Access external schema from SAP Business Application Studio

Applies to:
This article applies how to access external schema from a HDI container using user provided service in Business Application Studio.

Summary:

This document aims at accessing external schema from a HDI container using user provided service of cloud foundry in Business Application Studio. Developers, who are having basic HANA cloud database development knowledge can easily perform the task. An HDI container is a service layer of the SAP HANA Database that manages dependencies, executes as a transaction, and consists of schemata and a set of users that together allow an isolated deployment of database artifacts. SAP HANA HDI container consists of a design-time container and a corresponding run-time container. Database schema abstracted by HDI container and should only be accessed via container. HDI containers ensure isolation, and within an SAP HANA database you can define an arbitrary number of HDI containers. The same objects can be deployed multiple times into different HDI containers in the same SAP HANA database. HDI containers are isolated from each other by means of schema-level access privileges. Cross-container access at the database level is prevented by default but can be enabled by explicitly granting the necessary privileges, for example, using synonyms.

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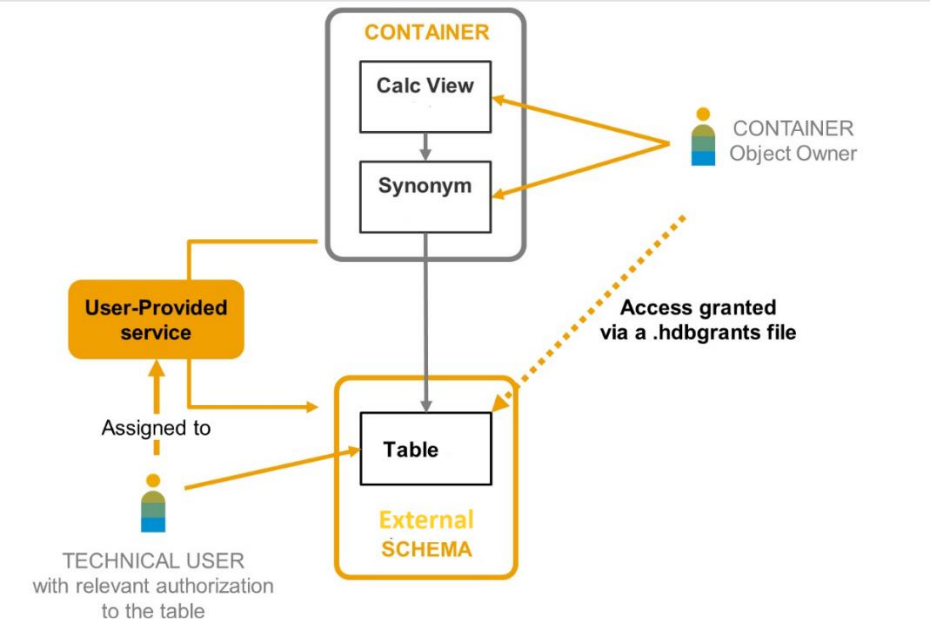
BUSINESS REQUIREMENT

In Business Application Studio there would be a need to access the external schemas and the HANA artifacts in the same. The external schema could be ABAP tables replicated in HANA schema or any data staging schemas in data warehouse HANA instance or could be schemas where different database tables are stored. By default, a container has full access to all of the database objects it contains (tables, calculation views, and so on), but has no access at all to other database schemas, whether it's another container's schema or a classic database schema. There would be requirement to access all these database artifacts in HDI containers which only allow access to local objects by default. The database artifacts, which are foreign objects to HDI container, can only be accessed by synonyms.

To enable access to external schema you need a user-provided service. This can be created in SAP Business Application Studio. You simply choose the name of the service and a user id and password that has privileges to all external objects that you wish to access through the service. These privileges in turn will be granted by this service user, to the container's technical user and application users using a .hdbgrants file.

In HDI, database schema content (for example, tables, views, procedures, etc.) is defined in corresponding design-time files as part of a development project. These definition artifacts are pushed to the platform as part of the HDI Deployer application @sap/hdi-deploy, which is a Node.js application that is publicly available for use in Cloud Foundry. This deployer application binds to an SAP HANA service instance and, on startup, creates the set of database objects that correspond to the pushed definition files.



OVERVIEW

This document aims at accessing external schema from a HDI container using user provided service of cloud foundry in Business Application Studio.

- **Create a schema in the HANA Cloud instance of SAP BTP.**
- **Create user provided service and access table using synonym.**

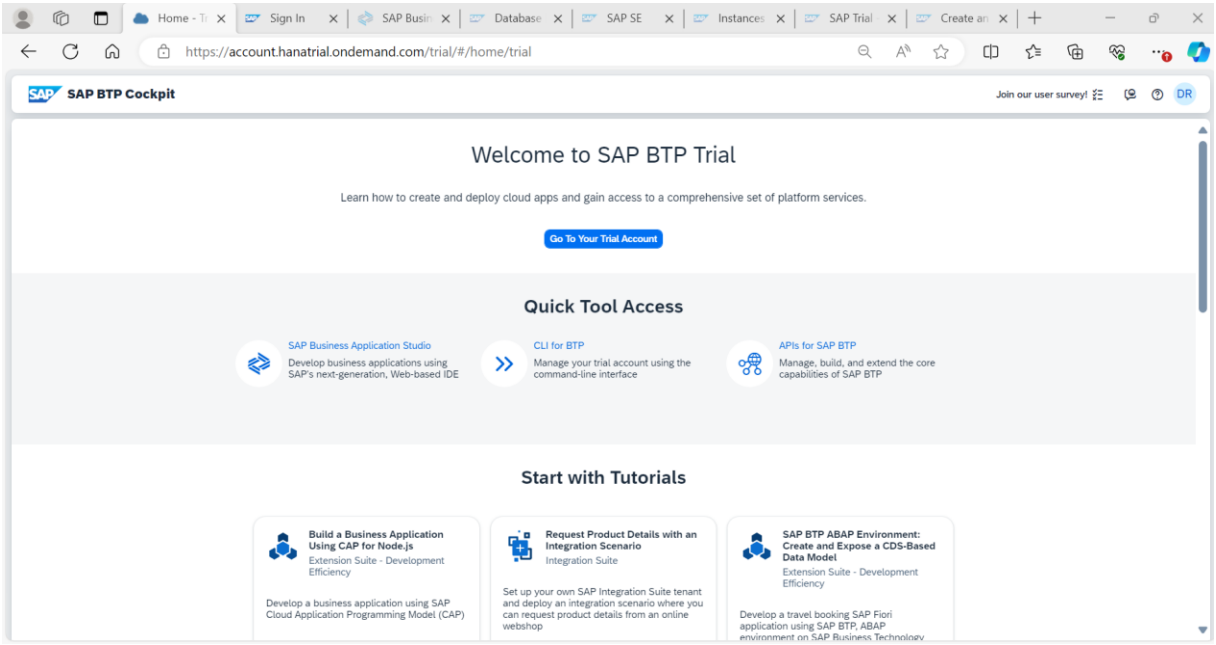
PROCESS & TOOLS USED;

SAP HANA Cloud in BTP and a HANA database project created in Business Application Studio.

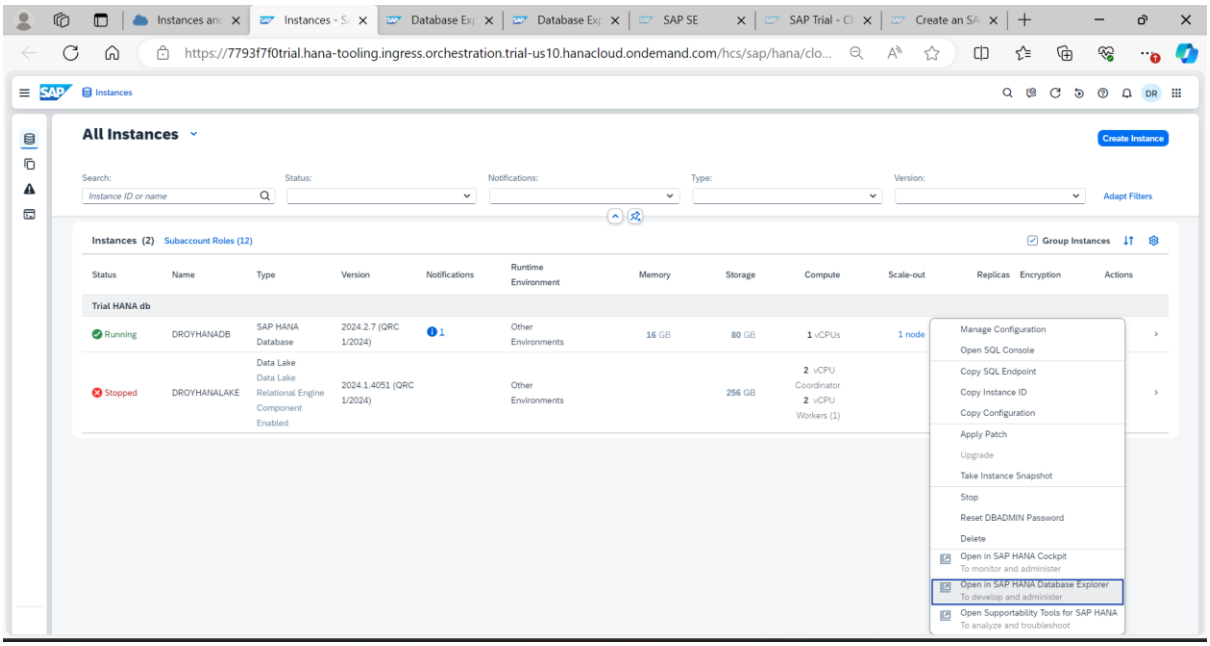
SOLUTIONS:

The following is the demonstration of accessing external schema from a HDI container using user provided service of cloud foundry in Business Application Studio.

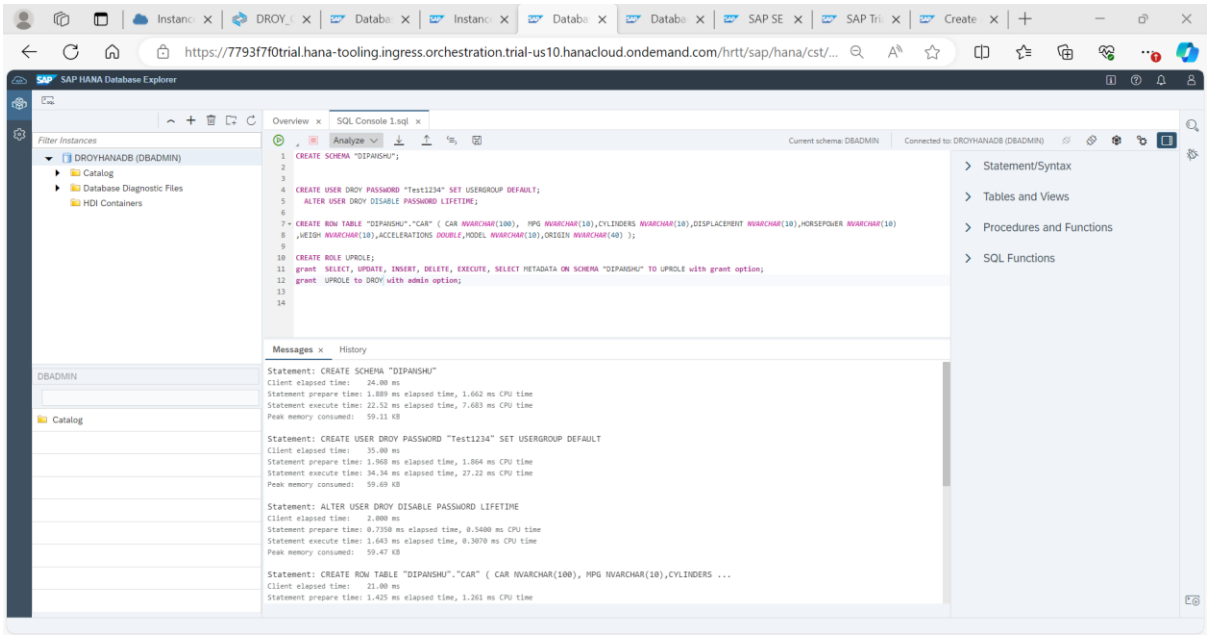
Login to BTP trial account and go to SAP HANA Cloud central and then go to the subaccount which is ‘trial’ in this case. If the HANA database instance is stopped then that needs to be started. After few minutes the status of the db instance would change from ‘starting’ to ‘running’.



