Real Estate Agents User's Manual

Forward

This software is a course project for the 2023 winter Master's program in Advanced Databases System (in English) at Brno University of Technology Faculty of Information Technology in the Czech Republic. This project successfully implements various functionalities for inserting, deleting, updating, and querying spatial data and multimedia data in an Oracle database 19c. It essentially fulfills all the course requirements.

This project is designed for users who have some basic knowledge of databases.

All the code for this project was written by the authors, with reference materials obtained from various books and the internet. Due to the level of authors, there may be some vulnerabilities in the project. If readers discover any vulnerabilities, we would greatly appreciate it if you could point them out. Your feedback is invaluable!

2023 in Brno, Czech Republic

Contents

Introduction

The project primarily focuses on implementing basic operations for Oracle 19c spatial databases and multimedia databases, including insert, delete, query, and update functions, as well as some advanced spatial data operations.

The project was developed on the Windows operating system using IntelliJ IDEA 2023.2.3. The frontend utilizes the JavaFX client application platform with a version number of 21.0.1, while the backend is developed using Java 1.8 and Apache Maven as the project management tool. Java Development Kit (JDK)19 is used, along with Java Database Connectivity (JDBC), ojdbc8.jar, ordim.jar, sdoAPI.jar, and other libraries.

This project is available in English only.

Due to historical reasons, starting from Java 11, JavaFX components have been separated. Therefore, when invoking JavaFX or related components, you may encounter a prompt stating: "Missing JavaFX runtime components; please use these components to run this application." To resolve this, VM Options need to be configured.

Operation

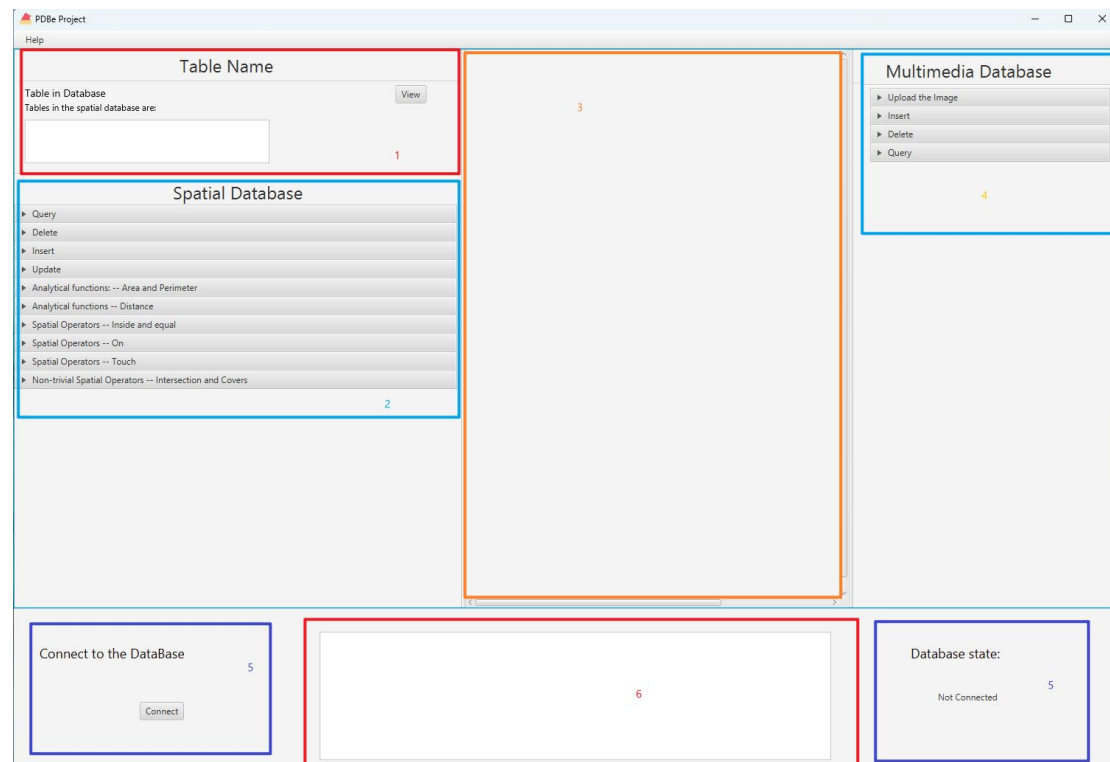## Interface

The main interface of the project is shown below:

The project is primarily divided into six major sections, as follows:

Area ① for querying table names throughout the entire database.

