



# Hands-on Lab: Create Tables using SQL Scripts and Load Data into Tables

Estimated time needed: 30 minutes

In this lab, you will learn how to run SQL scripts to create several tables at once, as well as how to load data into tables from .csv files.

## 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 this lab 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**, **JOB**, **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	JOB_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

## Objectives

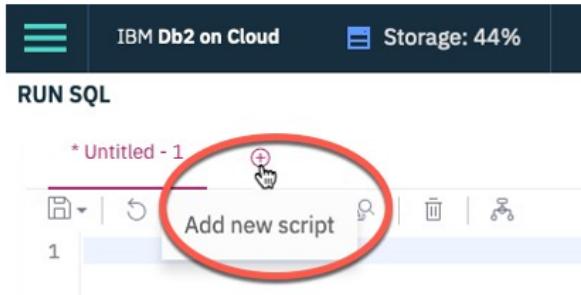
After completing this lab, you will be able to:

- Create tables using SQL scripts
- Load data into tables

## Exercise 1: Create tables using SQL scripts

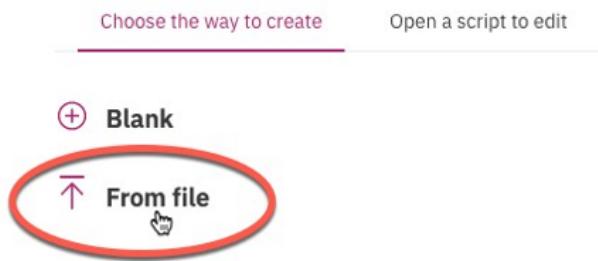
In this exercise, you will learn how to execute a script containing the CREATE TABLE commands for all the tables rather than create each table manually by typing the DDL commands in the SQL editor.

1. Download the script file to your computer:
  - o [HR\\_Database\\_Create\\_Tables\\_Script.sql](#)
2. Login to IBM Cloud and go to the [Resource List](#) 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.
3. Click on the + (Add New Script) icon.



4. Click on **From file**.

## Add new script



5. Locate the file **HR\_Database\_Create\_Tables\_Script.sql** that you downloaded to your computer earlier and open it.
6. Once the statements are in the SQL Editor tool , you can run the queries against the database by selecting the **Run All** button.

The screenshot shows the IBM Db2 on Cloud interface. At the top, there's a header bar with the IBM logo, 'IBM Db2 on Cloud', and 'Storage: 44%'. Below the header is a 'RUN SQL' section. On the left, there's a code editor window titled 'Untitled - 1' containing SQL DDL statements for creating tables. On the right, there's a 'Result' section showing the execution status of the queries.

```

1 * Untitled - 1      * Script_Create_Table...  x
2   Script_Create_Table...
3
4
5 CREATE TABLE EMPLOYEES (
6     EMP_ID CHAR(9) NOT NULL,
7     F_NAME VARCHAR(15) NOT NULL,
8     L_NAME VARCHAR(15) NOT NULL,
9     SSN CHAR(9),
10    B_DATE DATE,
11    SEX CHAR,
12    ADDRESS VARCHAR(30),
13    JOB_ID CHAR(9),
14    SALARY DECIMAL(10,2),
15    MANAGER_ID CHAR(9),
16    DEP_ID CHAR(9) NOT NULL,
17    PRIMARY KEY (EMP_ID));
18
19 CREATE TABLE JOB_HISTORY (
20     EMPL_ID CHAR(9) NOT NULL,
21     START_DATE DATE,

```

**Run all**



Remember my last behavior

7. On the right side of the SQL editor window you will see a Result section. Clicking on a query in the Result section will show the execution details of the job like whether it ran successfully, or had any errors or warnings. Ensure your queries ran successfully and created all the tables.

