Hands-on Lab: Using Views

Estimated time needed: 10 minutes

In this lab, you will learn about using views. In SQL, a view is an alternative way of representing data that exists in one or more tables. Just like a real table, it contains rows and columns. The fields in a view are fields from one or more real tables in the database. Though views can be queried like a table, views are dynamic; only the definition of the view is stored, not the data.

How does the syntax of a CREATE VIEW statement look?

```
CREATE VIEW view_name AS
SELECT column1, column2, ...
FROM table_name
WHERE condition;
```

Copied!

How does the syntax of a REPLACE VIEW statement look?

```
CREATE OR REPLACE VIEW view_name AS
SELECT column1, column2, ...
FROM table_name
WHERE condition;
```

Copied!

How does the syntax of a DROP VIEW statement look?

```
DROP VIEW view_name;
```

Copied!

Software Used in this Lab

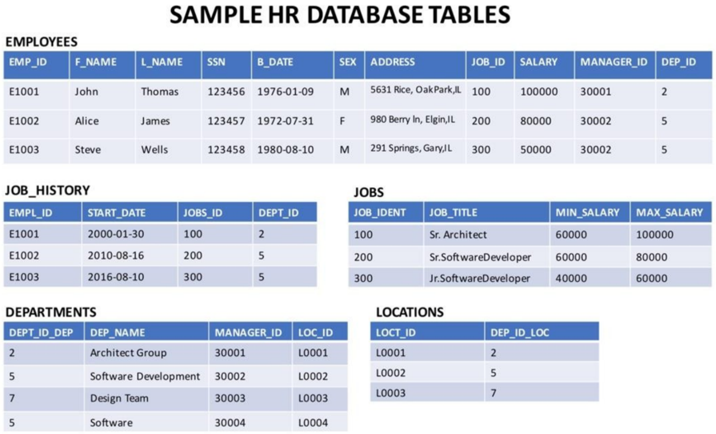
In this lab, you will use IBM Db2 Database. Db2 is a Relational Database Management System (RDBMS) from IBM, designed to store, analyze and retrieve the data efficiently.

To complete this lab you will utilize a Db2 database service on IBM Cloud. If you did not already complete this lab task earlier in this module, you will not yet have access to Db2 on IBM Cloud, and you will need to follow the lab below first:

- Hands-on Lab : Sign up for IBM Cloud, Create Db2 service instance and Get started with the Db2 console

Database Used in this Lab

The database used in this lab is an internal database. You will be working on a sample HR database. This HR database schema consists of 5 tables called **EMPLOYEES**, **JOB_HISTORY**, **JOBS**, **DEPARTMENTS** and **LOCATIONS**. Each table has a few rows of sample data. The following diagram shows the tables for the HR database:



SAMPLE HR DATABASE TABLES

EMPLOYEES

EMP_ID	F_NAME	L_NAME	SSN	B_DATE	SEX	ADDRESS	JOB_ID	SALARY	MANAGER_ID	DEP_ID
E1001	John	Thomas	123456	1976-01-09	M	5631 Rice, OakPark,IL	100	100000	30001	2
E1002	Alice	James	123457	1972-07-31	F	980 Berry ln, Elgin,IL	200	80000	30002	5
E1003	Steve	Wells	123458	1980-08-10	M	291 Springs, Gary,IL	300	50000	30002	5

JOB_HISTORY

EMPL_ID	START_DATE	JOBS_ID	DEPT_ID
E1001	2000-01-30	100	2
E1002	2010-08-16	200	5
E1003	2016-08-10	300	5

JOBS

JOB_IDENT	JOB_TITLE	MIN_SALARY	MAX_SALARY
100	Sr. Architect	60000	100000
200	Sr.SoftwareDeveloper	60000	80000
300	Jr.SoftwareDeveloper	40000	60000

DEPARTMENTS

DEPT_ID_DEP	DEP_NAME	MANAGER_ID	LOC_ID
2	Architect Group	30001	L0001
5	Software Development	30002	L0002
7	Design Team	30003	L0003
5	Software	30004	L0004