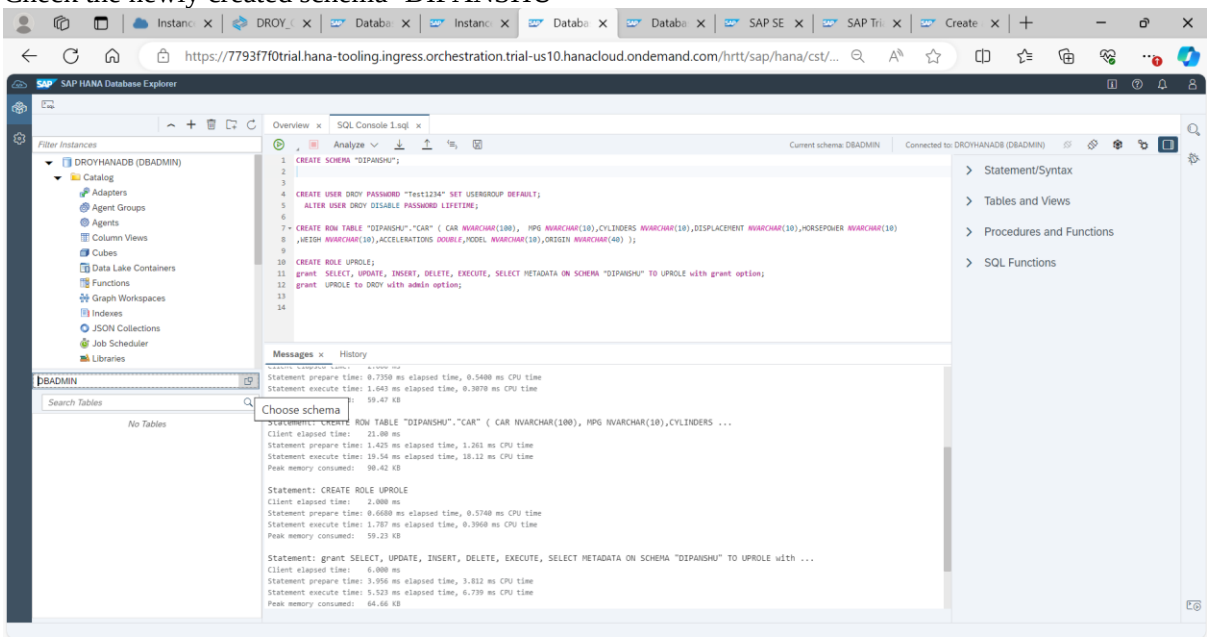
From SAP BTP cockpit and the HANA Cloud Management screen. Choose Open SAP HANA Database Explorer from the Actions column.

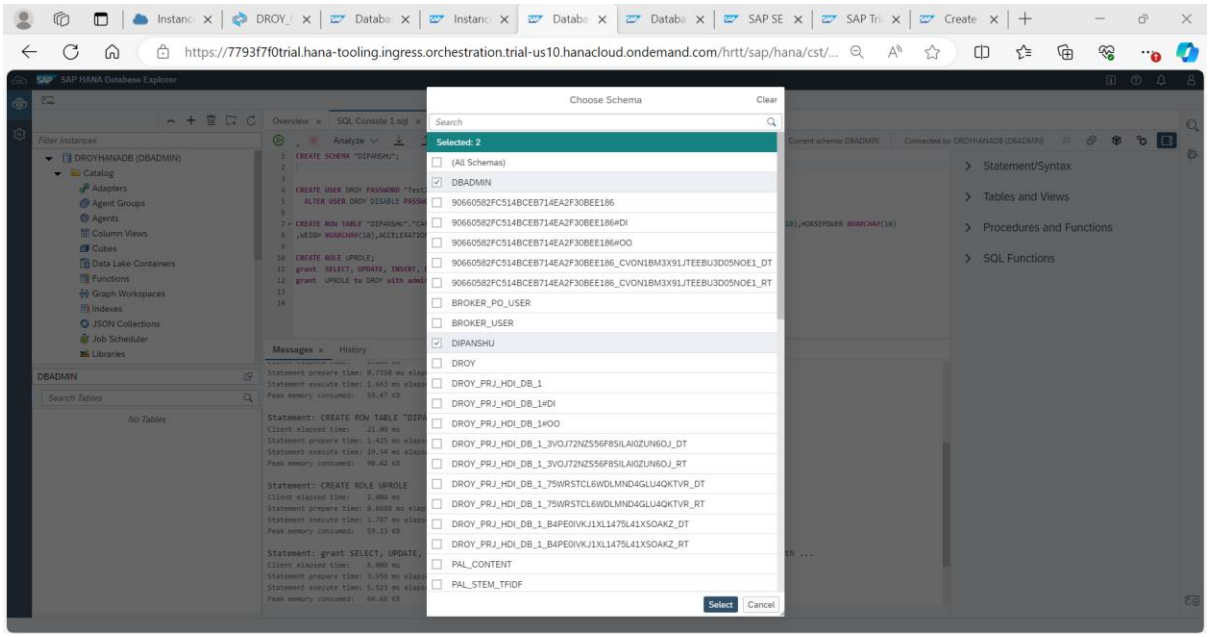


The Database Explorer will open in another browser tab and the DB entry for your DBADMIN user will be selected. Choose Open SQL Console from the context menu and execute following SQL in the console, The SQL code will create a schema and a user. It will also create a table in for cross container access demonstration. This will also create a SQL role and assign it to the user DROY with the permissions granted manually before. This user will be used for the connection between the HDI container and the external schema, and will grant the role to the HDI container technical user.

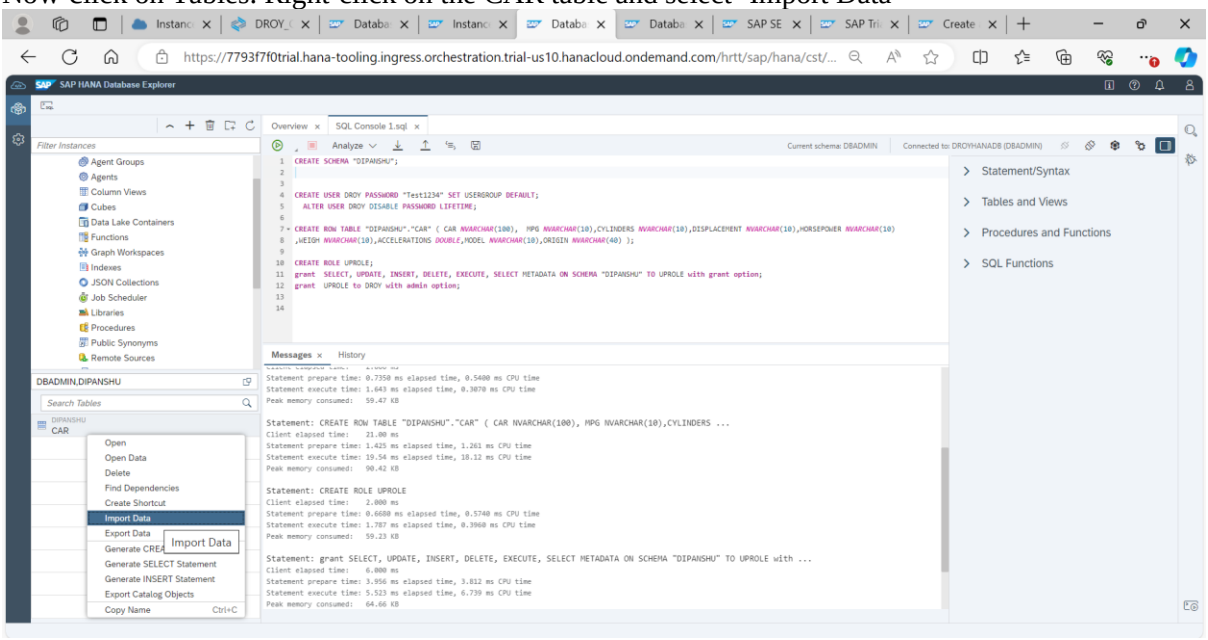


Check the newly created schema ‘DIPANSHU’

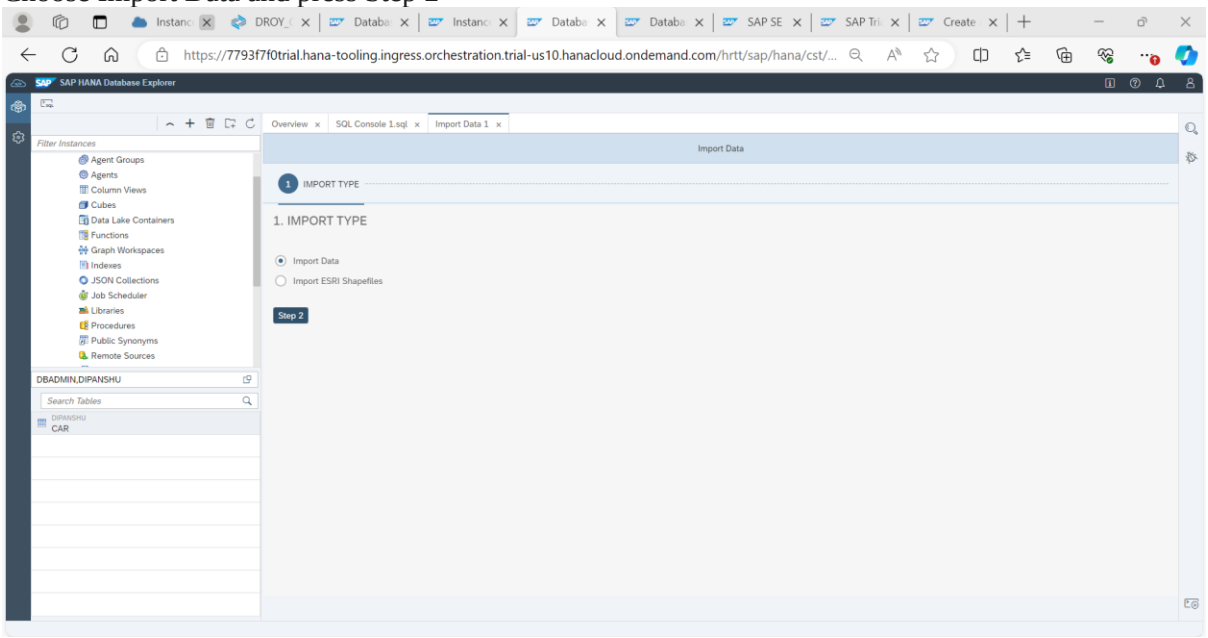




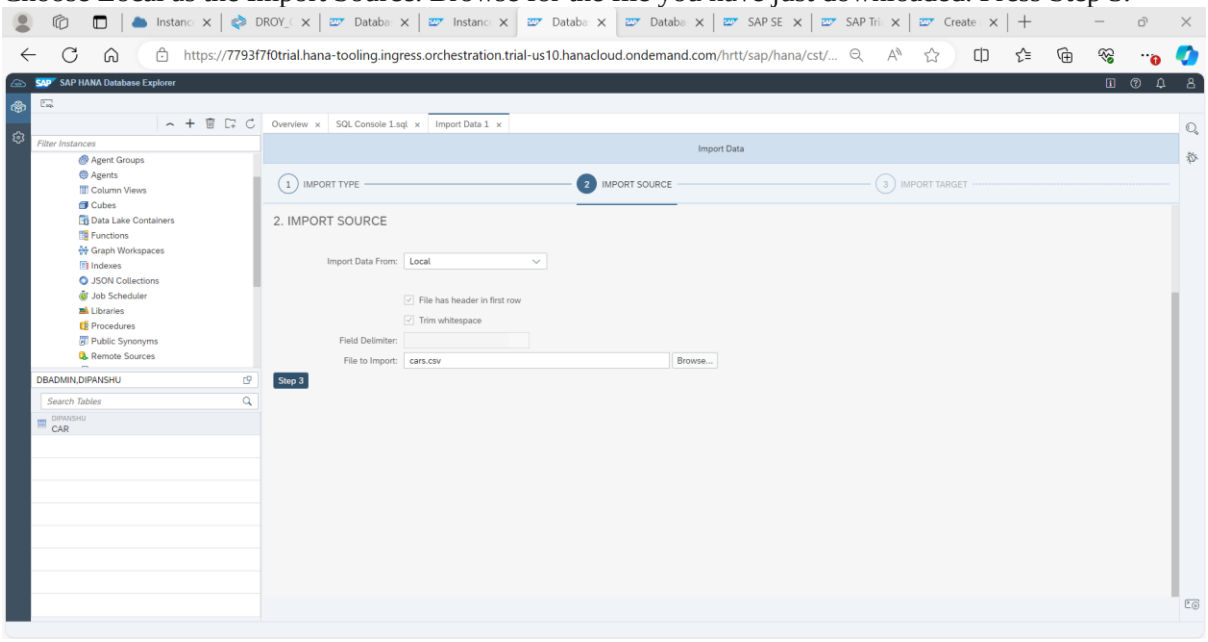
Now click on Tables. Right-click on the CAR table and select ‘Import Data’