Area ②primarily for operations on the spatial database.

Area ③ mainly for displaying images uploaded to the multimedia database.

Area ④ primarily for operations in the multimedia database.

Area ⑤ primarily for executing database connection operations.

Area ⑥ mainly for displaying data from tables in the spatial database.

Oracle Spatial：
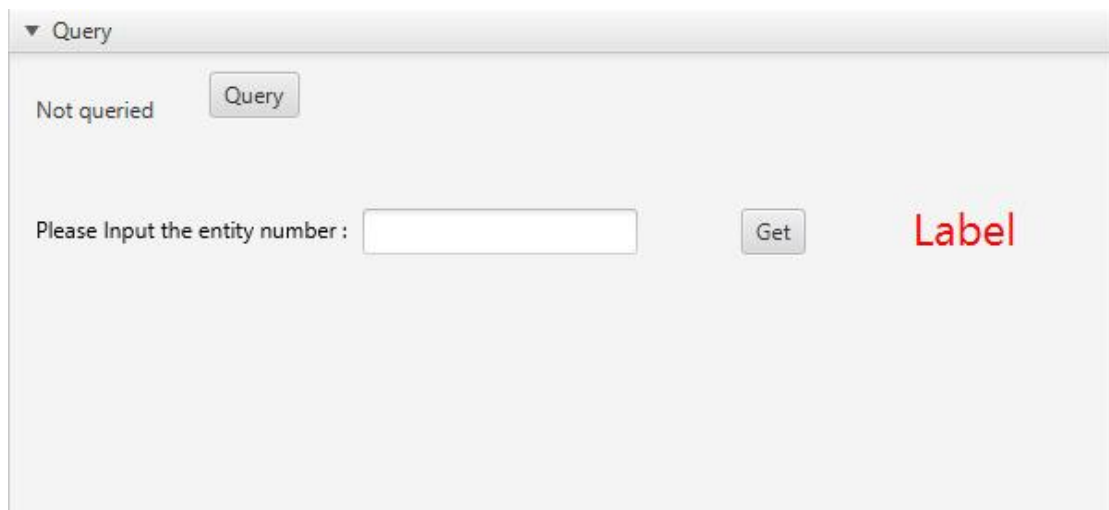
Query

The Query function page is shown below.

On this page, two functions have been implemented:

① Clicking the "Query" button allows you to query the table in Area 1, which stores Spatial Data. Prior to clicking the query button, selecting the table name from Area 1 is an essential operation.

② Clicking the "Get" button enables you to check if data corresponding to the ID entered in the text box exists in the database. If the data exists, the Label will change to "True"; otherwise, it will change to "False".

Delete

The Delete function page is shown below.

Figure 3: Spatial Database --- Delete

On this page, one functions have been implemented:

① When a user enters an ID corresponding to a number in the input box and then clicks the "Delete" button, all data corresponding to that ID will be deleted from the database.

Insert

The Insert function page is shown below.

