

# Oracle Autonomous Database Tools

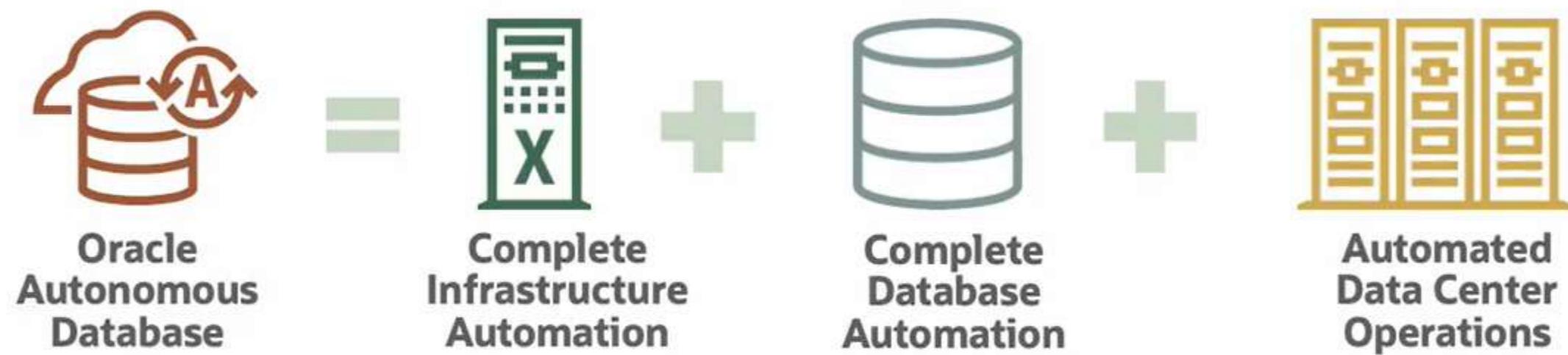
## Autonomous Database Tools Overview

**Hope Fisher**

PRODUCT MANAGER, DB CLOUD TECHNICAL SVCS & USER ASSISTANCE  
ORACLE

# Oracle Autonomous Database

Using the Cloud to eliminate the complexity of data management



## Autonomous Database

- Oracle Database reimaged for the Cloud
- Completely automating the full database management lifecycle
- Supporting mission-critical databases
- Enabling you to innovate more, pay less, and ensure data security

# Data Studio Tools

The screenshot shows the Oracle Data Studio Development interface. The top navigation bar includes the Oracle logo, Database Actions, Launchpad, a search bar, and a help icon. Below the navigation is a horizontal menu with tabs: Pinned & Recently Visited, Development (which is selected), Data Studio, Administration, Downloads, Monitoring, and Related Services. On the left, a sidebar lists various tools: SQL (selected), Data Modeler, REST, Liquibase, JSON, Charts, Scheduling, Oracle Machine Learning, and APEX. The main content area is titled "SQL" and contains a descriptive paragraph about the SQL worksheet's purpose. Below the text is a SQL worksheet window showing code and results. The code creates a table and inserts a row:

```
1 drop table demo_emps;
2 drop materialized view demo_emps_mv;
3
4 create table demo_emps (
5   id number primary key,
6   name varchar2(255),
7   sal number
8 );
9
10 insert into demo_emps values(1, 'martin', 100);
11
```

The results pane shows the inserted data:

NAME	MAX_SAL_CNT
MARTIN	100
SALINY	100

Elapsed: 00:00:09.004  
2 rows selected.