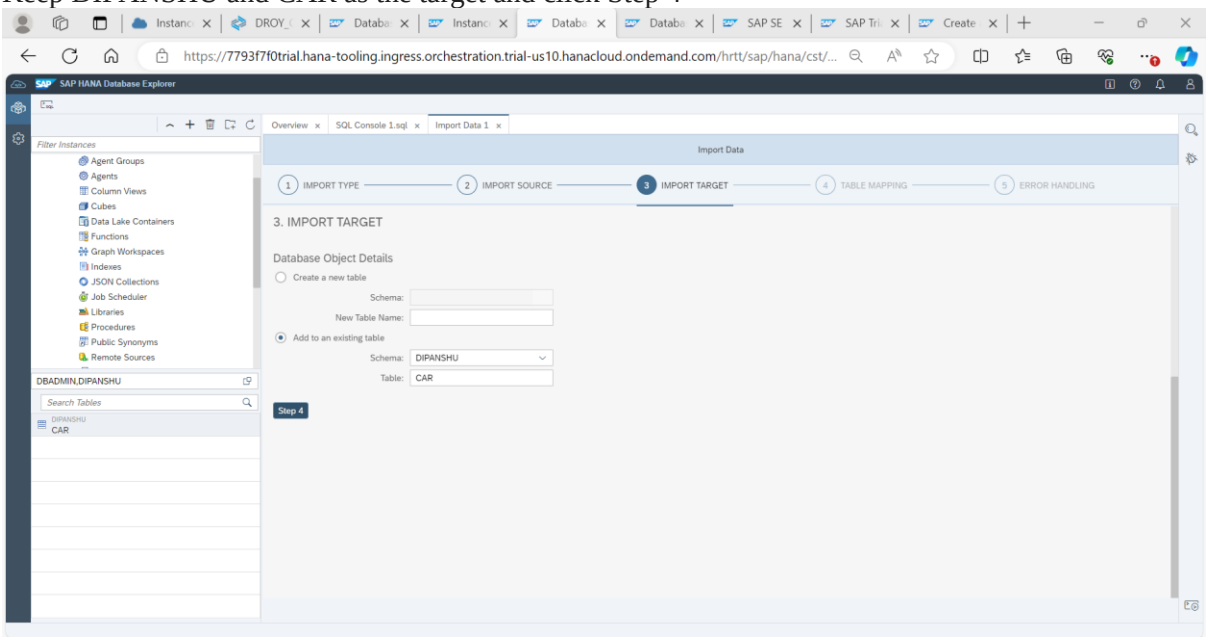
Choose Import Data and press Step 2



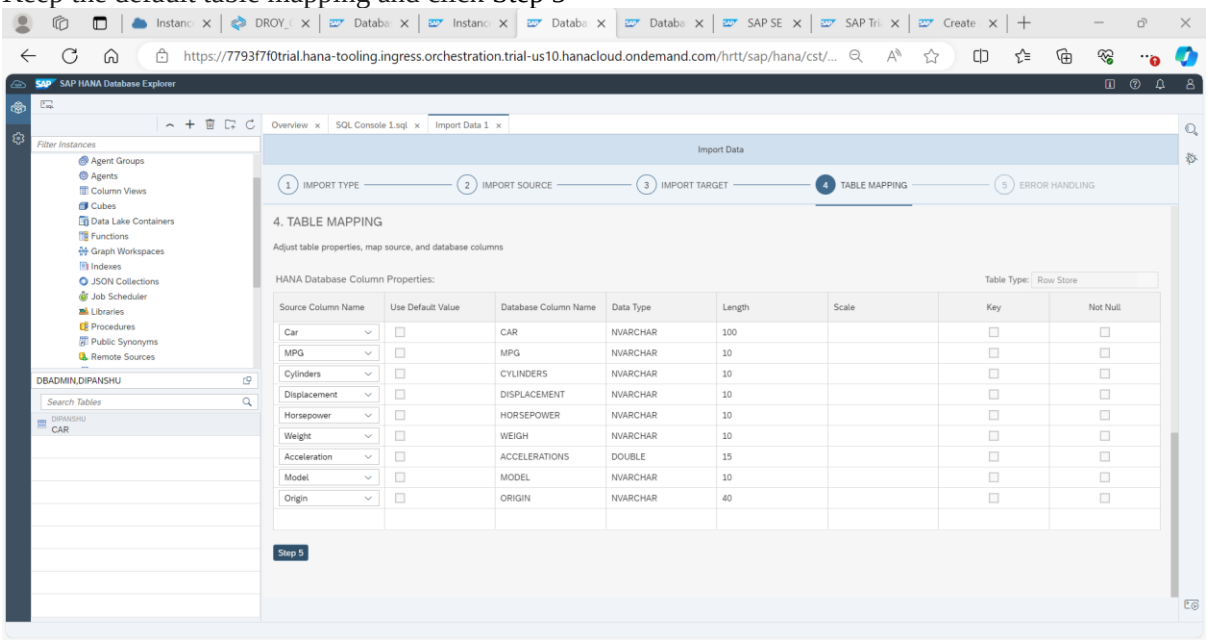
Choose Local as the Import Source. Browse for the file you have just downloaded. Press Step 3.



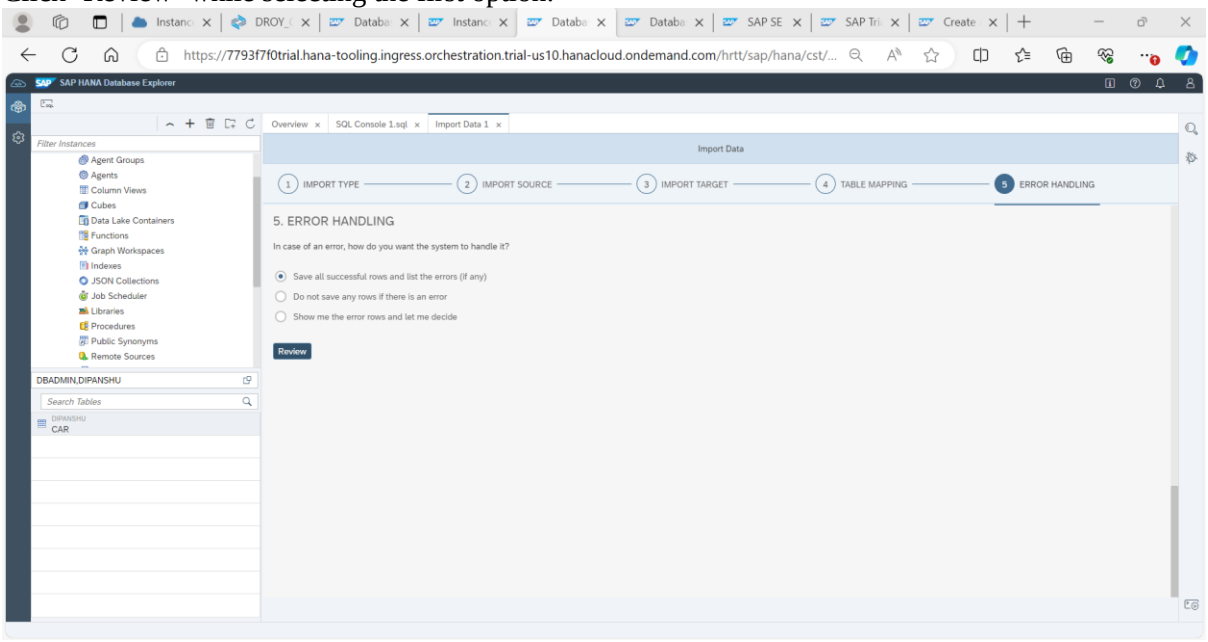
Keep DIPANSHU and CAR as the target and click Step 4



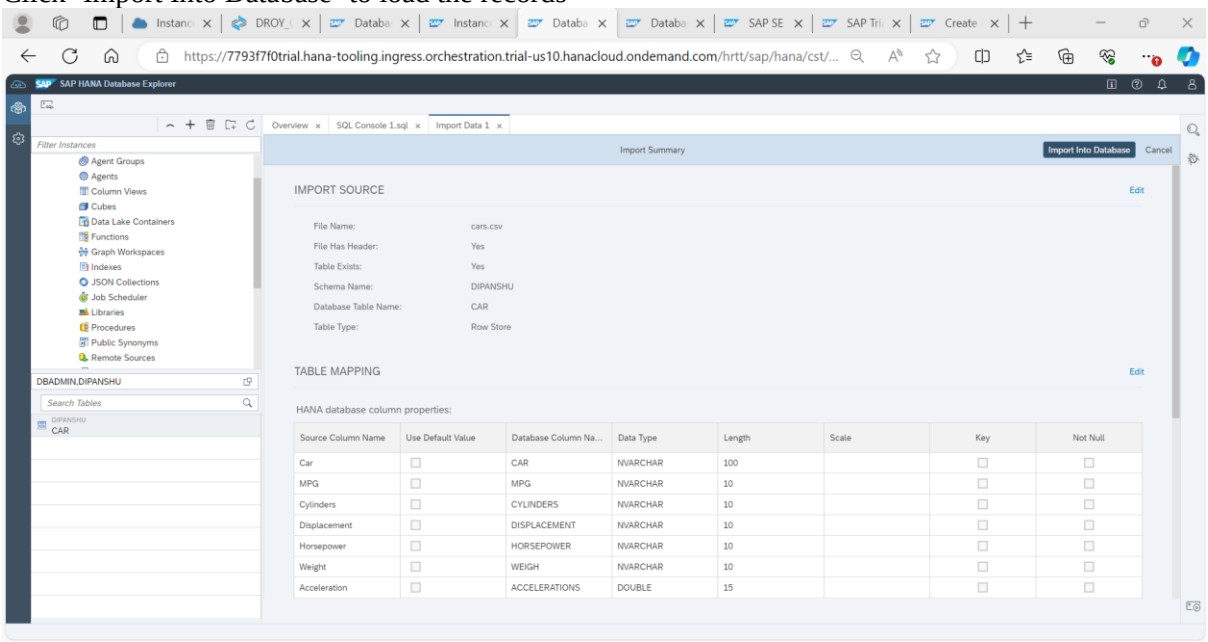
Keep the default table mapping and click Step 5



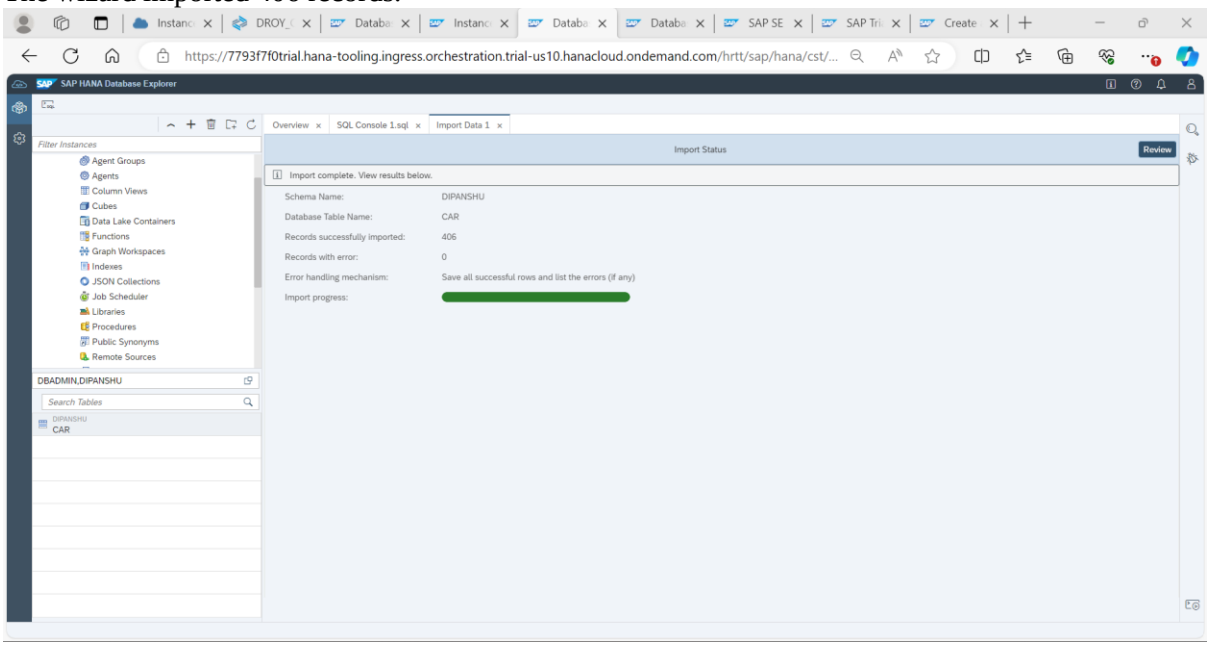
Click ‘Review’ while selecting the first option.