Figure 4: Spatial Database --- Insert

On this page, one functions have been implemented:

① Users can freely insert spatial entity data on this interface. In the "Object Type" section, they can choose from options such as Point, Line-Strings, Polygon, Circle, etc. Afterward, they can click the "Insert" button to submit the operation.
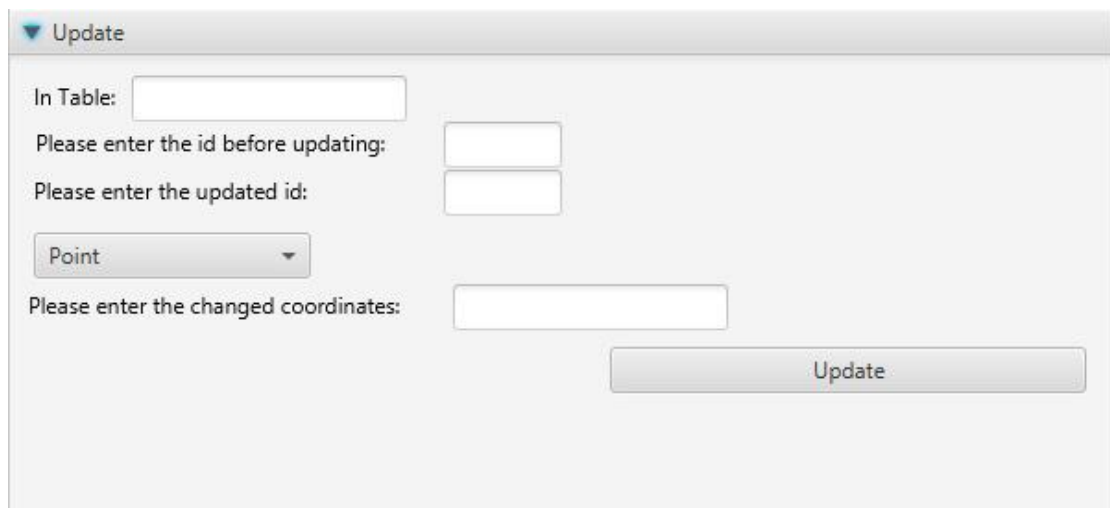
Update

The Update function page is shown below.

Figure 5: Spatial Database --- update

① Users can freely update the ID of spatial data and the coordinates of different object types within the selected table. Afterward, they can click the "Update" button to submit. There is no need for users to fill in the table name; clicking on the table name in Area 1 will automatically populate it.

Area and Perimeter

The Area and Perimeter function page is shown below.

Figure 6: Spatial Database --- Area and Perimeter

① Users can click on the table name within Area 1, and it will automatically populate. Afterward, by entering the entity ID in the second text box and clicking the "Get" button, they can automatically retrieve the area and perimeter of that entity.

Distance

The distance function page is shown below.

Figure 7: Spatial Database --- Distance

① After clicking on the table name within Area 1, the table name will automatically populate. Subsequently, users only need to enter the entity IDs of two entities and click the "Get" button. This will compute the minimum distance between two geometry objects, which is the distance between the closest pair of points or segments of the two objects.

Inside and Equal

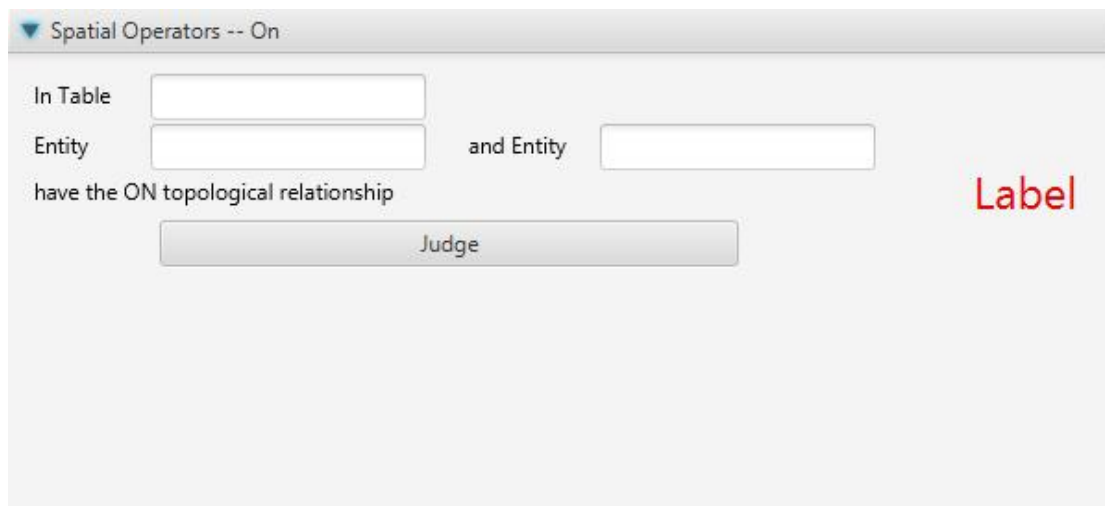The Inside and Equal function page is shown below.