LOCATIONS

LOCT_ID	DEP_ID_LOC
L0001	2
L0002	5
L0003	7

NOTE: This lab requires you to have all 5 of these tables of the HR database populated with sample data on Db2. If you don't have the tables above populated with sample data on Db2, please go through the lab below first:

- Hands-on Lab : Create tables using SQL scripts and Load data into tables

Objectives

After completing this lab, you will be able to:

- Create a View and show a selection of data for a given table
- Update a View to combine two or more tables in meaningful ways
- Drop a created View

Instructions

When you approach the exercises in this lab, follow the instructions to run the queries on Db2:

- Go to the Resource List of IBM Cloud by logging in where you can find the Db2 service instance that you created in a previous lab under **Services** section. Click on the **Db2-xx service**. Next, open the Db2 Console by clicking on **Open Console** button. Click on the 3-bar menu icon in the top left corner and go to the **Run SQL** page. The Run SQL tool enables you to run SQL statements.
  - If needed, follow Hands-on Lab : Sign up for IBM Cloud, Create Db2 service instance and Get started with the Db2 console

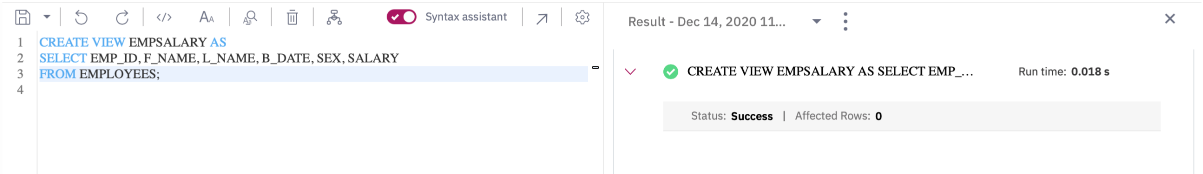
Exercise 1: Create a View

In this exercise, you will create a View and show a selection of data for a given table.

1. Let's create a view called **EMPSALARY** to display salary along with some basic sensitive data of employees from the HR database. To create the **EMPSALARY** view from the **EMPLOYEES** table, copy the code below and paste it to the textbox of the **Run SQL** page. Click **Run all**.

```
CREATE VIEW EMPSALARY AS
SELECT EMP_ID, F_NAME, L_NAME, B_DATE, SEX, SALARY
FROM EMPLOYEES;
```

Copied!



```
CREATE VIEW EMPSALARY AS
SELECT EMP_ID, F_NAME, L_NAME, B_DATE, SEX, SALARY
FROM EMPLOYEES;
```

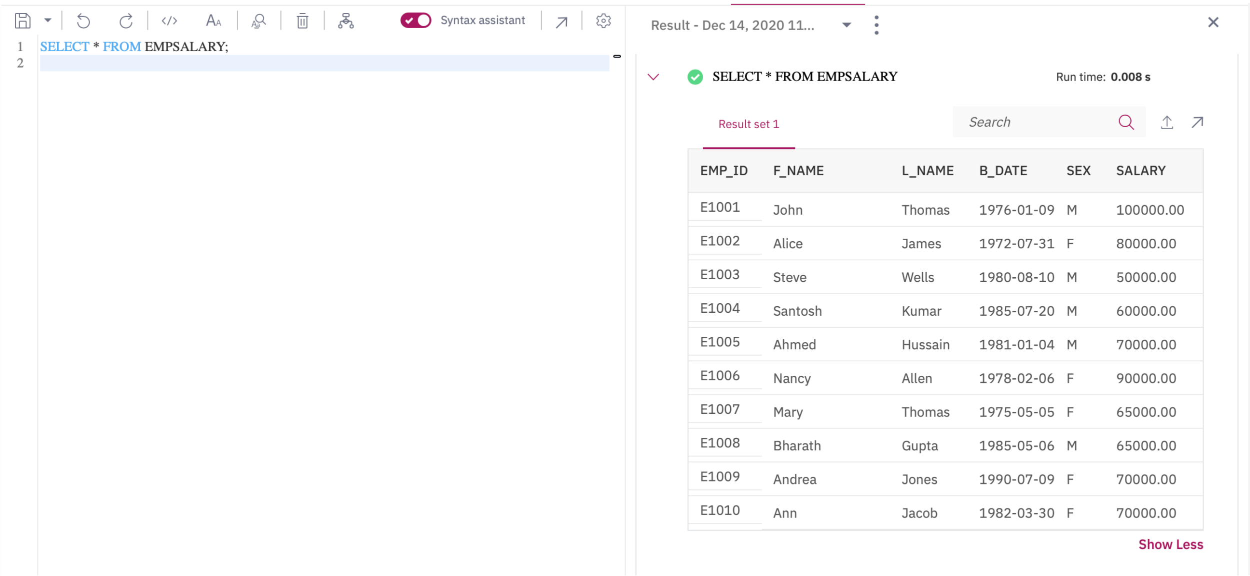
CREATE VIEW EMPSALARY AS SELECT EMP_... Run time: 0.018 s