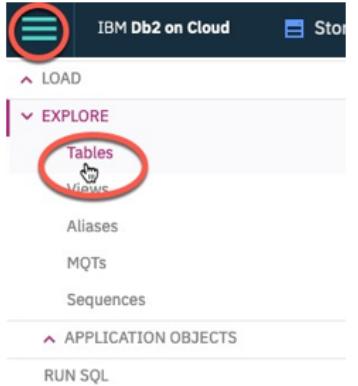
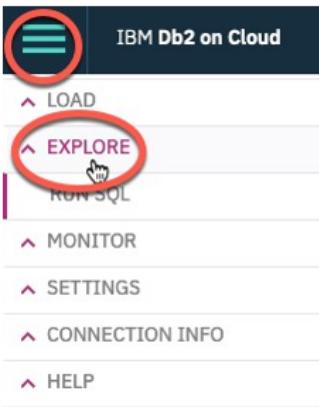
- **Note:** You may see several errors before the successful creation of the tables. These errors relate to the dropping (removal) of any pre-existing version of these tables. You can ignore these errors.

#### RUN SQL

The screenshot shows the IBM Db2 on Cloud interface with the 'RUN SQL' section expanded. The code editor on the left contains the same SQL DDL statements as the previous screenshot. To the right, the 'Result' section is expanded, showing the execution details for each query. Each query is listed with its status (Success), run time, and affected rows. The first query has a status of 'Success' with 0 affected rows and a run time of 0.201s.

Query	Status	Affected Rows	Run time
CREATE TABLE EMPLOYEES ( ... )	Success	0	0.201s
CREATE TABLE JOB_HISTORY ( ... )	Success	0	0.191s
CREATE TABLE JOBS ( ... )	Success	0	0.194s
CREATE TABLE DEPARTMENT ( ... )	Success	0	0.207s
CREATE TABLE LOCATIONS ( ... )	Success	0	0.181s

8. Now you can look at the tables you created. Navigate to the 3-bar menu icon in the top left corner, select **Explore**, and then click on **Tables**.



9. Select the Schema corresponding to your Db2 userid. It typically starts with 3 letters (not SQL) followed by 5 numbers (but will be different from the **QWX76809** example below). Then on the right side of the screen you should see the 5 newly created tables listed – DEPARTMENTS, EMPLOYEES, JOBS, JOB\_HISTORY and LOCATIONS (plus any other tables you may have created in previous labs e.g. PETSALE, PETRESCUE, etc.).

## TABLES

Schemas		Tables	
<input type="checkbox"/> <b>AUDIT</b> 0 table	<input type="checkbox"/> <b>DEPARTMENTS</b>	<input type="checkbox"/> <b>NAME</b> ▾	<input type="checkbox"/> <b>DEPARTMENTS</b> QWX76809 ...
<input type="checkbox"/> <b>DB2INST1</b> 0 table	<input type="checkbox"/> <b>EMPLOYEES</b>	<input type="checkbox"/> <b>EMPLOYEES</b>	<input type="checkbox"/> <b>EMPLOYEES</b> QWX76809 ...
<input type="checkbox"/> <b>ERRORSCHEMA</b> 0 table	<input type="checkbox"/> <b>JOBS</b>	<input type="checkbox"/> <b>JOBS</b>	<input type="checkbox"/> <b>JOBS</b> QWX76809 ...
<input type="checkbox"/> <b>IDAX</b> 0 table	<input type="checkbox"/> <b>JOB_HISTORY</b>	<input type="checkbox"/> <b>JOB_HISTORY</b>	<input type="checkbox"/> <b>JOB_HISTORY</b> QWX76809 ...
<input checked="" type="checkbox"/> <b>QWX76809</b> 0 table	<input type="checkbox"/> <b>LOCATIONS</b>	<input type="checkbox"/> <b>LOCATIONS</b>	<input type="checkbox"/> <b>LOCATIONS</b> QWX76809 ...
<input type="checkbox"/> <b>SQL15777</b> 0 table	<input type="checkbox"/> <b>TEST</b>	<input type="checkbox"/> <b>TEST</b>	<input type="checkbox"/> <b>TEST</b> QWX76809 ...
<input type="checkbox"/> <b>SQL15876</b> 0 table			
<input type="checkbox"/> <b>SQL67871</b> 0 table			
<input type="checkbox"/> <b>SQL86467</b> 0 table			
<input type="checkbox"/> <b>SQL89190</b> 0 table			
<input type="checkbox"/> <b>SQL92220</b> 0 table			
Total: 14, selected: 1		Total: 6, selected: 0	

