**Problem Statement:**

You are tasked with developing a Java application to manage voter data using JDBC and MySQL. The application should allow users to perform CRUD (Create, Read, Update, Delete) operations on the voter data stored in the database. Additionally, it should validate each operation to ensure correct input and data integrity. Users will also be able to query and view the number of active voters during a specific period.

**Table Name: voter**

**Column Name Data Type**

voter\_id int Primary key

name varchar(100)

age int

gender varchar(10) Gender (Male/Female/Other)

registration\_date date Date when the voter registered

valid\_start\_date date Date from when the voter’s registration is valid

valid\_end\_date date Date until when the voter’s registration is valid

**Validation for each operation:**

1. **Inserting Voter:**
   * Validate that the voter name is not empty
   * Age must be a positive integer, and within a valid range (18 to 120 years).
   * Gender must be one of the following: Male, Female, or Other.
2. **Updating Voter:**
   * Ensure the voter exists based on the voter\_id before updating.
   * Validate that the new age is a positive integer.
3. **Deleting Voter:**
   * Ensure the voter ID exists in the database.
   * Delete only if the voter is not marked as inactive by the valid\_end\_date as null.
4. **Show All Voters:**
   * Display all voters currently in the database, including their details.
5. **Show Active Voters:**
   * A new query to display all active voters, i.e., those whose valid\_start\_date <= current date <= valid\_end\_date.
   * Logic – CURDATE() BETWEEN valid\_start\_date AND valid\_end\_date

**Operations:**

1. **Insert Voter Details**
   * Input: Voter ID, Name, Age, Gender, Registration Date, Valid Start Date, Valid End Date.
   * Validation: Checks as described above.
2. **Update Voter Details**
   * Input: Voter ID, New Age.
   * Validation: Ensure the voter exists and the new details are valid.
3. **Delete Voter Details**
   * Input: Voter ID.
   * Validation: Ensure the voter exists and is eligible for deletion (active).
4. **Show All Voter Details**
   * Output: Display all voters in the table.
5. **Show Active Voters (New Query)**
   * Output: Display all voters whose registration is currently valid (based on the current date) i.e sysdate < valid\_end\_date

**Input Format:**

The input consists of an operation number followed by the relevant details for that operation:

1. **Insert Voter (1):**

1

1006

Michael Wilson

50

Male

2024-01-06

2024-01-06

2025-01-06

1. **Update Voter Age (2):**

2

1001

45

1. **Delete Voter (3):**

3

1001

1. **Show All Voter Details (4):**

4

1. **Show Active Voters (5):**

5

**Output Format:**

For each operation, the output will show the appropriate result or a confirmation message.

1. **Insert Voter:**

Voter added successfully.

ID: 1001, Name: John Doe, Age: 30, Gender: Male, Registration Date: 2024-01-01

ID: 1002, Name: Jane Smith, Age: 25, Gender: Female, Registration Date: 2024-01-02

ID: 1003, Name: Alice Johnson, Age: 45, Gender: Female, Registration Date: 2024-01-03

ID: 1004, Name: Bob Brown, Age: 60, Gender: Male, Registration Date: 2024-01-04

ID: 1005, Name: Emily Davis, Age: 35, Gender: Female, Registration Date: 2024-01-05

ID: 1006, Name: Michael Wilson, Age: 50, Gender: Male, Registration Date: 2024-01-06

1. **Update Voter Age:**

Voter updated successfully.

ID: 1001, Name: John Doe, Age: 45, Gender: Male, Registration Date: 2024-01-01

ID: 1002, Name: Jane Smith, Age: 25, Gender: Female, Registration Date: 2024-01-02

ID: 1003, Name: Alice Johnson, Age: 45, Gender: Female, Registration Date: 2024-01-03

ID: 1004, Name: Bob Brown, Age: 60, Gender: Male, Registration Date: 2024-01-04

ID: 1005, Name: Emily Davis, Age: 35, Gender: Female, Registration Date: 2024-01-05

1. **Delete Voter:**

Voter deleted successfully.

ID: 1002, Name: Jane Smith, Age: 25, Gender: Female, Registration Date: 2024-01-02

ID: 1003, Name: Alice Johnson, Age: 45, Gender: Female, Registration Date: 2024-01-03

ID: 1004, Name: Bob Brown, Age: 60, Gender: Male, Registration Date: 2024-01-04

ID: 1005, Name: Emily Davis, Age: 35, Gender: Female, Registration Date: 2024-01-05

1. **Show All Voter Details:**

ID: 1001, Name: John Doe, Age: 30, Gender: Male, Registration Date: 2024-01-01

ID: 1002, Name: Jane Smith, Age: 25, Gender: Female, Registration Date: 2024-01-02

ID: 1003, Name: Alice Johnson, Age: 45, Gender: Female, Registration Date: 2024-01-03

ID: 1004, Name: Bob Brown, Age: 60, Gender: Male, Registration Date: 2024-01-04

ID: 1005, Name: Emily Davis, Age: 35, Gender: Female, Registration Date: 2024-01-05

1. **Show Active Voters:**

ID: 1001, Name: John Doe, Age: 30, Gender: Male, Registration Date: 2024-01-01

ID: 1002, Name: Jane Smith, Age: 25, Gender: Female, Registration Date: 2024-01-02

Additional features to be implemented

1. **Delete Voter Details if voter age is below given age**
   * Input: age
   * Validation: Ensure the voter exists. If not display “No voters available below age [age]”
2. **Delete Voter Details of all who’s age is below the given threshold age and name not matching the given input name.**
   * Input: threshold age and voter name
   * Validation: Ensure voter exists. If not display “No voters available below the given threshold age [age] and name not match [name]”
   * Output: Display number of voters deleted.
3. **Display all records whose names contain the given string**
   * Input: string to search
   * Validation: Ensure voter exists. If not display “No voters available”
   * Output: Display all voters details whose names contain the given string.
4. **Display all records whose names start with the given string**
   * Input: string to search
   * Validation: Ensure voter exists. If not display “No voters available”
   * Output: Display all voters details whose names start with the given string.
5. **Display all records whose names end with the given string**
   * Input: string to search
   * Validation: Ensure voter exists. If not display “No voters available”
   * Output: Display all voters details whose names end with the given string.

Initial Query

CREATE TABLE voter (

voter\_id INT PRIMARY KEY,

name VARCHAR(100),

age INT,

gender VARCHAR(10),

registration\_date DATE,

valid\_start\_date DATE,

valid\_end\_date DATE

);

INSERT INTO voter VALUES(1001,'John Doe',30,'Male','2024-01-01', '2024-01-01', '2034-01-01');

INSERT INTO voter VALUES(1002, 'Jane Smith',25, 'Female', '2024-01-02', '2024-01-02', '2023-01-02');

INSERT INTO voter VALUES(1003,'Alice Johnson',45, 'Female', '2024-01-03', '2024-01-03', '2034-01-03');

INSERT INTO voter VALUES(1004,'Bob Brown',60,'Male','2024-01-04', '2024-01-04', '2024-01-04');

INSERT INTO voter VALUES(1005, 'Emily Davis',35,'Female','2024-01-05', '2024-01-05', '2023-01-05');