Status: Success | Affected Rows: 0

2. Using SELECT, query the **EMPSALARY** view to retrieve all the records. Copy the code below and paste it to the textbox of the **Run SQL** page. Click **Run all**.

```
SELECT * FROM EMPSALARY;
```

Copied!



```
SELECT * FROM EMPSALARY;
```

SELECT * FROM EMPSALARY Run time: 0.008 s

EMP_ID	F_NAME	L_NAME	B_DATE	SEX	SALARY
E1001	John	Thomas	1976-01-09	M	100000.00
E1002	Alice	James	1972-07-31	F	80000.00
E1003	Steve	Wells	1980-08-10	M	50000.00
E1004	Santosh	Kumar	1985-07-20	M	60000.00
E1005	Ahmed	Hussain	1981-01-04	M	70000.00
E1006	Nancy	Allen	1978-02-06	F	90000.00
E1007	Mary	Thomas	1975-05-05	F	65000.00
E1008	Bharath	Gupta	1985-05-06	M	65000.00
E1009	Andrea	Jones	1990-07-09	F	70000.00
E1010	Ann	Jacob	1982-03-30	F	70000.00

Exercise 2: Update a View

In this exercise, you will update a View to combine two or more tables in meaningful ways.

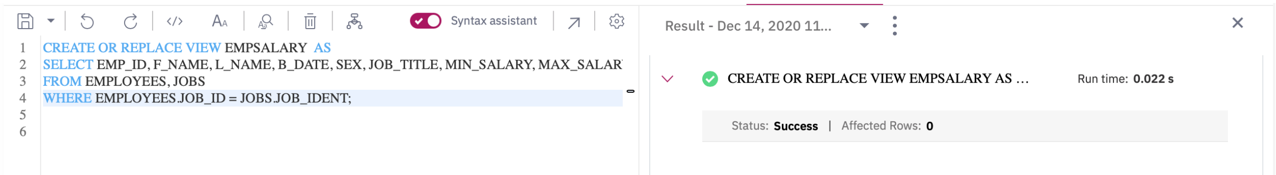
1. It now seems that the **EMPSALARY** view we created in exercise 1 doesn't contain enough salary information, such as max/min salary and the job title of the employees. Let's update the **EMPSALARY** view:
   - combining two tables **EMPLOYEES** and **JOBS** so that we can display our desired information from the HR database.
   - including the columns **JOB_TITLE, MIN_SALARY, MAX_SALARY** of the **JOBS** table as well as excluding the **SALARY** column of the **EMPLOYEES** table.

Copy the code below and paste it to the textbox of the **Run SQL** page. Click **Run all**.

```
CREATE OR REPLACE VIEW EMPSALARY  AS
SELECT EMP_ID, F_NAME, L_NAME, B_DATE, SEX, JOB_TITLE, MIN_SALARY, MAX_SALARY
FROM EMPLOYEES, JOBS
WHERE EMPLOYEES.JOB_ID = JOBS.JOB_IDENT;
```

Copied!