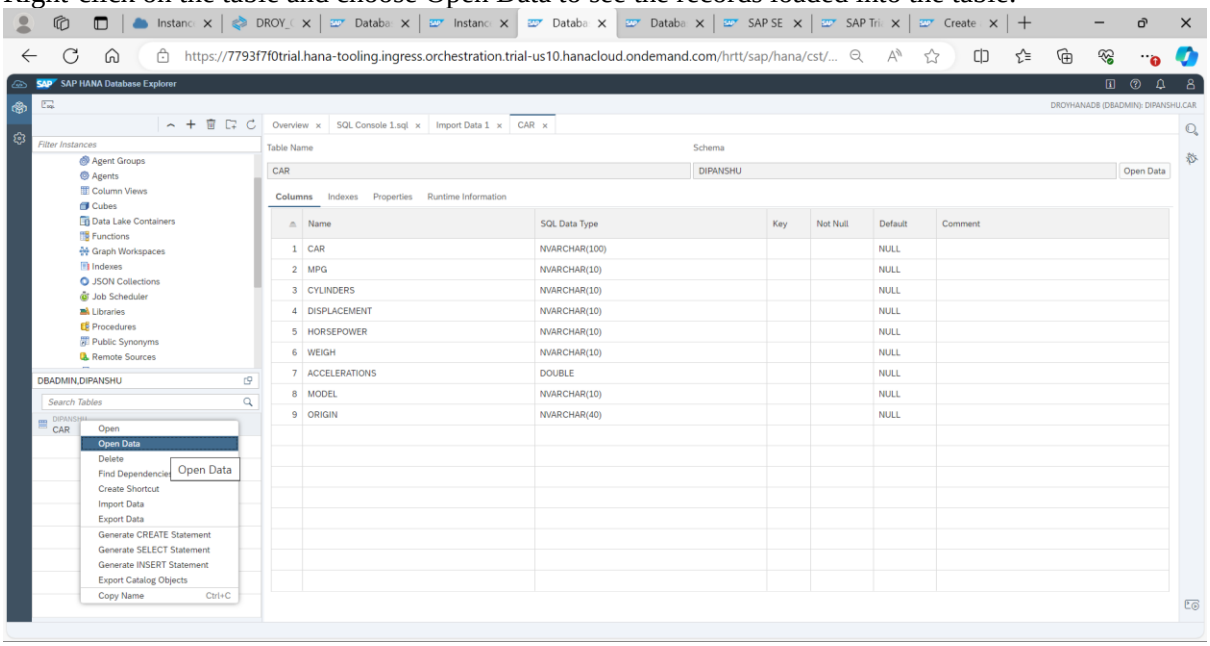
Click ‘Import Into Database’ to load the records

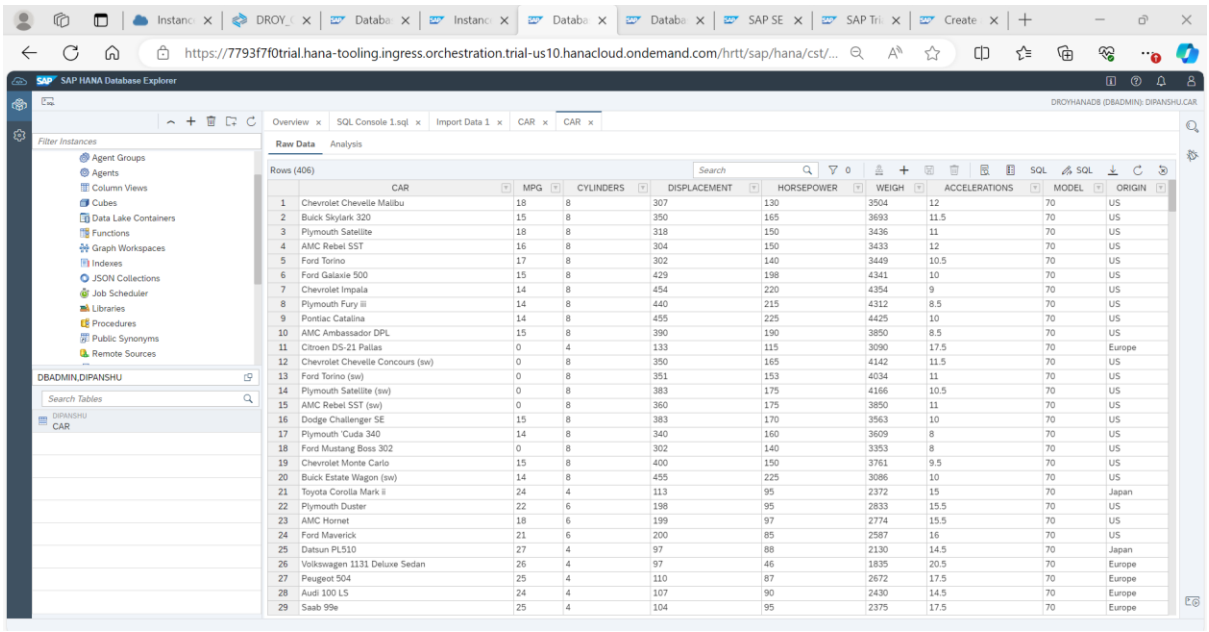


The wizard imported 406 records.

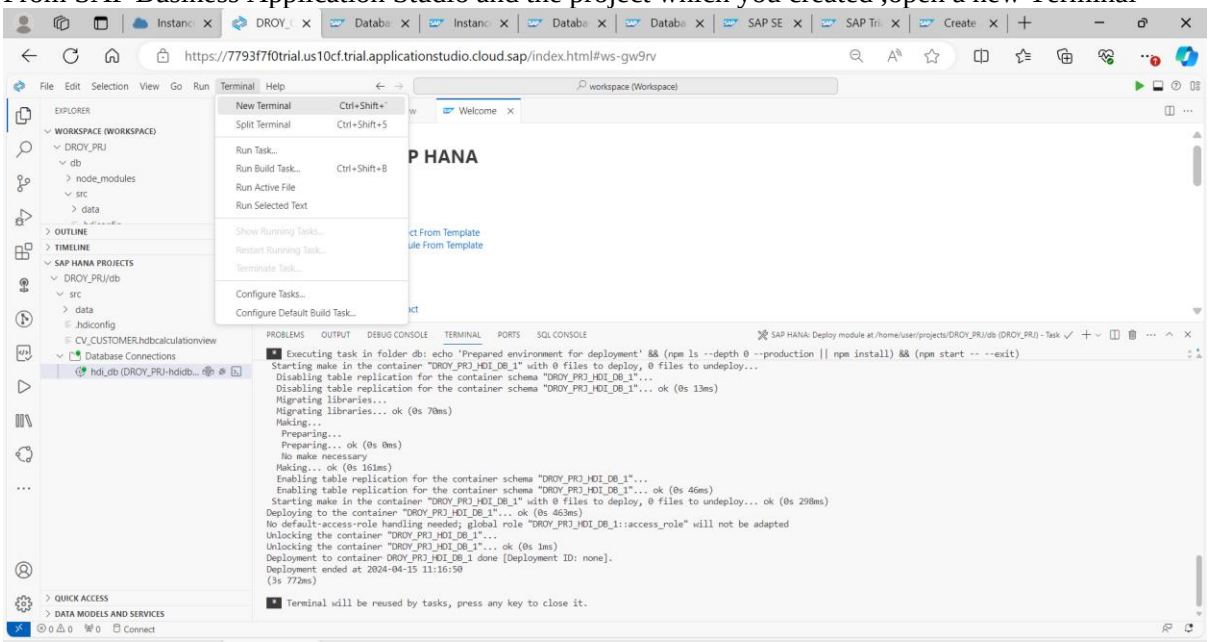


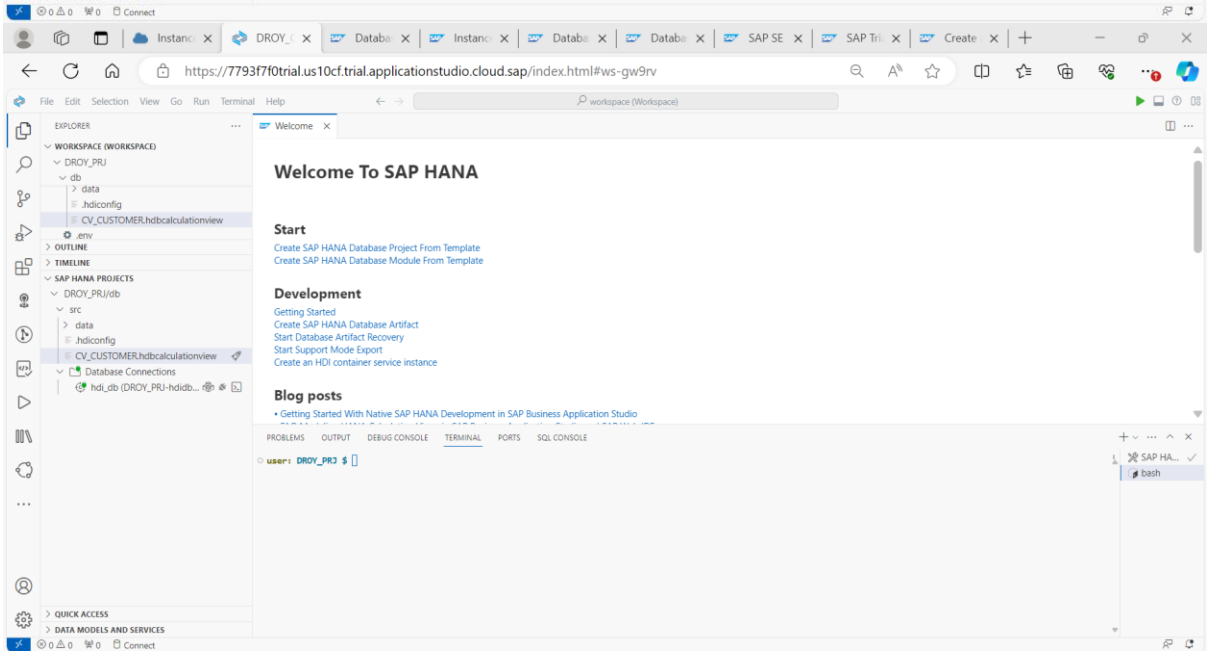
Right-click on the table and choose Open Data to see the records loaded into the table.