Figure 8: Spatial Database --- Inside and Equal

① After clicking on the table name within Area 1, the table name will automatically populate. Subsequently, users only need to enter the entity IDs of two entities and click the "Judge inside" button. This will Returns EQUAL if the boundaries and interior of the objects exactly overlap, including any holes (that is, if the two geometries are topologically equal); otherwise, returns FALSE. When click the "Judge equal" button. This will Returns INSIDE if the first object is entirely within

the second object and the object boundaries do not touch; otherwise, returns FALSE.

On

The On function page is shown below.

Figure 9: Spatial Database --- On

① After clicking on the table name within Area 1, the table name will automatically populate. Subsequently, users only need to enter the entity IDs of two entities and click the "Judge" button. It will Checks if they will have the ON topological relationship. If have, the Label will be Ture, or False.

Touch

The touch function page is shown below.

Figure 10: Spatial Database --- Touch

① After clicking on the table name within Area 1, the table name will automatically populate. Subsequently, users only need to enter the entity IDs of two entities and click the "Judge" button. It will Returns TOUCH if the two objects share a common boundary point, but no interior points; otherwise, returns FALSE.

Intersection and Covers

The Intersection and Covers function page is shown below.

Figure 11: Spatial Database --- Intersection and Covers

① After clicking on the table name within Area 1, the table name will automatically populate. Subsequently, users only need to enter the entity IDs of two entities and click the "Judge" button. Afterward, the program will check whether the two entities satisfy spatial conditions of Intersection and Covers. If the query conditions are met, the text box will display "Yes"; otherwise, it will display "No."

② Intersection: Returns a geometry object that is the topological intersection (AND operation) of two geometry objects.

③ Covers: Checks if any geometries in a table have the COVERS topological relationship with a specified geometry.

Oracle Multimedia:
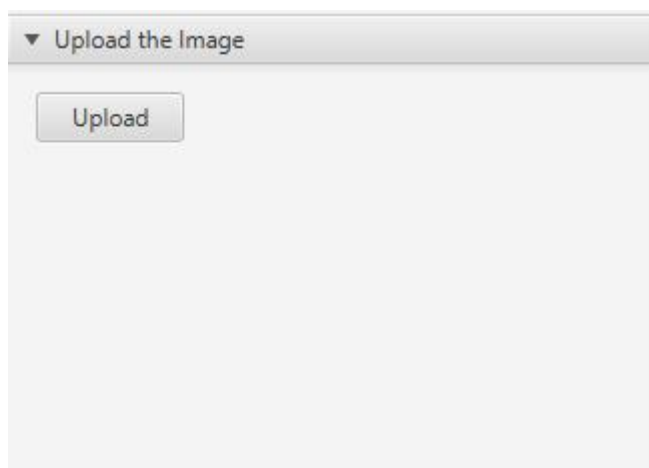
Upload

The Upload function page is shown below.