# Autonomous as a Development Environment

## Developer Tools out of the box with Autonomous

SQL Developer Web



- Execute SQL and PL/SQL
- Build Data Models, generate DDL statements
- Monitor and manage the DB

APEX



- Web-based Function rich, low code development env
- No client software needed

Oracle REST Data Services



- Ability to REST enable a schema and autogenerate REST endpoints for tables, views, and procedures

# SQL Developer

- Run SQL statements
- Load data
- Database development
- Monitor and manage

The screenshot shows the Oracle SQL Developer interface. The top navigation bar includes tabs for Pinned & Recently Visited, Development (which is selected), Data Studio, Administration, Downloads, Monitoring, and Related Services. On the left, a sidebar lists various tools: SQL (selected), Data Modeler, REST, Liquibase, JSON, Charts, Scheduling, Oracle Machine Learning, and APEX. The main workspace is titled "SQL" and contains a description: "The SQL worksheet is where most of your work will be performed. Running SQL queries and scripts, creating and browsing objects, loading data, exporting data to CSV or JSON, and so much more. Your day will often start and end in the SQL interface." Below this is a "Worksheet" window showing SQL code and its execution results. The code is as follows:

```
1 drop table demo_emps;
2 drop materialized view demo_emps_mv;
3
4 create table demo_emps (
5   id number primary key,
6   name varchar2(255),
7   sal number
8 );
9
10 insert into demo_emps values(1, 'martin', 180);
11
```

The "Query Result" tab shows the output of the last query:

NAME	MAX_SAL	COL1
martin	180	1
wally	200	1

Execution details: Elapsed: 00:00:00.004, 2 rows selected.

# APEX

- Access APEX Applications
- Manage workspaces
- APEX Development

The screenshot shows the Oracle APEX development interface. At the top, there is a navigation bar with tabs: Pinned & Recently Visited, Development (which is highlighted in green), Data Studio, Administration, Downloads, Monitoring, and Related Services. Below the navigation bar, there is a sidebar on the left containing links to various tools: SQL, Data Modeler, REST, Liquibase, JSON, Charts, Scheduling, Oracle Machine Learning, APEX (which is highlighted with a green vertical bar), and Graph Studio. The main content area is titled "APEX" and contains the sub-section "Login to APEX, develop and run rich, low-code web applications." It features four icons for App Builder, SQL Workshop, Team Development, and Gallery. Below these icons, there is a summary table with columns for Top Apps, Top Users, and Summary. The "Top Apps" row shows "1" under "Applications" and "Tables". The "Top Users" row shows "1" under "Developers". The "Summary" row shows "0" under "Applications", "0" under "Tables", and "1" under "Developers". To the right of the main content area, there is a sidebar with sections for About, Learn More, APEX Website, Blog, Tutorials, Videos, Educational Resources, Ideas & Feature Requests, apex.world, and Social. At the bottom right, there is a large "Open" button.

# REST

- Define via PL/SQL API, SQL Dev or APEX
- Auto REST enable tables and views
- Create custom REST services
- Document Store (SODA for REST)
- Database Management REST APIs
- REST Enabled SQL

The screenshot shows the Oracle Database Development interface. The top navigation bar includes links for Pinned & Recently Visited, Development (which is underlined), Data Studio, Administration, Downloads, Monitoring, and Related Services. On the left, there's a sidebar with icons for SQL, Data Modeler, REST (which is selected and highlighted in green), Liquibase, JSON, Charts, Scheduling, Oracle Machine Learning, APEX, and Graph Studio. The main content area is titled "REST" and contains the following text:

Develop, test, secure, and document REST APIs for your Oracle Database. Automatically REST enable access for your database objects, including:

- Tables
- Views
- PL/SQL Functions, Procedures, Packages

Build your own REST APIs using SQL and PL/SQL, secure endpoints with OAuth2 Clients or JSON Web Tokens, quickly share or test an API. Developer resources include:

- OpenAPI document generation
- Single-click API exports
- cURL command generation for shell and 3rd-party API testing tools

Documentation

[Creating REST APIs](#)  
[Securing REST APIs](#)

At the bottom right are two buttons: "Walk through" and "Open".