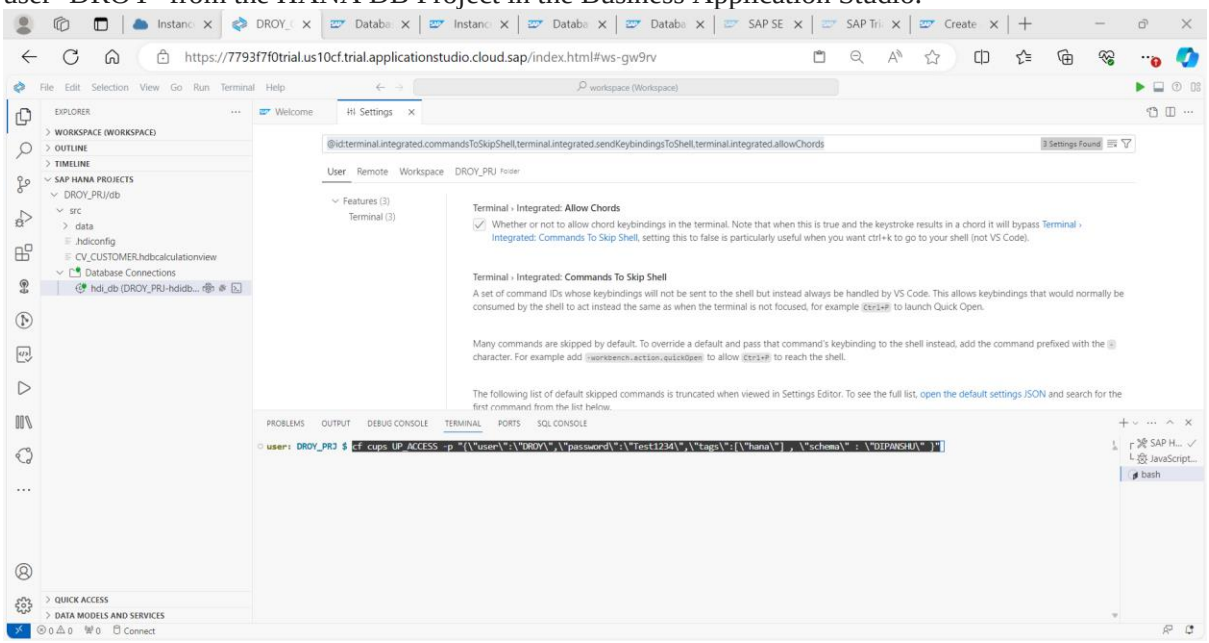


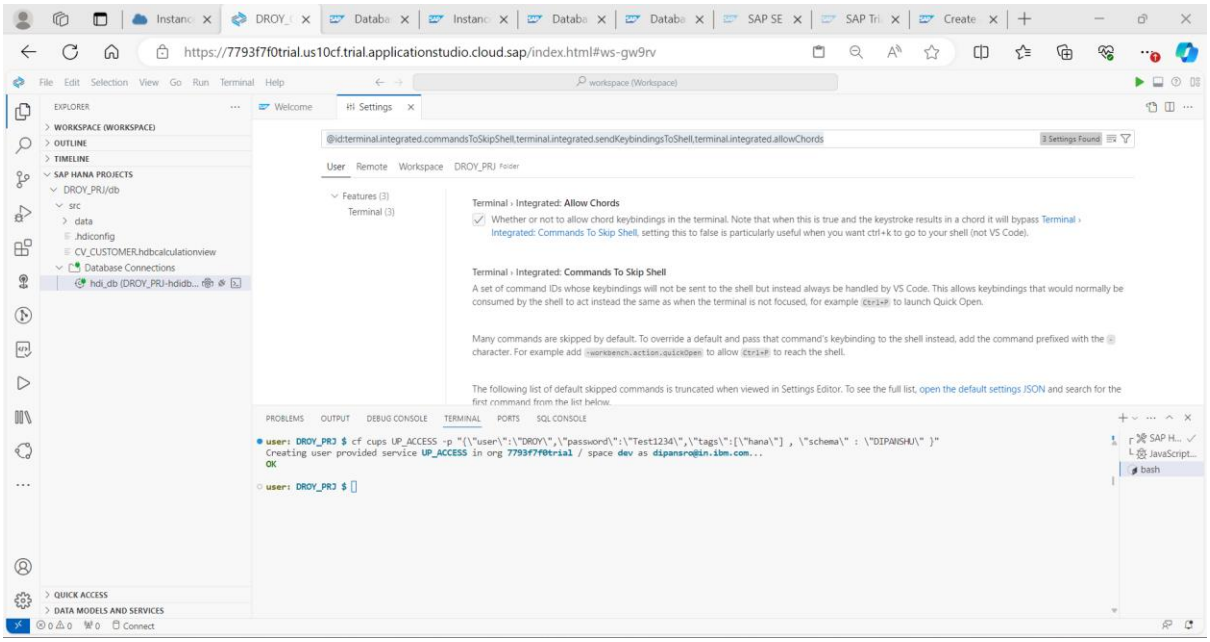
From SAP Business Application Studio and the project which you created ,open a new Terminal



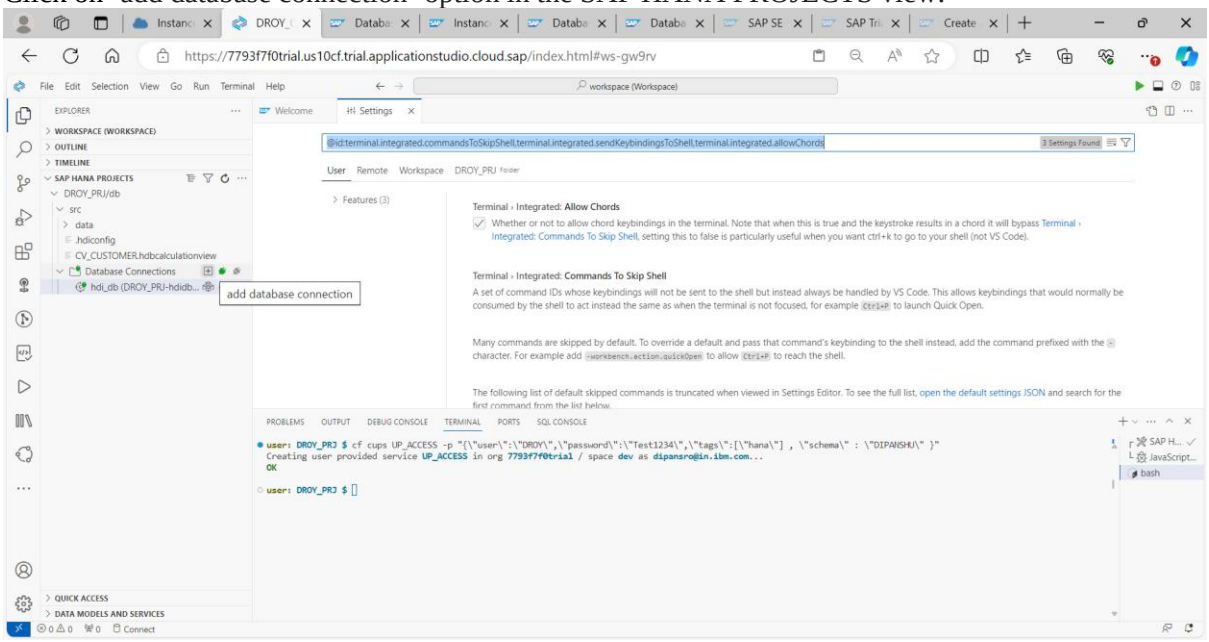


Run the following command from the Terminal. This will create a user-provided service to access the schema through the user ‘DROY’ from the HANA DB Project in the Business Application Studio.

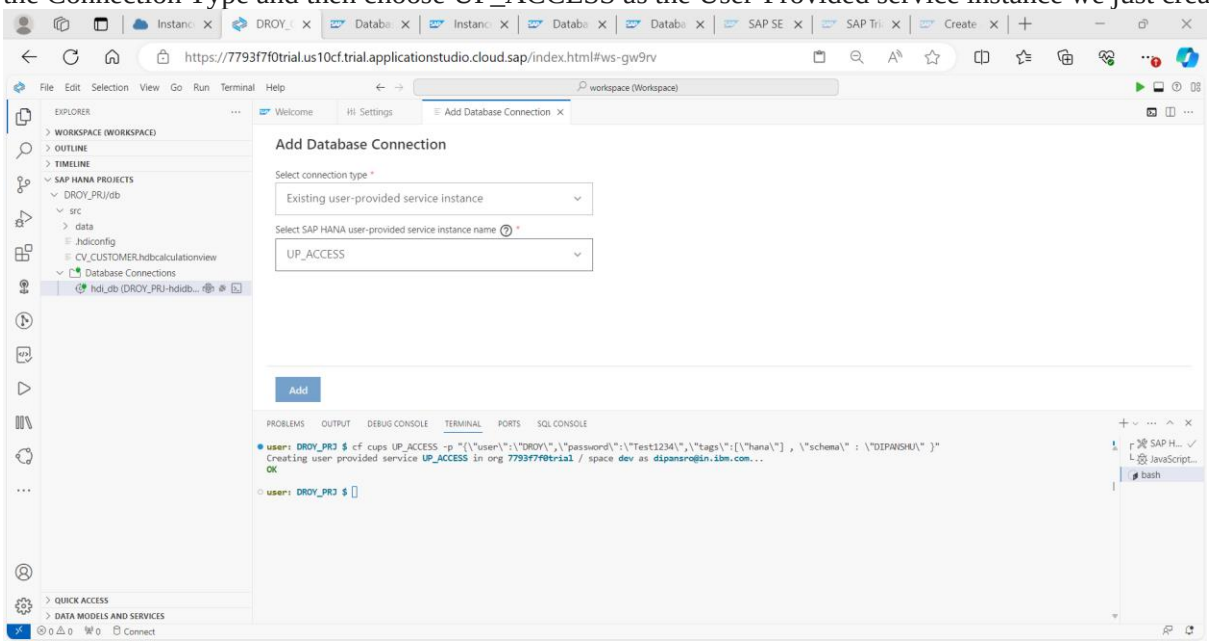




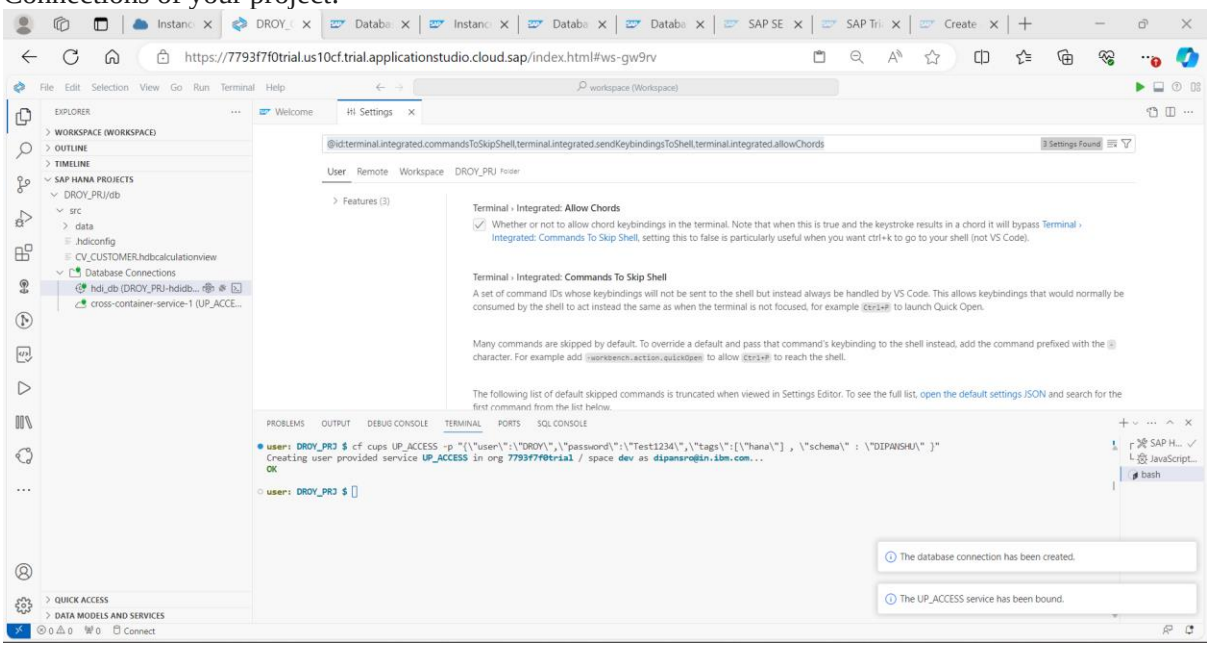
Click on ‘add database connection’ option in the SAP HANA PROJECTS view.



