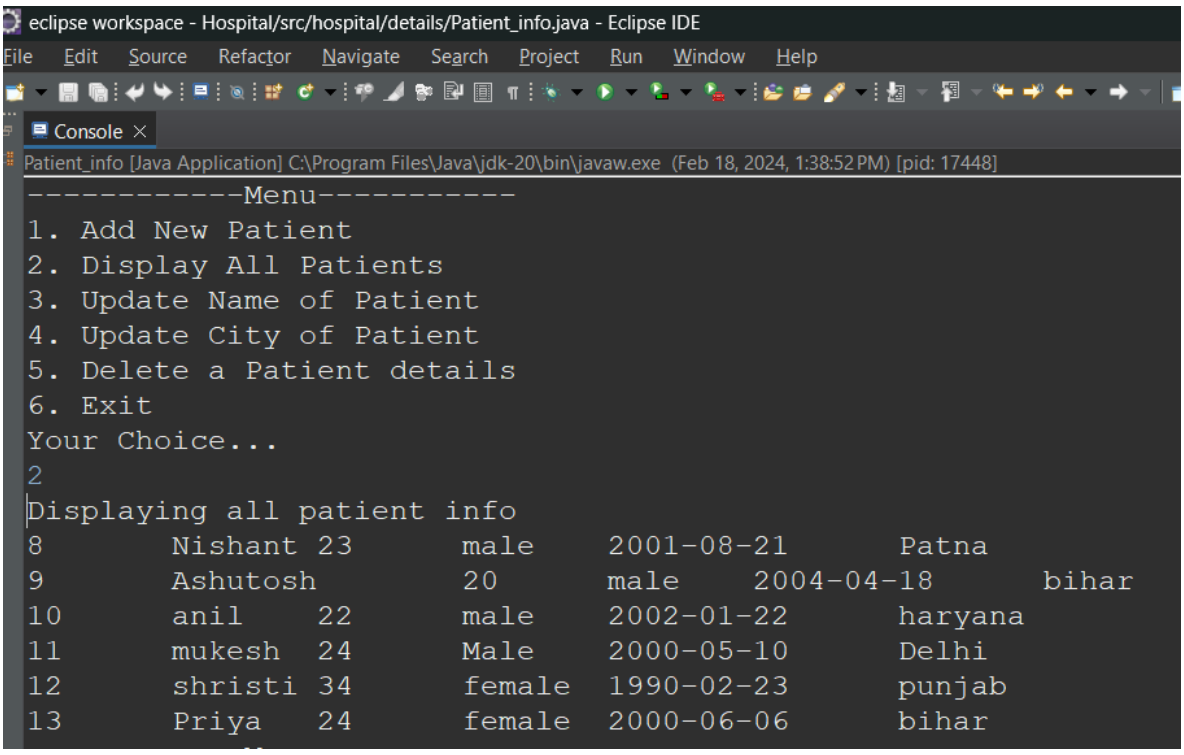
After insertion:



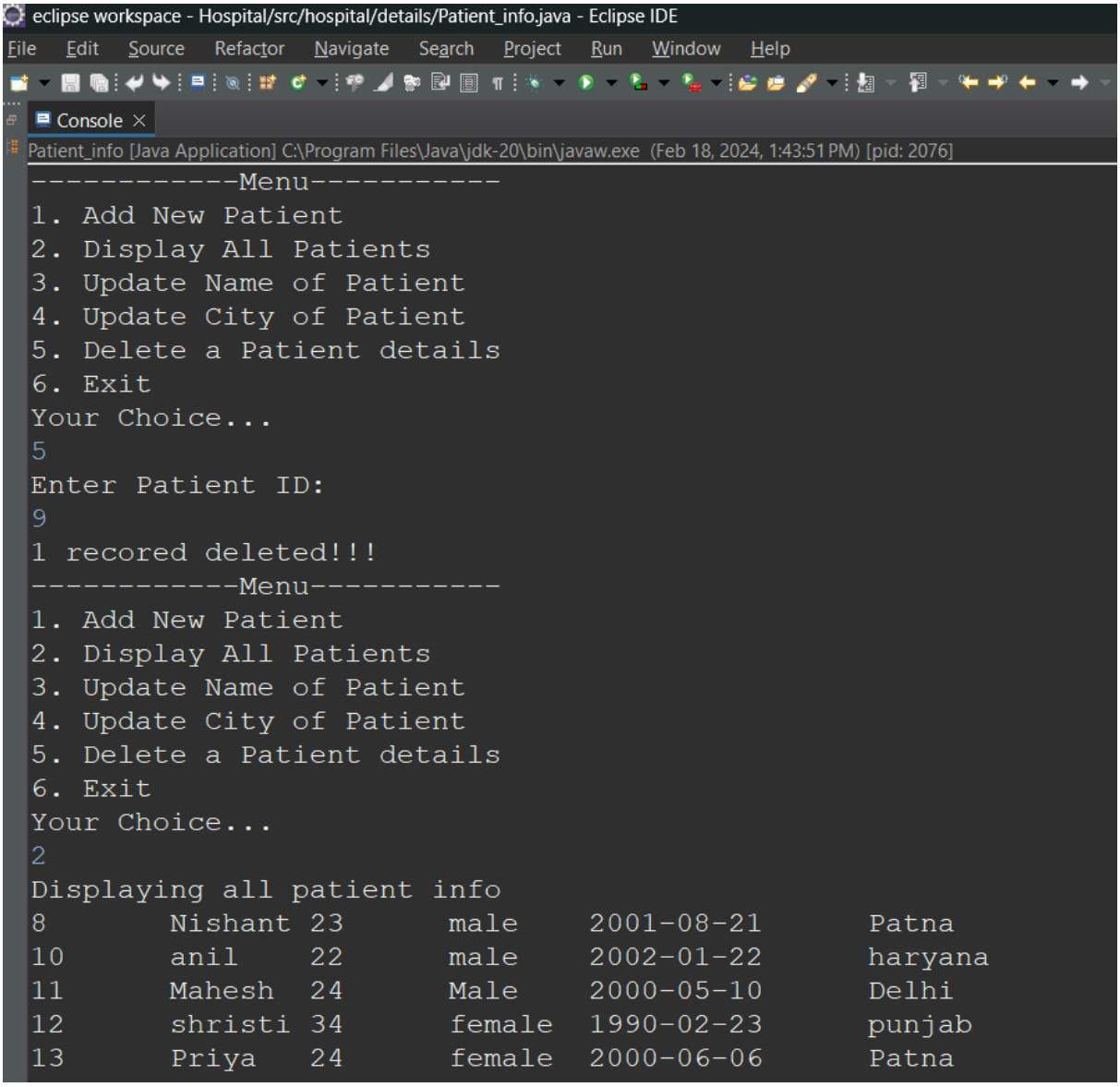


Delete operation

Before Deletion:



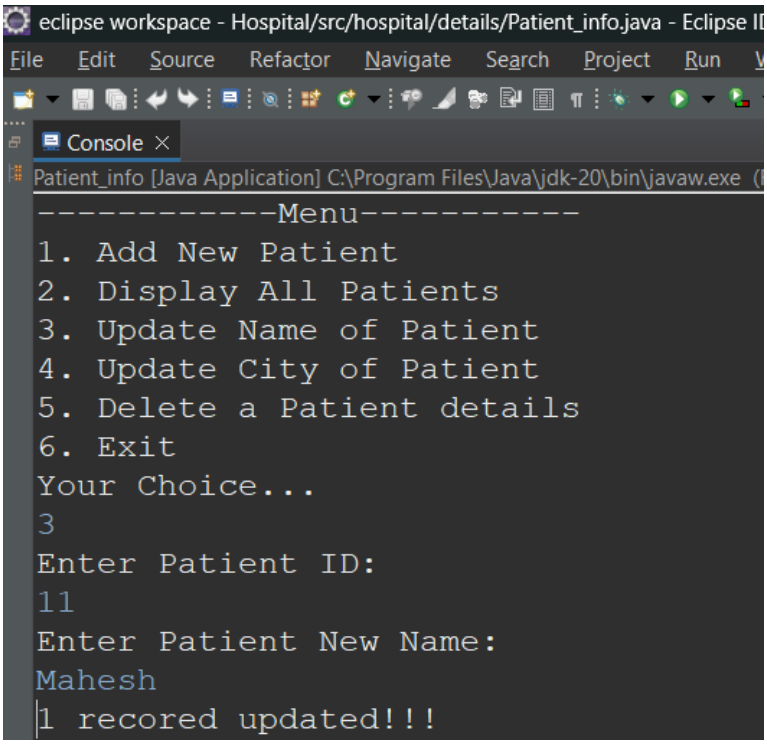
After Deletion:



Update operation

Update name of patient

Before updation:



After updation:

```
----------Menu----------
1. Add New Patient
2. Display All Patients
3. Update Name of Patient
4. Update City of Patient
5. Delete a Patient details
6. Exit
Your Choice...
2
Displaying all patient info
8       Nishant 23      male    2001-08-21      Patna
9       Ashutosh        20      male    2004-04-18      bihar
10      anil    22      male    2002-01-22      haryana
11      Mahesh  24      Male    2000-05-10      Delhi
12      shristi 34      female  1990-02-23      punjab
13      Priya   24      female  2000-06-06      bihar
```

Update city of Patient

Before updation:

```
------------Menu-----------
1. Add New Patient
2. Display All Patients
3. Update Name of Patient
4. Update City of Patient
5. Delete a Patient details
6. Exit
Your Choice...
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Displaying all patient info
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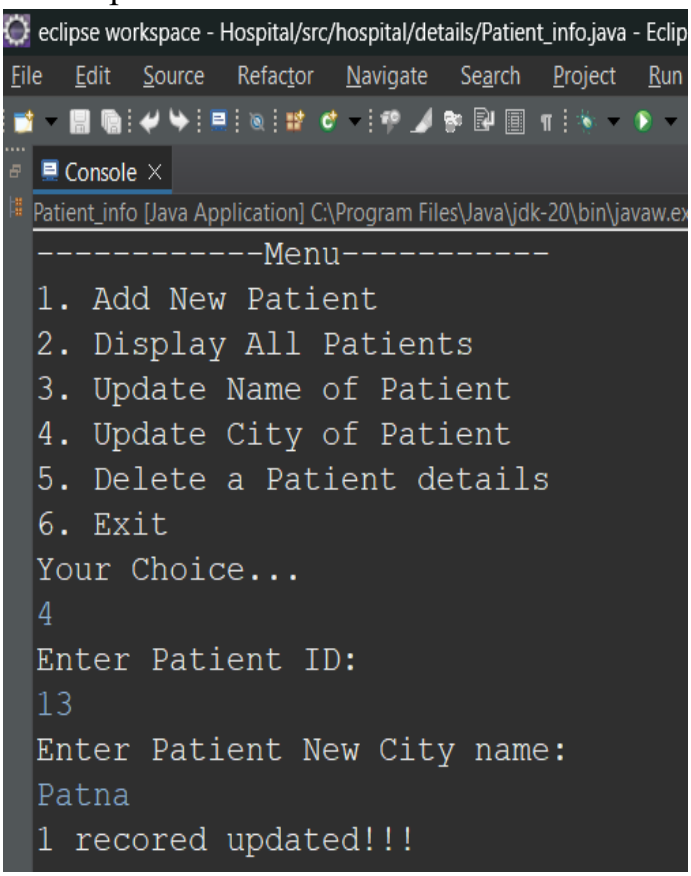
9       Ashutosh        20      male    2004-04-18      bihar
10      anil    22      male    2002-01-22      haryana
11      Mahesh  24      Male    2000-05-10      Delhi
12      shristi 34      female  1990-02-23      punjab
13      Priya   24      female  2000-06-06      bihar
```

After updation:



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------------Menu-----------
1. Add New Patient
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```