# JSON

- Create collection
- Load and edit JSON
- Browse documents
- Create views

The screenshot shows the Oracle Database Development interface. At the top, there is a navigation bar with tabs: Pinned & Recently Visited, Development (which is selected), Data Studio, Administration, Downloads, Monitoring, and Related Services. On the left, there is a sidebar with various icons and labels: SQL, Data Modeler, REST, Liquibase, JSON (which is highlighted with a blue border), Charts, Scheduling, Oracle Machine Learning, APEX, and Graph Studio. The main content area has a title "JSON" and a sub-section titled "The Oracle Database is more than a relational system for:". Below this, there is a bulleted list:

- Tables
- Rows
- Columns
- SQL

A descriptive text follows: "It also supports your JSON documents! This interface allows you to create a collection, load, edit, and browse documents, generate diagrams, and create relational Views and Indexes for your JSON for faster and easier queries." Below this text, there is a screenshot of the Oracle Database interface showing the "JSON Document Content" pane, which displays a large JSON document with many nested objects and arrays.

# SQLcl

- Modern command-line interface
- Auto complete SQL syntax
- Command history
- Output json, csv, html, inserts, xml...
- Liquibase schema lifecycle integration
- Scripting friendly
- No Oracle Home required
- OCI & OSS Integration

```
        "manager_id" : 101,
        "department_id" : 110,
        "column1" : ""
    },
    {
        "employee_id" : 206,
        "first_name" : "William",
        "last_name" : "Gietz",
        "email" : "WGIETZ",
        "phone_number" : "515.123.8181",
        "hire_date" : "07-JUN-94",
        "job_id" : "AC_ACCOUNT",
        "salary" : 17046.49,
        "commission_pct" : "",
        "manager_id" : 205,
        "department_id" : 110,
        "column1" : ""
    }
]
}
)
107 rows selected.

DEPARTMENT_ID      DEPARTMENT_NAME     EXTRA_COLUMN      LOCATION_ID      MANAGER_ID
SQL> select * from departments
2* where
```

SQL Command Line

# Data Studio Tools

The screenshot shows the Oracle Data Studio Overview page. The left sidebar contains navigation links: Overview, Data Load, Analysis, Insights, Catalog, and Data Share. The main content area is divided into sections:

- Get Started:** Contains four cards: Data Load, Data Analysis, Insights, and Catalog.
- Recent Objects:** A grid of recent database objects:
  - ROW1: DEVICES (TABLE), MONTHS (TABLE)
  - ROW2: ORDERS (TABLE), DAYS (TABLE)
  - ROW3: CUSTOMER\_INTERACTIONS (TABLE), COUNTRIES (TABLE)
  - ROW4: CUSTOMER\_CONTACT (TABLE), REQUEST\_INSIGHT\_5 (INSIGHT\_REQUEST)
  - ROW5: REQUEST\_INSIGHT\_4 (INSIGHT\_REQUEST), REQUEST\_INSIGHT\_3 (INSIGHT\_REQUEST)
- Getting Started:** Text: "Use Data Studio to understand your data better".
- Need Help?** Links: Data Load Documentation, Analysis Documentation, Catalog Documentation, Insights Documentation, Database Actions Documentation, Data Warehouse Insider Blog.

## Catalog

The screenshot shows the Oracle Database Actions interface, specifically the Catalog tab. The main panel displays a lineage graph for the table `MOVIE_SALES_2020Q2`. The graph shows various entities connected to the target table, with arrows indicating the flow of data. One entity, `MOVIE_SALES_2020Q2_MODEL`, has multiple arrows pointing to it from different source entities. A detailed view of this model entity is shown on the right side of the screen, listing its attributes: `DEPTH`, `MEMBER_CAPTION`, `MEMBER_DESCRIPTION`, `MEMBER_NAME`, `MEMBER_UNIQUE_NAME`, `PARENT_LEVEL_NAME`, `PARENT_UNIQUE_NAME`, and `GENRE`. The `MEMBER_DESCRIPTION` attribute is currently selected, indicated by a cursor icon. The left sidebar contains filters for recent objects, status (Valid, Invalid), partitioned status (Yes, No, Null), external status (Yes, No, Null), and sharded status (Yes, No). The top navigation bar includes tabs for Data Load, Data Analytics, Insights, Catalog, and Data Share.