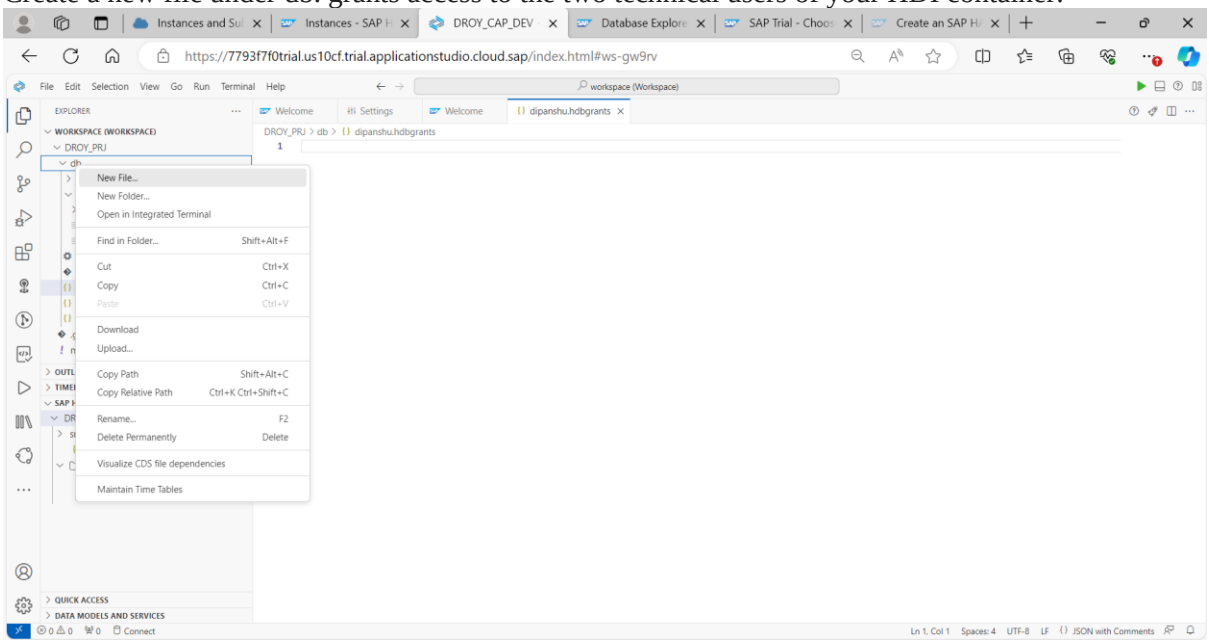
In the Add Database Connection wizard that opens, please select Existing User-Provided service instance as the Connection Type and then choose UP_ACCESS as the User-Provided service instance we just created. Press Add.

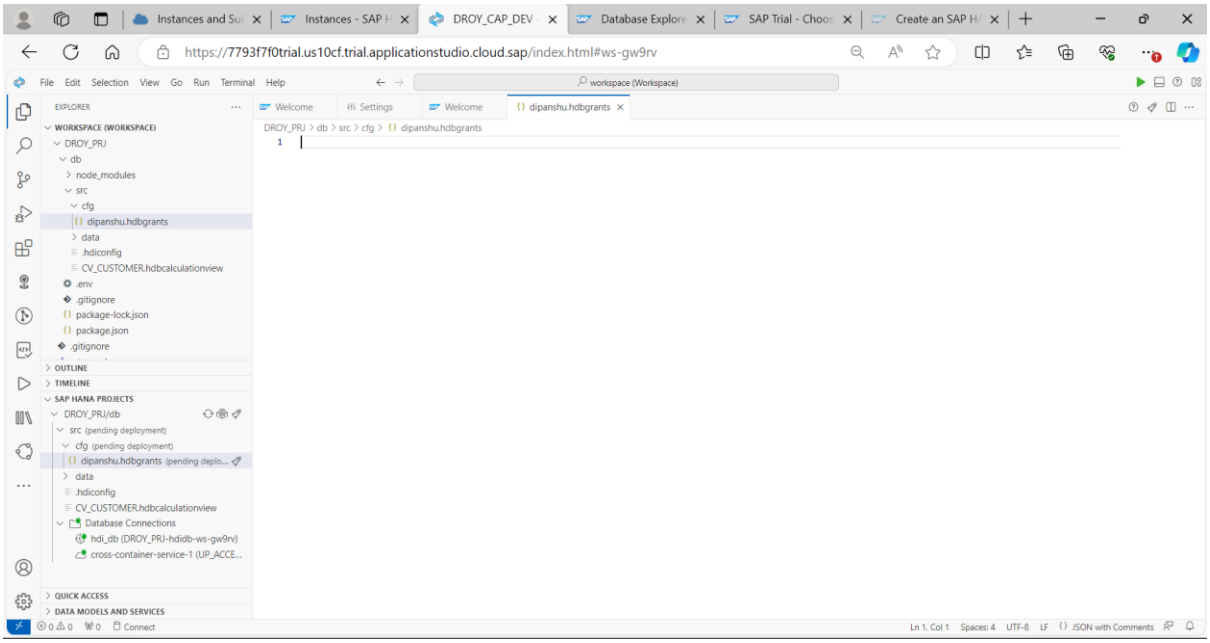


From the SAP HANA PROJECTS view, you should see that the User Provided Service is now part of the Database Connections of your project.

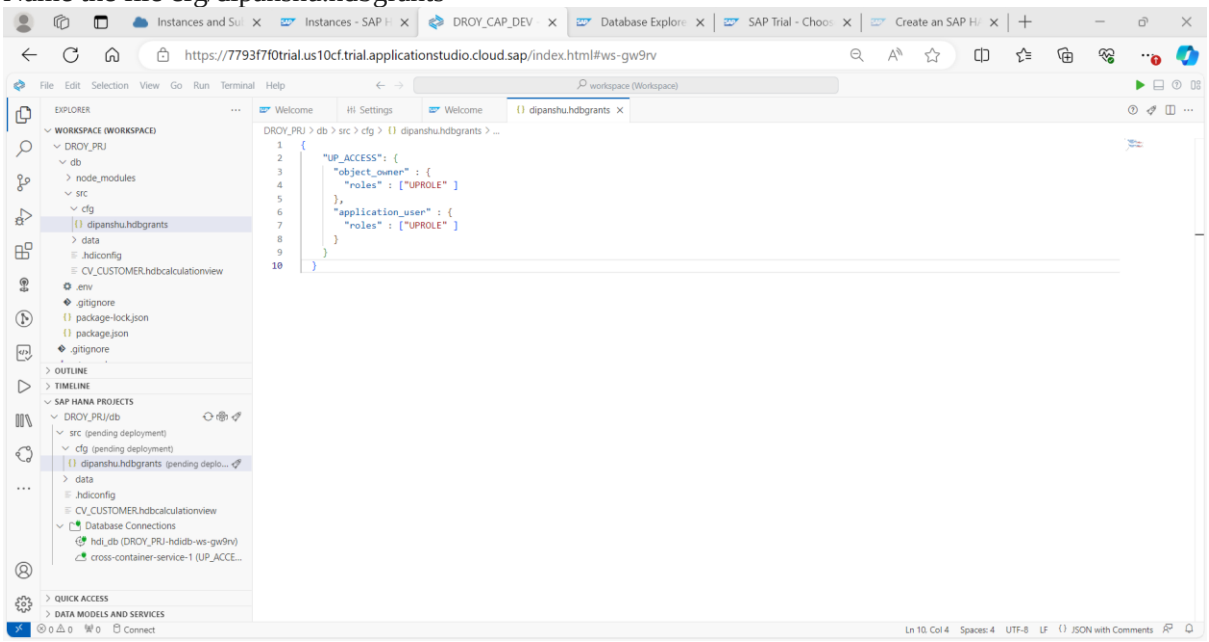


Create a new file under db. grants access to the two technical users of your HDI container.