Figure 12: Multimedia Database --- Upload

① When the user clicks the "Upload" button, a window will appear, allowing the

user to select an image from their own computer. Afterward, the selected image will

be displayed in Area 3.
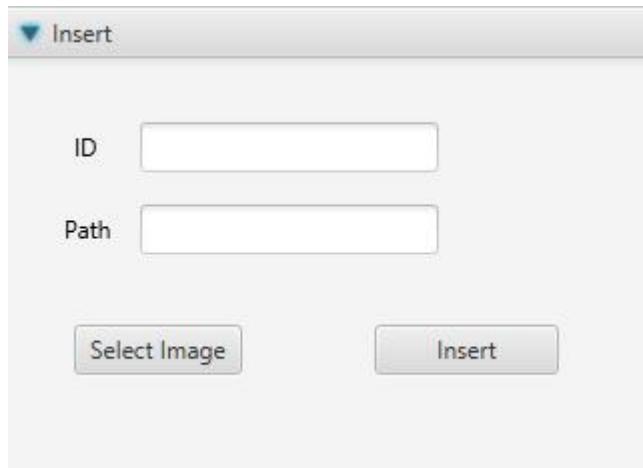
Insert

The Insert function page is shown below.

① After clicking "Select Image," the user can upload an image from their local

device. Subsequently, the absolute path of the selected image will be displayed in

the "Path" text box. Once the user assigns an ID to it, they can click "Insert" to insert

it into the database.

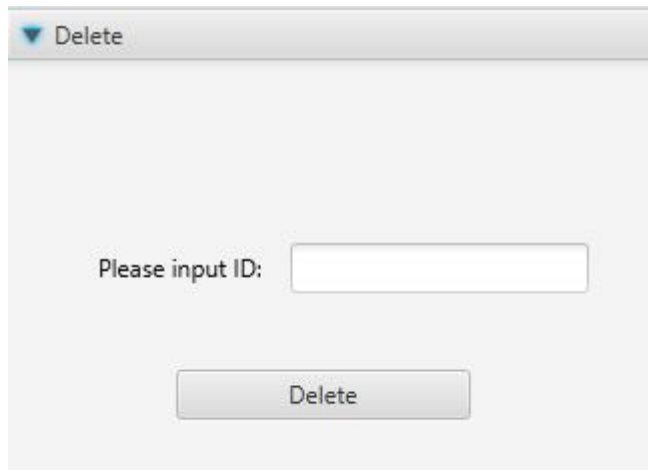## Delete

The Delete function page is shown below.

① When the user enters an ID value in the text box and clicks the "Delete" button,

it will remove the corresponding data from the database.

Query

The Query function page is shown below.

Figure 15: Multimedia Database --- Query

① When the user enters an ID value in the text box and clicks the "Query" button, it

will query the corresponding data from the database. If the query is successful, the

Label will turn true; otherwise, it returns false.

Connect the Database

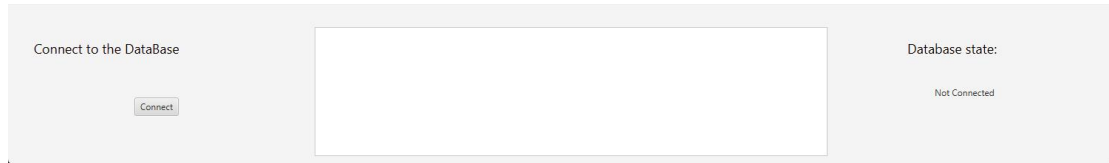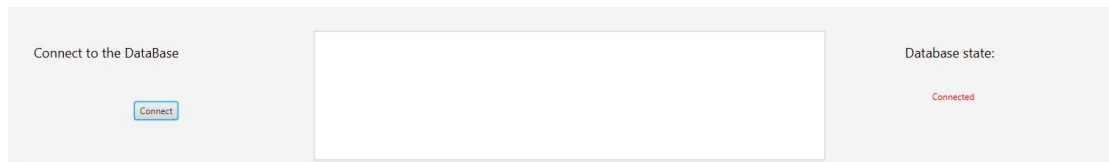The feature page is as shown in the following image:

Figure 16: Connect the Database

When the user clicks "Connect," if the connection is successful, it will change to

appear as shown in the following image:

References

[1] Oracle Spatial and Graph Developer's Guide, 19c
[2] https://rychly-edu.gitlab.io/dbs/spatial/oracle/
[3] https://rychly-edu.gitlab.io/dbs/multimedia/oracle/