# Insights

The screenshot displays the Oracle Database Actions Data Studio interface, specifically the Data Insights and Catalog sections.

**Data Insights Section:**

- Left Sidebar:** Shows recent objects: DEVICES, ORDERS, CUSTOMER\_INTERACTIONS, CUSTOMER\_CONTACT, REQUEST\_INSIGHT, and REQUEST\_INSIGHT\_X.
- Top Bar:** Includes links for Get Started, Data Load, Data Analysis, Insights (selected), Catalog, and Data Share.
- Central Area:** A search bar and a "Search for Insights" button. Below are two dropdown menus: Schema (set to QTEAM) and Analytic View/Table (set to MOVIE\_SALES\_2020Q2\_MODEL\_AV). A column dropdown is set to PURCHASES.
- Content Area:** Displays ten bar charts arranged in two rows of five. The top row includes: Drama (Customer Segment vs. PURCHASES), Midage Female (Genre vs. PURCHASES), Married with Children (Genre vs. PURCHASES), Comedy (Customer Segment vs. PURCHASES), and Young People (Genre vs. PURCHASES). The bottom row includes: Single Male (Genre vs. PURCHASES), Single Female (Genre vs. PURCHASES), Crime (Customer Segment vs. PURCHASES), Film-Noir (Customer Segment vs. PURCHASES), and Adventure (Customer Segment vs. PURCHASES).

**Catalog Section:**

- Top Bar:** Includes links for Get Started, Data Load, Data Analysis, Insights, Catalog (selected), and Data Share.
- Central Area:** Shows a preview of the MOVIE\_SALES\_2020Q2 table and its lineage. The lineage path starts from MOVIE\_SALES\_2020Q2\_MODEL\_AV, leading to REQUEST\_INSIGHT\_X, REQUEST\_INSIGHT, and finally MOVIE\_SALES\_2020Q2.
- Right Panel:** A detailed view of the MOVIE\_SALES\_2020Q2 table's structure, including columns like MEMBER\_CAPTION, MEMBER\_DEVICE, MEMBER\_NAME, MEMBER\_UNIQUE\_NAME, and PARENT\_LEVEL\_NAME.

# Machine Learning Notebooks

The screenshot displays the Oracle Machine Learning Notebooks interface, which integrates various Oracle Data Science tools. The main area shows two code snippets in Python:

```
import matplotlib.pyplot as plt
plt.style.use('seaborn')
plt.figure(figsize=(10,5))

sns.boxplot(iris, :4, notch=True,
            showmeans = True,
            labels=iris.columns[:4])

plt.title('Distribution of IRIS Attributes')

plt.ylabel('n')
```

```
sns.graphics.hist(iris['SEPAL_LENGTH'], bins=10, color='red',
                  linestyle='solid', edgecolor='black')

plt.title('Sepal length variation in IRIS data set')
plt.xlabel('Sepal length')
plt.ylabel('# of Iris instances')

plt.show()
```

Below the code are two generated plots: a box plot titled "Distribution of IRIS Attributes" and a histogram titled "Sepal length variation in IRIS data set". To the right of the notebook interface, there are three separate windows showing data insights:

- A "Search for Insights" window showing results for "Note 23 EA" and "OMLUSER".
- A "Data Insights" window displaying four bar charts for "CUSTOME...".
- A "Data Insights" window displaying four bar charts for "CUSTOME...".