10. Click on any of the tables and you will see its Table Definition (that is, its list of columns, data types, etc).

The screenshot shows the 'Tables' section of the IBM Db2 on Cloud interface. On the left, there's a list of tables with checkboxes: DEPARTMENTS, EMPLOYEES, JOBS, JOB\_HISTORY, LOCATIONS, and TEST. The 'DEPARTMENTS' table is selected, indicated by a pink highlight. To its right is a 'PROPERTIES' panel showing the table name as QWX76809 ... and a 'Table Definition' panel for the 'DEPARTMENTS' table. The 'Table Definition' panel includes a header row and four data rows:

COLU...	DATA T...	NUL...	LEN...	SCA...
DEPT_ID_...	CHAR	N	9	0
DEP_NAME	VARCHAR	Y	15	0
MANAGER...	CHAR	Y	9	0
LOC_ID	CHAR	Y	9	0

## Exercise 2: Load data into tables

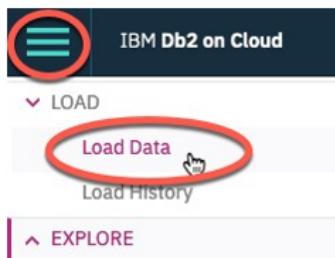
In this exercise, you will learn how data can be loaded into Db2. You could manually insert each row into the table one by one, but that would take a long time. Instead, Db2 (and almost every other database) allows you to load data from .CSV files.

The steps below explain the process of loading data into the tables you created earlier in exercise 1.

1. Download the 5 .csv files below to your local computer:

- [Departments.csv](#)
- [Employees.csv](#)
- [Jobs.csv](#)
- [Locations.csv](#)
- [JobsHistory.csv](#)

2. In the Db2 Console, from the 3-bar menu icon in the top left corner, click **Load**, and then select **Load Data**.



3. On the **Load Data** page that opens, ensure **My Computer** is selected as the source. Click on the **browse files** link.

LOAD DATA

The screenshot shows the 'Source' tab of the 'LOAD DATA' interface. On the left, there's a sidebar with options like 'My Computer' (circled in red), 'Amazon S3', 'Cloud Object Storage', 'Netezza and large CSV file migrations', and 'Lift'. The main area is titled 'File selection' and contains a dashed box with a file icon and a plus sign. Below it is the text 'Drag a file here or [browse files](#)' (also circled in red). At the bottom left is a toggle switch labeled 'High-speed loads powered by Aspera'. In the bottom right corner is a 'Next' button.

- Choose the file **Employees.csv** that you downloaded to your computer and click **Open**.

The screenshot shows a Mac OS X Finder window. The title bar says 'File selection'. The main pane is titled 'Today' and contains files: 'Departments', 'Employees' (highlighted with a red circle), 'Jobs', 'JobsHistory', 'Locations', and 'Script\_Create\_Tables.sql'. The sidebar on the left shows 'Favorites' with icons for iCloud Drive, Applications, Desktop, Documents, and Downloads. At the top right, there's a search bar with 'Lab4' typed into it.

- Once the File is selected, click **Next** in the bottom right corner.

## LOAD

You are loading the file **Employees.csv**

**Source** Target Define Finalize

**File selection**

Drag a file here or [browse files](#)