> **NOTE:** Don't worry if you don't understand how to combine to two tables using implicit inner join. You will learn more about joins later on. For now, just think you are combining the data of two different tables, **EMPLOYEES** and **JOBS** by connecting their respective columns **JOB_ID** and **JOB_IDENT** since both the columns contain common unique data. You can have a look at the diagram (at the beginning of the lab) showing the tables for the HR database to observe how the **JOB_ID** and **JOB_IDENT** columns from the **EMPLOYEES** and **JOBS** tables respectively contain common unique data.



```
CREATE OR REPLACE VIEW EMPSALARY  AS
SELECT EMP_ID, F_NAME, L_NAME, B_DATE, SEX, JOB_TITLE, MIN_SALARY, MAX_SALAR
FROM EMPLOYEES, JOBS
WHERE EMPLOYEES.JOB_ID = JOBS.JOB_IDENT;
```

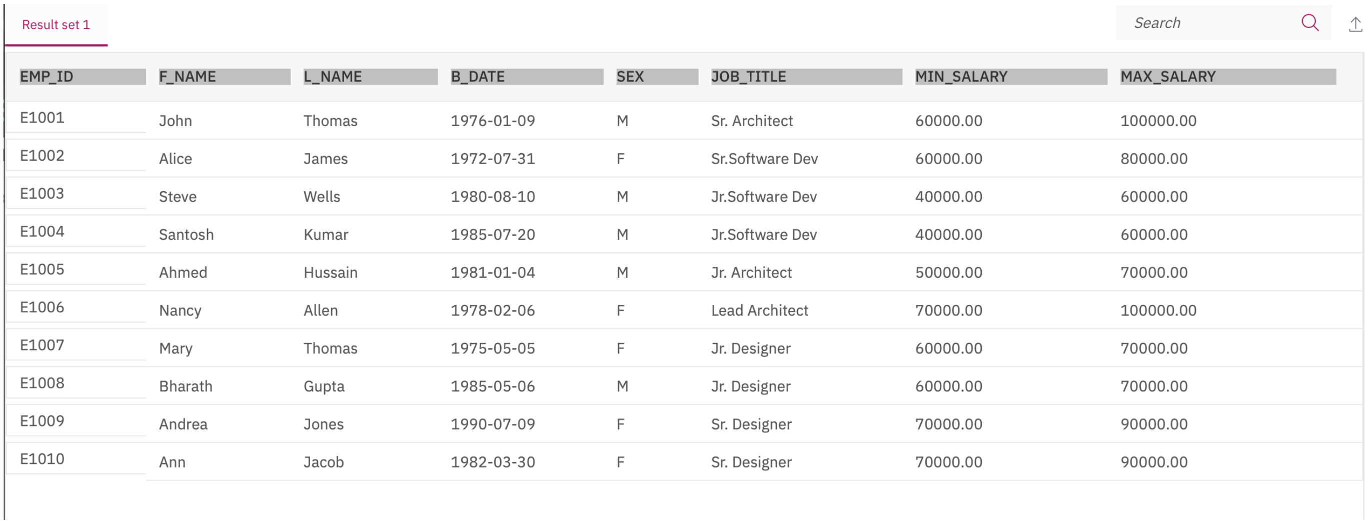
CREATE OR REPLACE VIEW EMPSALARY AS ... Run time: 0.022 s

Status: Success | Affected Rows: 0

2. Using SELECT, query the updated **EMPSALARY** view to retrieve all the records. Copy the code below and paste it to the textbox of the **Run SQL** page. Click **Run all**.

```
SELECT * FROM EMPSALARY;
```

Copied!