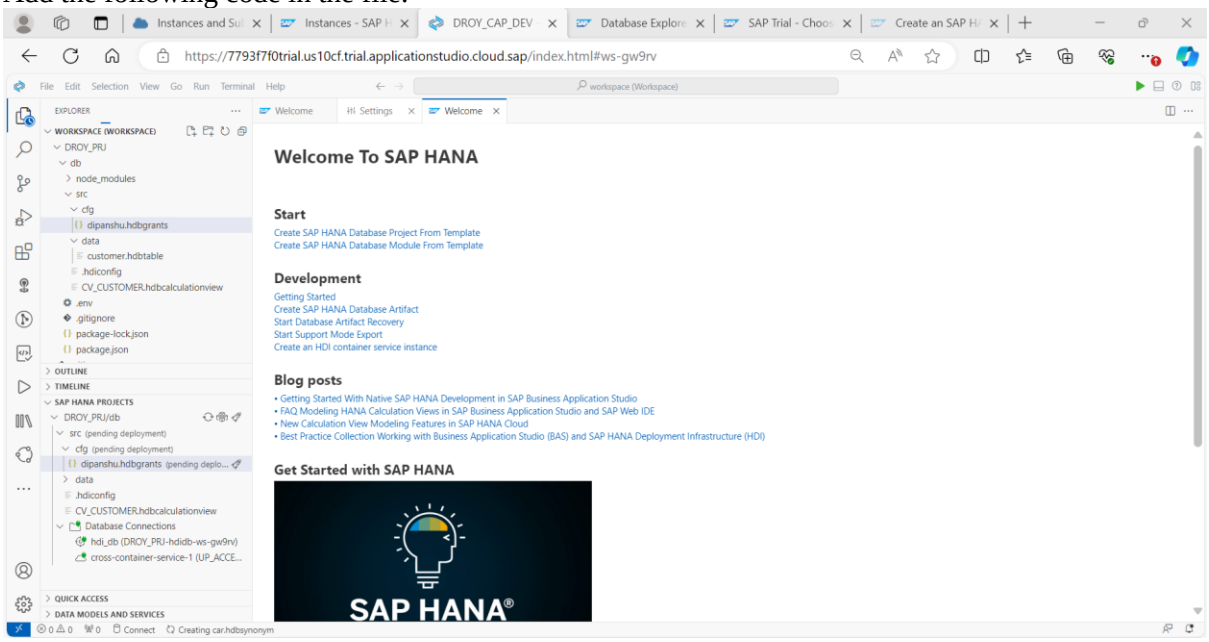




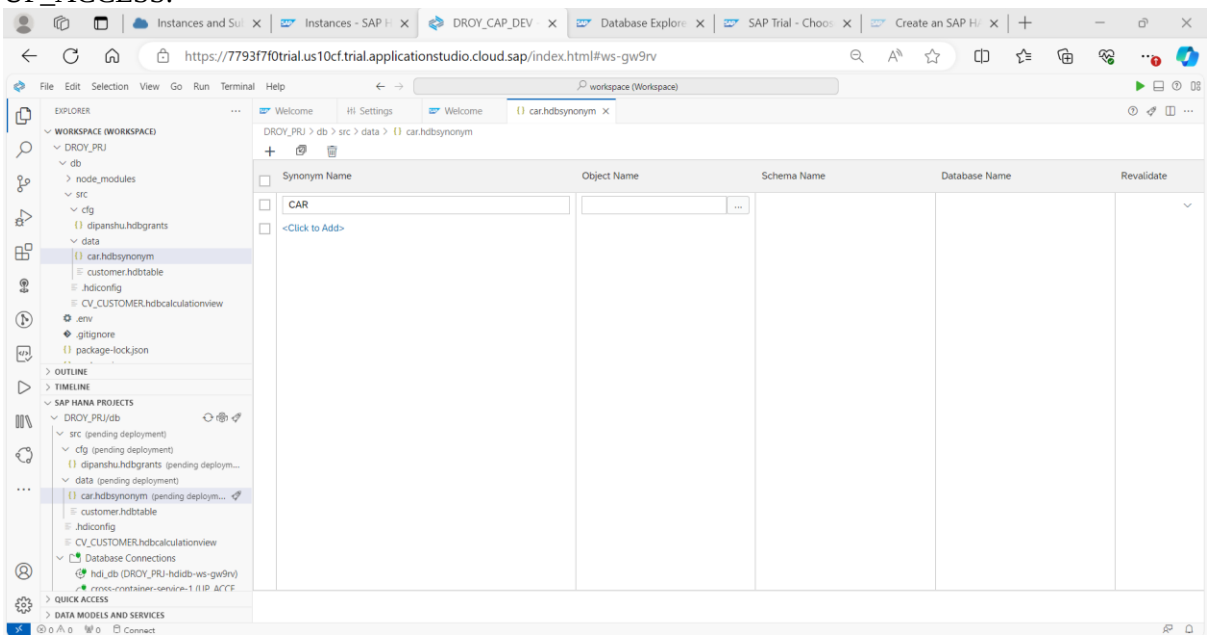
Name the file cfg/dipanshu.hdbgrants

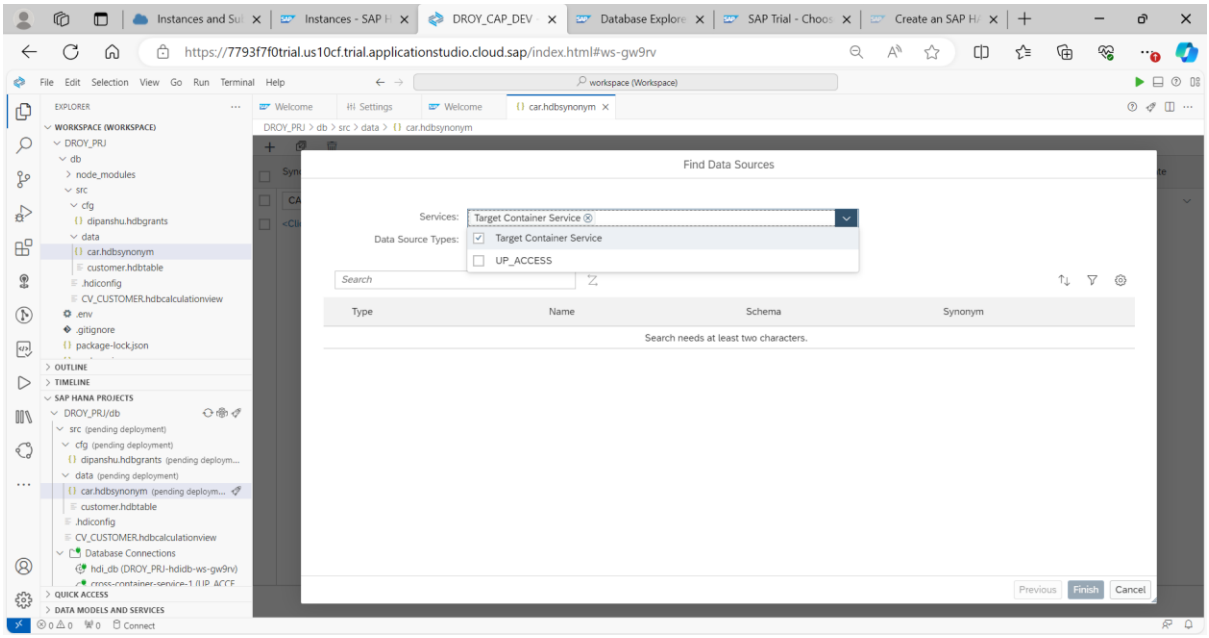


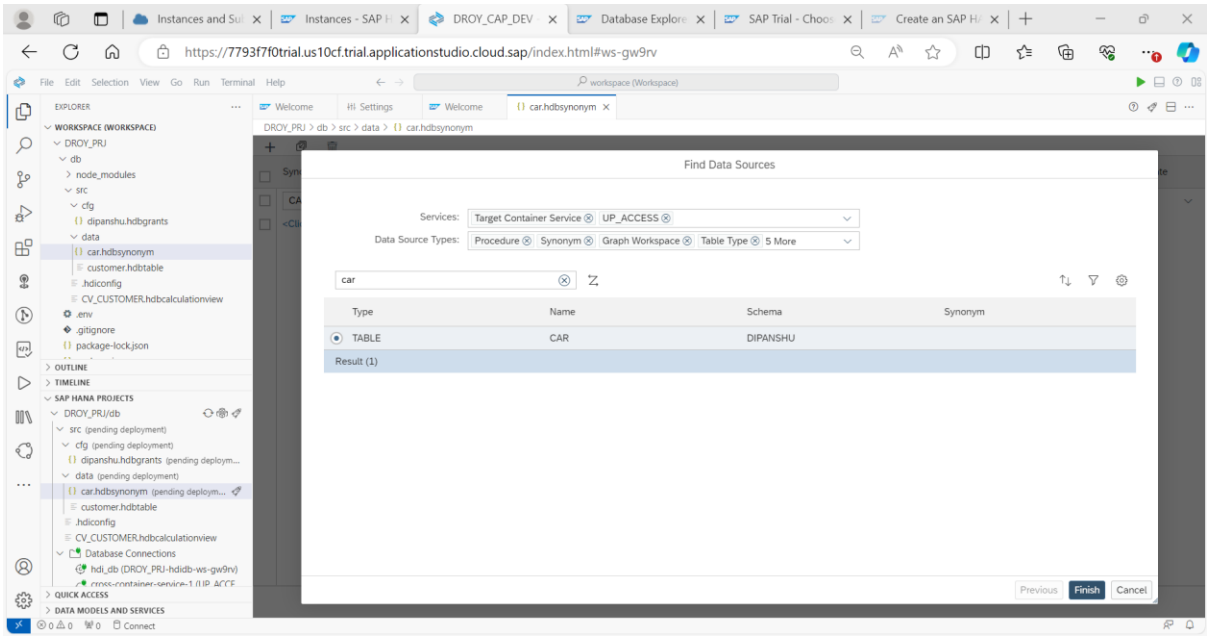
Add the following code in the file.



create a synonym to access the table in the 'dipanshu' schema. Create a new file called car.hdbsynonym in db\src\data. Add a new record with name CAR, object name CAR and schema DIPANSHU after selecting the user provided service UP_ACCESS.




Find Data Sources
Services:
Target Container Service
Data Source Types:
Target Container Service
UP_ACCESS
Search
Type
Name
Schema
Synonym
Search needs at least two characters.
Previous
Finish
Cancel


Find Data Sources
Services:
Target Container Service
UP_ACCESS
Data Source Types:
Procedure
Synonym
Graph Workspace
Table Type
5 More
car
Type
Name
Schema
Synonym
TABLE
CAR
DIPANSHU
Result (1)
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Finish
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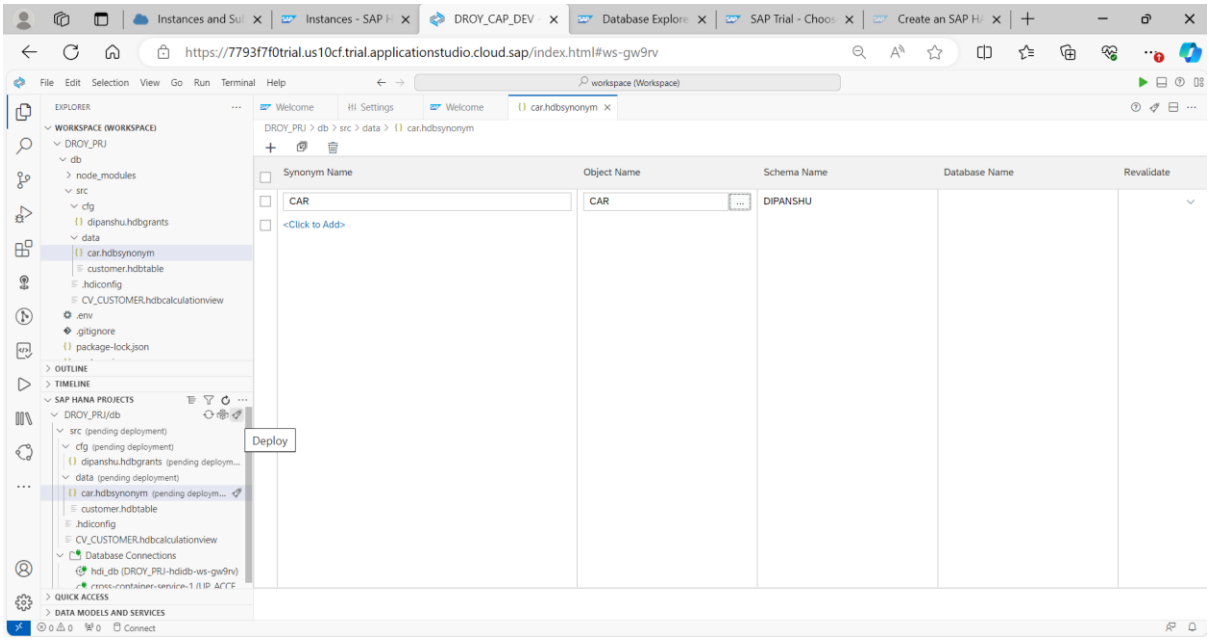
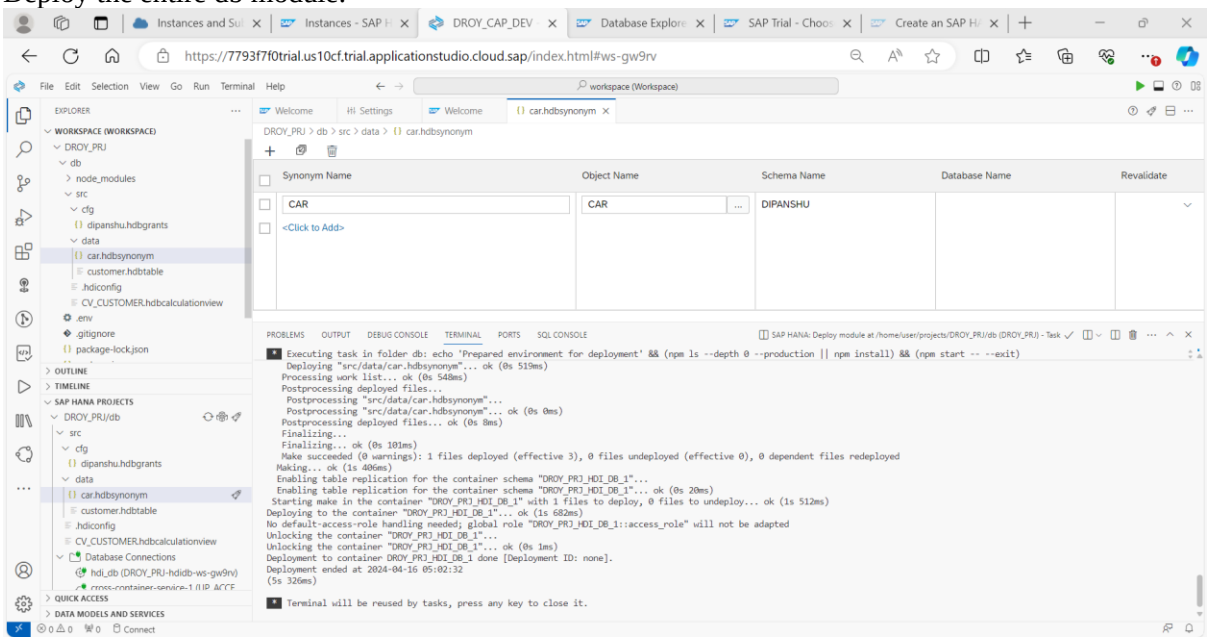
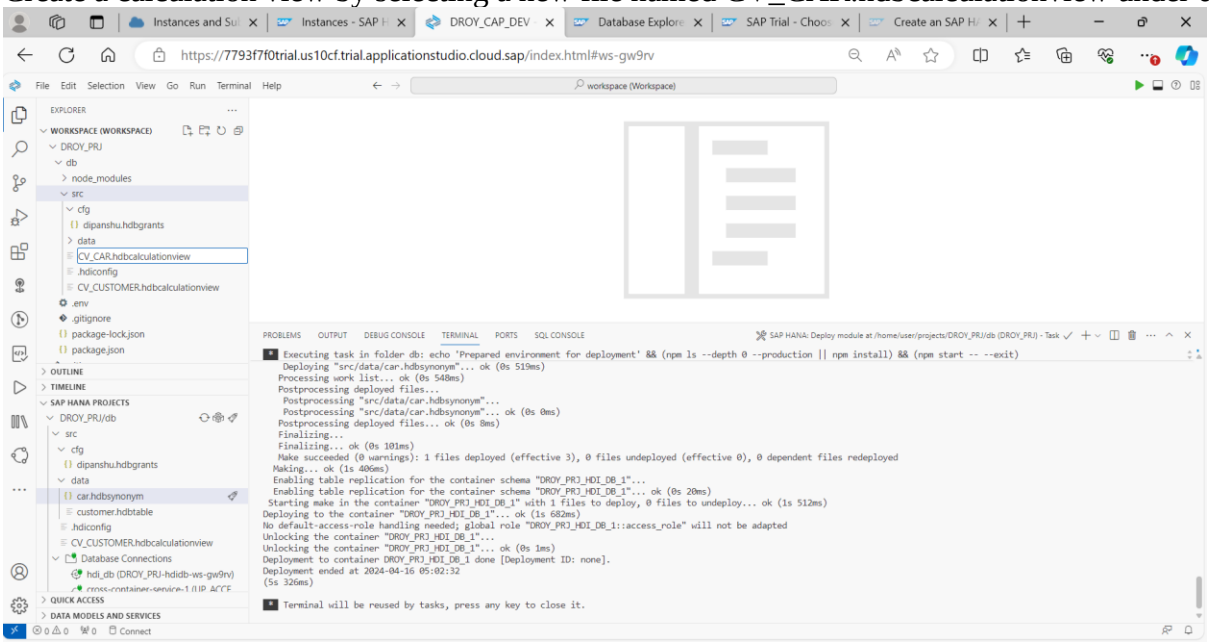