# Graph Studio

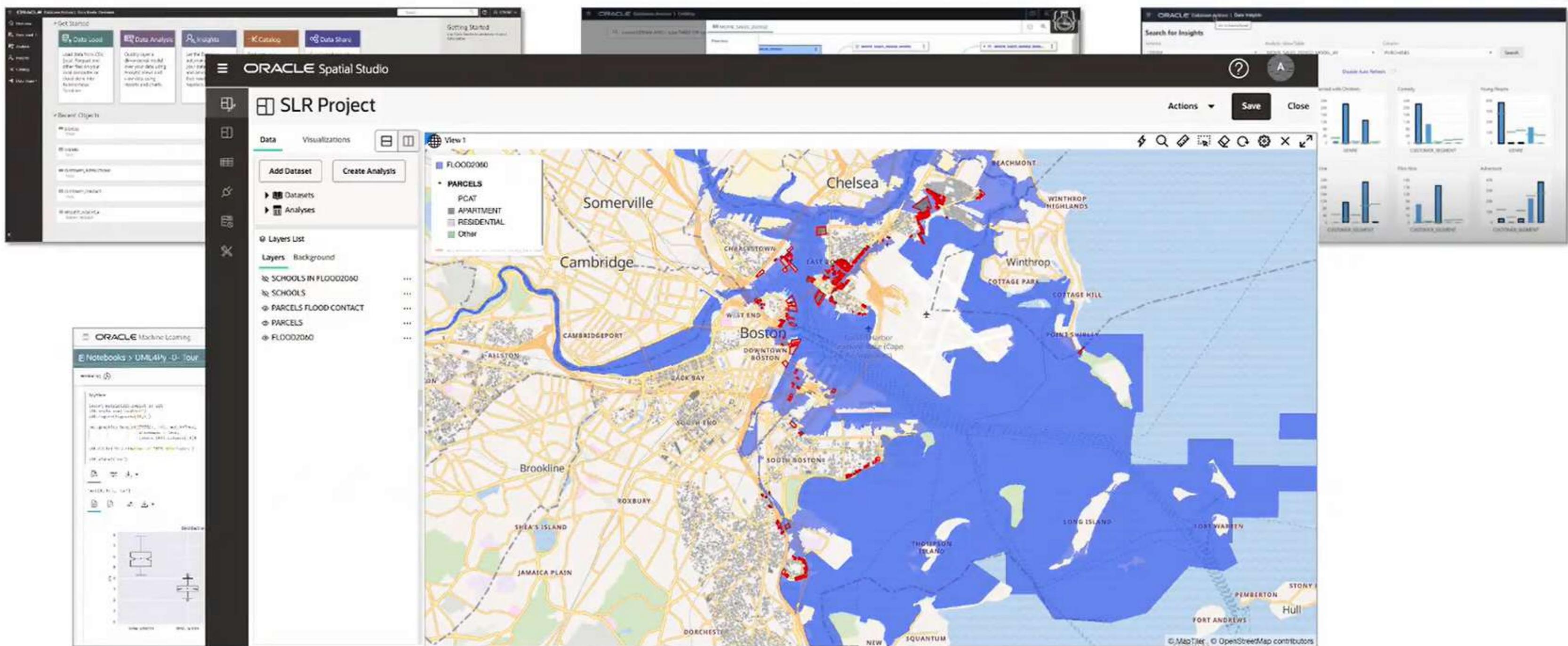
**Connections between Vertices - Emilio and Floyd's common movies**

```
%pgql-pgx
/* Find movies that both customers are connecting to */

select c1, e1, m.title, e2, c2
from match (c1)-[e1]->(m)<-[e2]-(c2)
on MOVIE_RECOMMENDATIONS
where c1.FIRST_NAME = 'Floyd' and c1.LAST_NAME = 'Bryant' and
c2.FIRST_NAME = 'Emilio' and c2.LAST_NAME = 'Welch'
limit 20
```

The figure displays a network graph with nodes representing individuals and edges representing shared interests. A prominent red node labeled "Emilio" is connected to a green node labeled "Floyd" through a dense cluster of blue nodes. The edges between nodes are thin grey lines, while the connections between "Emilio" and the central cluster, and between the central cluster and "Floyd", are thicker. The size of the nodes varies, suggesting a hub-and-spoke structure where "Emilio" and "Floyd" are central figures in this network. In the background, there are several overlapping windows of the Oracle Data Studio interface, including "Data Insights", "Data Share", and "Machine Learning". These windows show various data visualizations such as bar charts and tables, indicating the broader context of the graph analysis.

# Graph Studio



# Summary

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Describe ADB Tools