EMP_ID	F_NAME	L_NAME	B_DATE	SEX	JOB_TITLE	MIN_SALARY	MAX_SALARY
E1001	John	Thomas	1976-01-09	M	Sr. Architect	60000.00	100000.00
E1002	Alice	James	1972-07-31	F	Sr.Software Dev	60000.00	80000.00
E1003	Steve	Wells	1980-08-10	M	Jr.Software Dev	40000.00	60000.00
E1004	Santosh	Kumar	1985-07-20	M	Jr.Software Dev	40000.00	60000.00
E1005	Ahmed	Hussain	1981-01-04	M	Jr. Architect	50000.00	70000.00
E1006	Nancy	Allen	1978-02-06	F	Lead Architect	70000.00	100000.00
E1007	Mary	Thomas	1975-05-05	F	Jr. Designer	60000.00	70000.00
E1008	Bharath	Gupta	1985-05-06	M	Jr. Designer	60000.00	70000.00
E1009	Andrea	Jones	1990-07-09	F	Sr. Designer	70000.00	90000.00
E1010	Ann	Jacob	1982-03-30	F	Sr. Designer	70000.00	90000.00

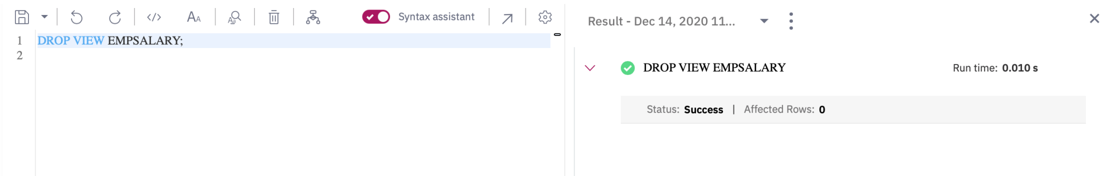
Exercise 3: Drop a View

In this exercise, you will drop a created View.

1. Let's delete the created **EMPSALARY** view. Copy the code below and paste it to the textbox of the **Run SQL** page. Click **Run all**.

```
DROP VIEW EMPSALARY;
```

Copied!



```
DROP VIEW EMPSALARY;
```

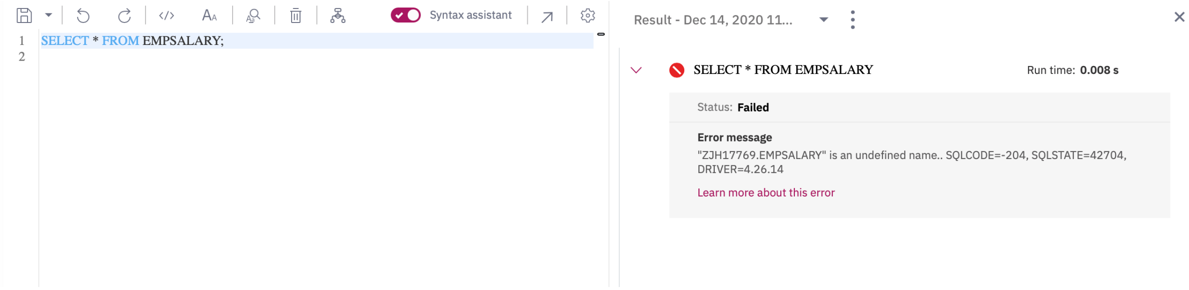
DROP VIEW EMPSALARY Run time: 0.010 s

Status: Success | Affected Rows: 0

2. Using SELECT, you can verify whether the **EMPSALARY** view has been deleted or not. Copy the code below and paste it to the textbox of the **Run SQL** page. Click **Run all**.

```
SELECT * FROM EMPSALARY;
```

Copied!



```
SELECT * FROM EMPSALARY;
```

SELECT * FROM EMPSALARY Run time: 0.008 s

Status: Failed

Error message
"ZJH17769.EMPSALARY" is an undefined name.. SQLCODE=-204, SQLSTATE=42704, DRIVER=4.26.14

Learn more about this error

Congratulations! You have completed this lab, and you are ready for the next topic.

Author(s)

- Sandip Saha Joy

Other Contributor(s)

-