Oracle Spatial/Locator Lab

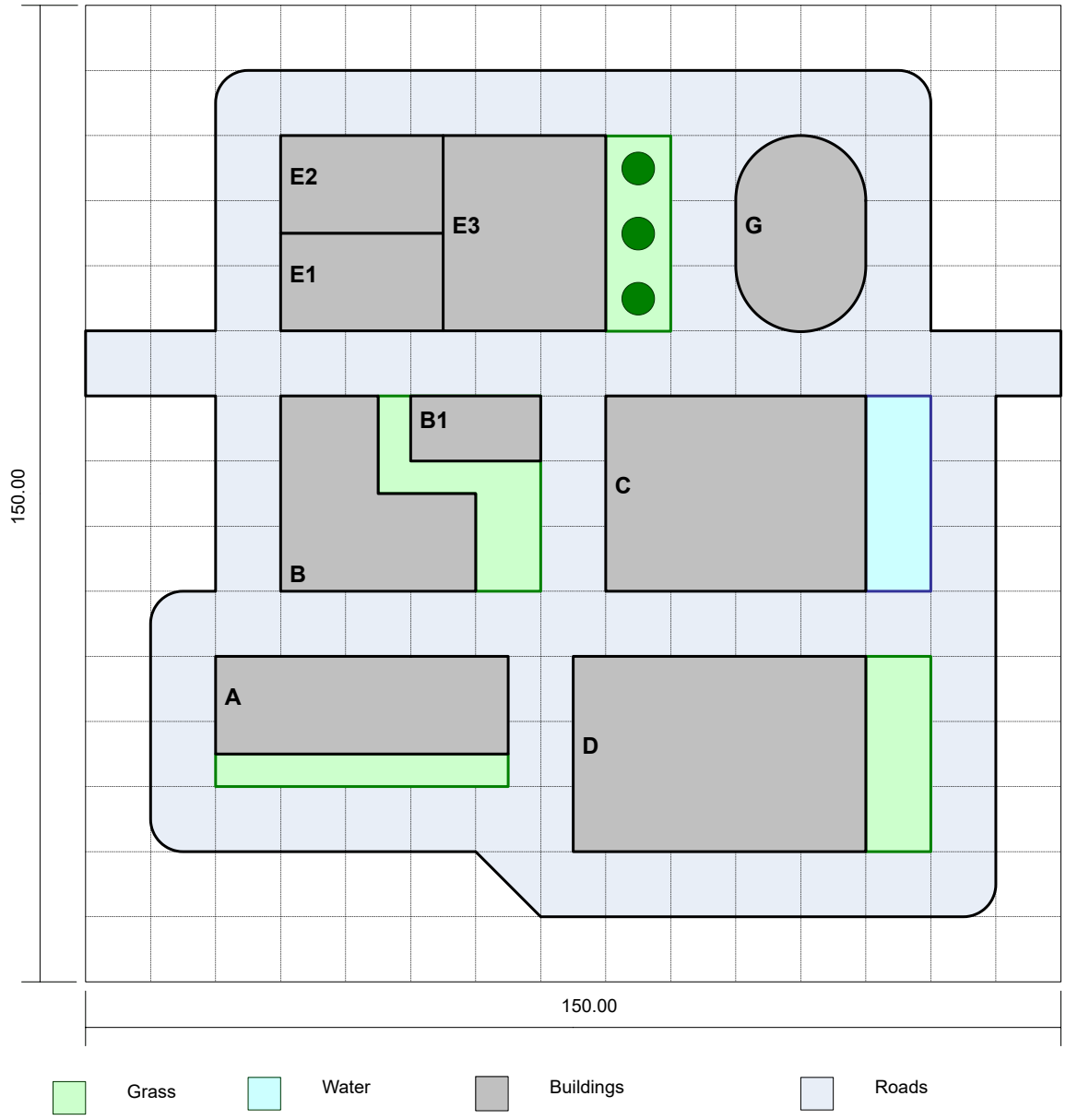
City

Create a table in the Oracle database server for the following city plan. All geometries in the map are disjunctive, i.e., neither roads nor building, grass, or water have non-empty intersection. Therefore, roads must be a polygon with holes corresponding to buildings, grass, and water surrounded by the roads.

The table `city` should have three columns:

- `name` of the object in the plan (e.g., “B”),
- `type` of the object (e.g., “building”),
- `geometry` of the object of type `SDO_GEOMETRY`.

The size of individual cells of the mesh is 10x10 pixels.



Spatial Queries

1. What is the distance between building A and building G?
2. What is the total built-up area?
3. What is the total green (grass and trees) area?
4. What is the total area of communications (roads)?
5. Which building has the largest built-up area?
6. Which buildings have the same built-up area?
7. Which building is adjacent to the largest green area (grass)?