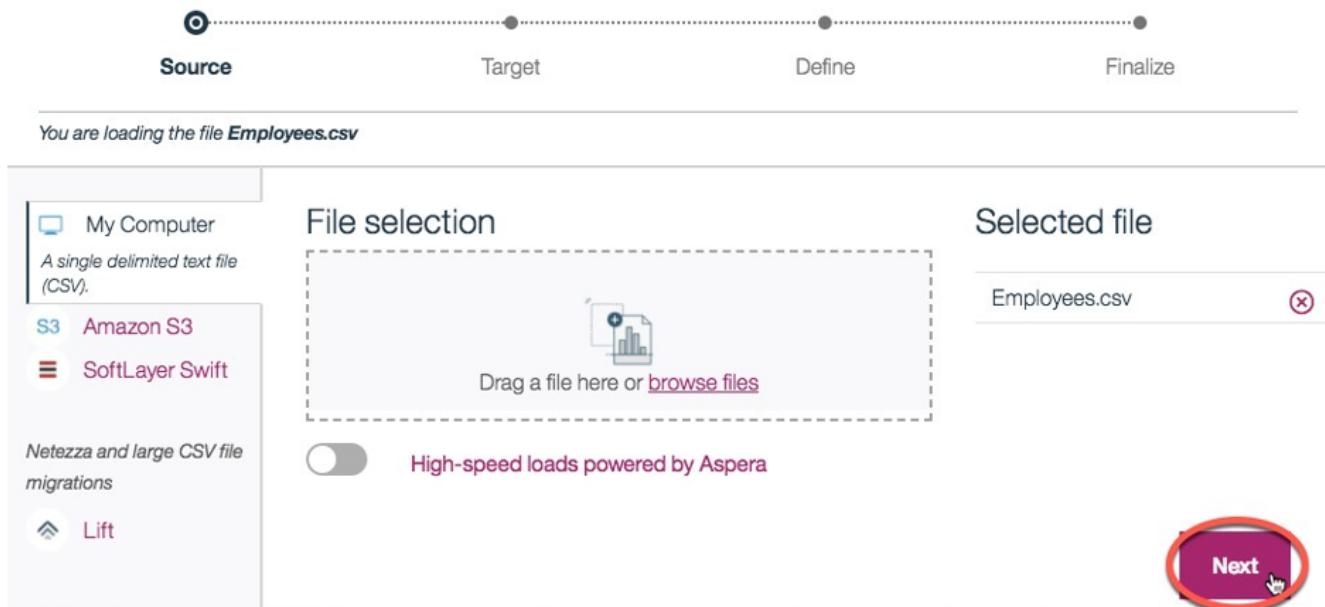
**Selected file**

Employees.csv [X](#)

**High-speed loads powered by Aspera**

**Lift**

**Next**



6. Select the schema for your Db2 Userid (the one where you created the tables earlier). If there are several schemas in the list and you cannot see your Db2 schema, then scroll down the list until you see your schema, and select it.

### Select a load target

Schema [Refresh](#)

[Find a schema](#)

AUDIT DB2INST1 ERRORSHEMA Sample

[New Schema](#)



### LOAD DATA

Source Target Define Finalize

You are loading the file **Employees.csv**

**Select a load target**

Schema [Refresh](#)

[Find a schema](#)

ERRORSHEMA IDAX QWX76809

[New Schema](#)

[Back](#) [Next](#)



7. It will show all the tables that have been created in this schema previously, including the Employees table. Select the **EMPLOYEES** table, and in the new Table Definition tab that appears, choose **Overwrite table with new data** (note the warning message), then click **Next**.

## LOAD DATA

You are loading the file **Employees.csv** into **QWX76809.EMPLOYEES**

Select a load target

**Table definition**  
**EMPLOYEES** Updated on 3/6/2020 at 4:08:09 PM  
 Append new data  
 Overwrite table with new data  
All existing data will be deleted from the table whether or not the loading action completes successfully.

**Schema**   
 Find a schema   
 IDAX  
**QWX76809**   
 QWICLOUD

**Table**   
 Find a table in **QWX76809**   
 DEPARTMENTS  
**EMPLOYEES**     
 JOBS

**Table definition**  
**EMPLOYEES** Updated on 3/6/2020 at 4:08:09 PM  
 Append new data  
 Overwrite table with new data  
All existing data will be deleted from the table whether or not the loading action completes successfully.

**COLUMN** **DATA TYPE** **NULLABLE**

**Back** **Next**

8. Since the source data files do not contain any rows with column labels, **turn off** the setting for **Header in first row**. Also, click on the down arrow next to **Date format** and choose **MM/DD/YYYY** since that is how the date is formatted in the source file.

You are loading the file **Employees.csv** into **QCM54853.EMPLOYEES**

Code page (character encoding): **1208 (UTF-8)** Separator: ,  
 Header in first row:  Time & date format:

Date format: **MM/DD/YYYY** Time format: HH:MM:SS  
 Timestamp format: YYYY-MM-DD HH:MM:SS

	<b>EMP_ID</b> CHARACTER	<b>F_NAME</b> VARCHAR	<b>L_NAME</b> VARCHAR	<b>SSN</b> CHARACTER	<b>B_DATE</b> DATE	<b>SEX</b> CHARACTER	<b>ADDRESS</b> VARCHAR
1	E1001	John	Thomas	123456	01/09/1976	M	"5631 Rice
2	E1002	Alice	James	123457	07/31/1972	F	980 Berry Ln, Elgin,IL
3	E1003	Steve	Wells	123458	08/10/1980	M	291 Springs, Gary,IL
4	E1004	Santosh	Kumar	123459	07/20/1985	M	511 Aurora Av, Aurora,IL
5	E1005	Ahmed	Hussain	123410	01/04/1981	M	216 Oak Tree, Geneva,IL
6	E1006	Nancy	Allen	123411	02/06/1978	F	111 Green Pl, Elgin,IL
7	E1007	Mary	Thomas	123412	05/05/1975	F	100 Rose Pl, Gary,IL
8	E1008	Bharath	Gupta	123413	05/06/1985	M	145 Berry Ln, Naperville,IL
9	E1009	Andrea	Jones	123414	07/09/1990	F	120 Fall Creek, Gary,IL
10		Ann		1415	09/08/82		100 Any Sp <sup>1</sup> Elgin,IL

**Back** **Next**

9. Click **Next**. Review the load settings and click **Begin Load** in the bottom right corner.

## Review settings

**Summary**

Code page: 1208 *(Default)*

Separator: , *(Default)*

Header in first row: No

Time format: HH:MM:SS *(Default)*

Date format: MM/DD/YYYY

Timestamp format: YYYY-MM-DD HH:MM:SS *(Default)*

String delimiter: " *(Default)*

**Option**

Maximum number of warnings  
 1000

**Back** **Begin Load**

10. After loading has completed, you will notice that you were successful in loading all 10 rows of the Employees table. If there are any **Errors** or **Warnings**, you can see them on this screen.

## Load details

**Status** **Settings**

**Errors 0** **Warnings 0**

The data load job succeeded.  
You can now work with your data.

10 10 0  
Rows read Rows loaded Rows rejected  
Start time 05/02/2018 1:51:27 PM  
End time 05/02/2018 1:51:28 PM

No errors

11. You can see the data that was loaded by clicking on **View Table**. Alternatively, you can go to **3-bar menu icon > Explore > Tables** and select the correct Schema. Then click on the **EMPLOYEES** table. Click **View Data** at the bottom.

## QCM54853.EMPLOYEES

Delete Table Export to CSV

	EMP_ID CHARACTER(9)	F_NAME VARCHAR(15)	L_NAME VARCHAR(15)	SSN CHARACTER(9)	B_DATE DATE	SEX CHARACTER(1)	ADDRESS VARCHAR(30)	JOB_ID CHARACTER(9)
1	E1001	John	Thomas	123456	1976-01-09	M	5631 Rice, OakPark, 100	
2	E1002	Alice	James	123457	1972-07-31	F	980 Berry Ln, Elgin,IL 200	
3	E1003	Steve	Wells	123458	1980-08-10	M	291 Springs, Gary,IL 300	
4	E1004	Santosh	Kumar	123459	1985-07-20	M	511 Aurora Av, Aurora 400	
5	E1005	Ahmed	Hussain	123410	1981-01-04	M	216 Oak Tree, Geneva 500	
6	E1006	Nancy	Allen	123411	1978-02-06	F	111 Green Pl, Elgin,IL 600	
7	E1007	Mary	Thomas	123412	1975-05-05	F	100 Rose Pl, Gary,IL 650	
8	E1008	Bharath	Gupta	123413	1985-05-06	M	145 Berry Ln, Naper 660	
9	E1009	Andrea	Jones	123414	1990-07-09	F	120 Fall Creek, Gary, 234	
10	E1010	Ann	Jacob	123415	1982-03-30	F	111 Britany Springs,E 220	

12. Now it's your turn to load data to the remaining 4 tables of the HR database – **LOCATIONS**, **JOB\_HISTORY**, **JOBs**, and **DEPARTMENTS** from the remaining source files.

13. Click **Load More Data** and then follow the steps from **Step 3** above again to load the remaining 4 tables. **IMPORTANT** Make sure you perform the steps in **Step 8** for each of the 4 remaining file loads.

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

## Author(s)

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## Other Contributor(s)

-

## Changelog

Date	Version	Changed by	Change Description
2020-12-23	2.1	Steve Ryan	ID Review
2020-12-08	2.0	Sandip Saha Joy	Created revised version from DB0201EN
2020	1.0	Rav Ahuja	Created initial version

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