8. Which building is adjacent to the water surface?

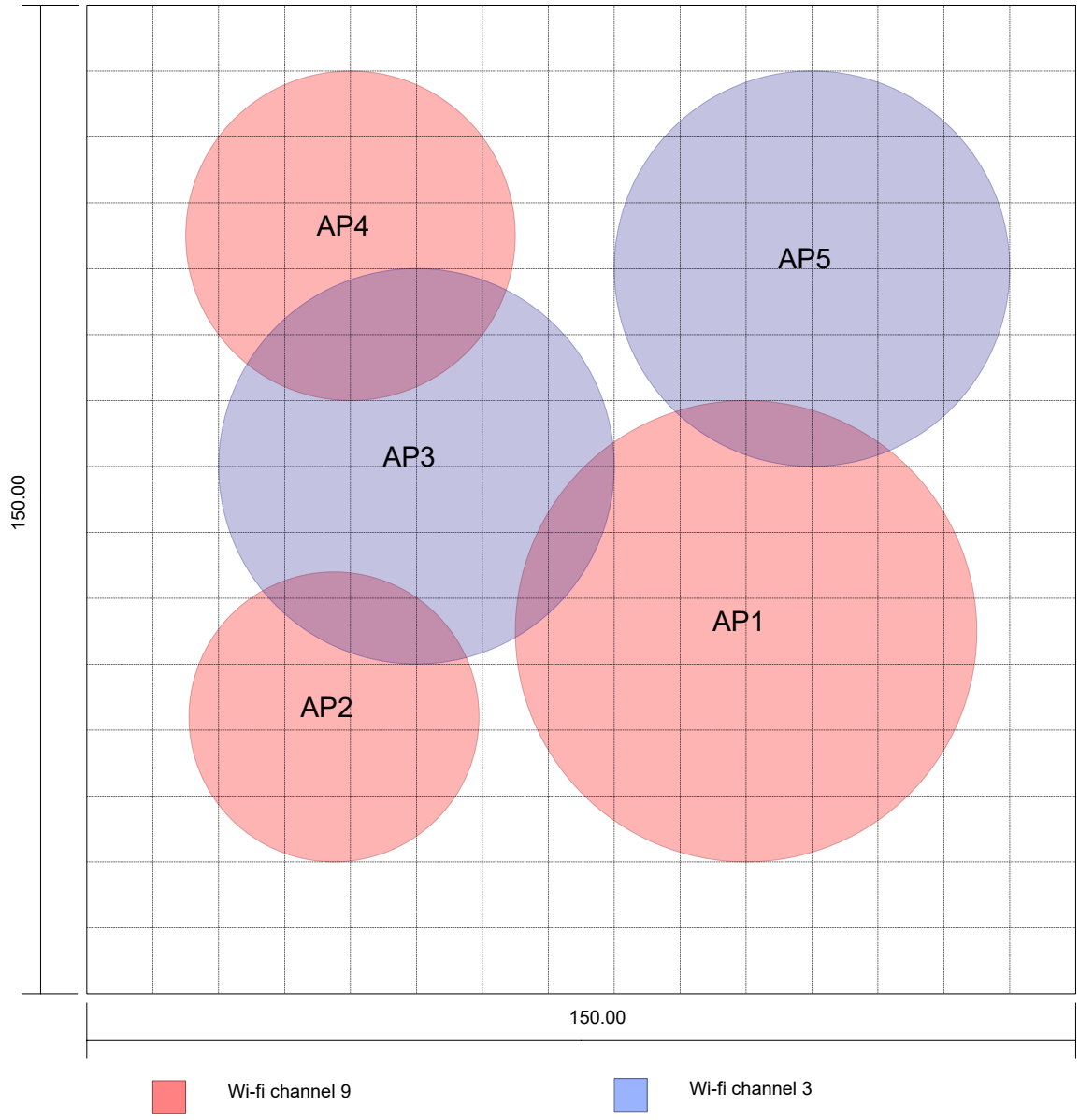
Wi-Fi

Create a table in the Oracle database server for the following Wi-Fi coverage map. There are 5 access points (APs) on Wi-Fi channels 3 and 9.

The table `wifi` should have two columns:

- `name` of the access point in the map (e.g., “AP1”),
- `channel` of the access point (e.g., 3),
- `geometry` of the object of type `SDO_GEOMETRY`.

The size of individual cells of the mesh is 10x10 pixels.



Spatial Queries

1. What is the total area covered by the signal?
2. What is the total area where overlaps are covered by the signal?
3. What is the surface not covered by the signal?
4. Which buildings are covered by a signal.
5. Which buildings are covered by channel 3 and 9 respectively.
6. What is the total built-in area covered by the signal?

Java Viewer of Spatial Data

Implement a Java application to view the geometries in plans and maps as defined above. The applications should be able to print a human-readable description for each geometry in CLI and also view the plan or map in GUI.

To draw a geometry on a canvas of the Java GUI application, you can use `JGeometry.createShape()` method.

Solution

The solution of this lab can be found in the spatial SQL solution [../../download-oracle-lab-spatial-sql.zip] and spatial application solution [../../download-oracle-lab-spatial-app.zip] project.

Map View in Oracle SQL Developer

Map View [https://docs.oracle.com/en/database/oracle/sql-developer/18.3/rptug/sql-developer-concepts-usage.html#GUID-347742B8-722D-4C87-9187-F0E86ADCE2BC] can be used to visualize spatial data.

1. Run the Oracle SQL Developer and connect to an Oracle database server.
2. Open menu View / Map View.
3. In the Map View frame, select the database connection.
4. Run an SQL query (use Run Statement button) on spatial data or view data of a table with a spatial column.
5. Right click on a spatial value and in context menu select on of
    - Display geometry shape
    - Identify Geometry Shape in Map View
    - Invoke Map View on result set

To display results of another spatial query in the Map View, it is necessary to add new layer by (+) button there.