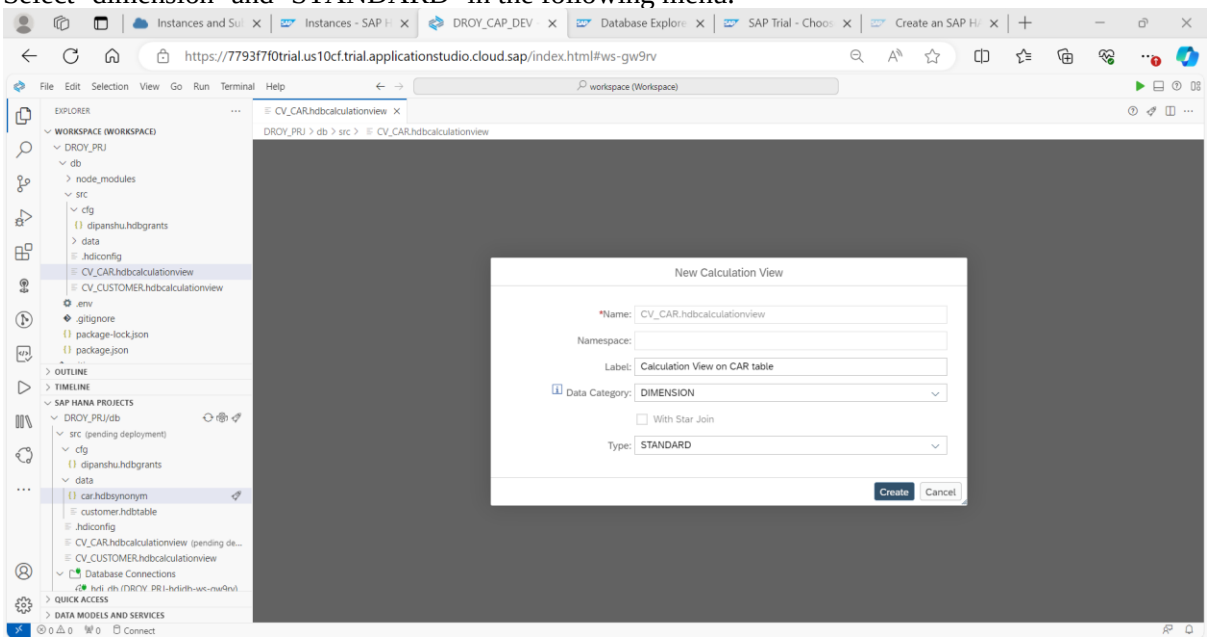
Deploy the entire db module.

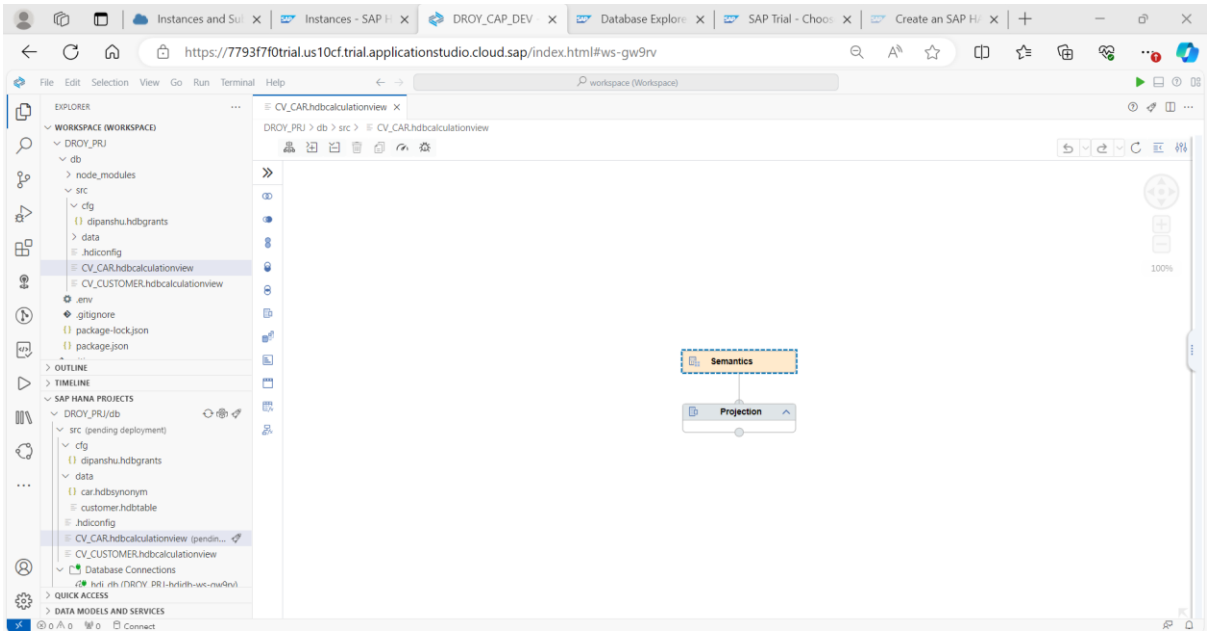


Create a calculation view by selecting a new file named CV_CAR.hdbcalculationview under db/src.

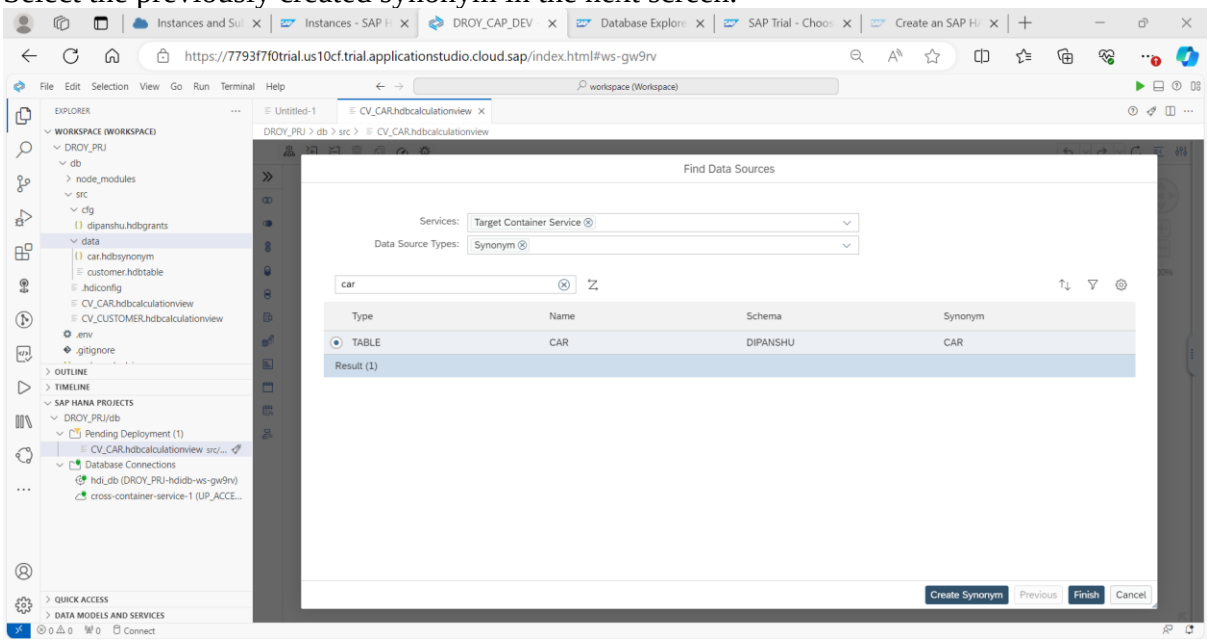


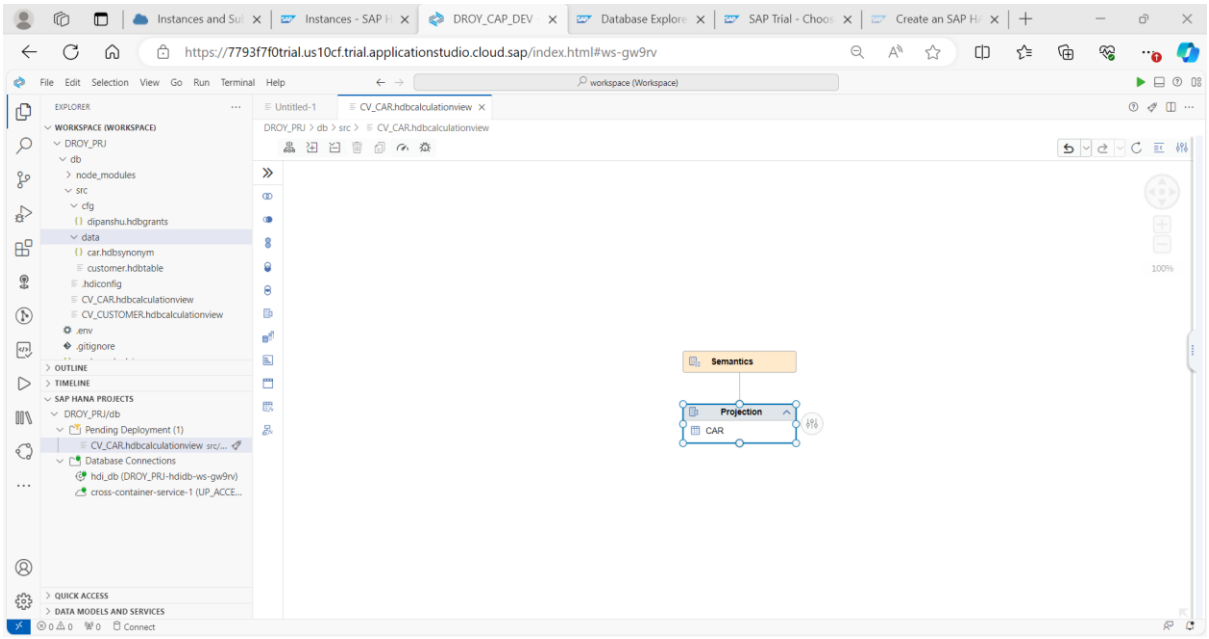
Select ‘dimension’ and ‘STANDARD’ in the following menu.



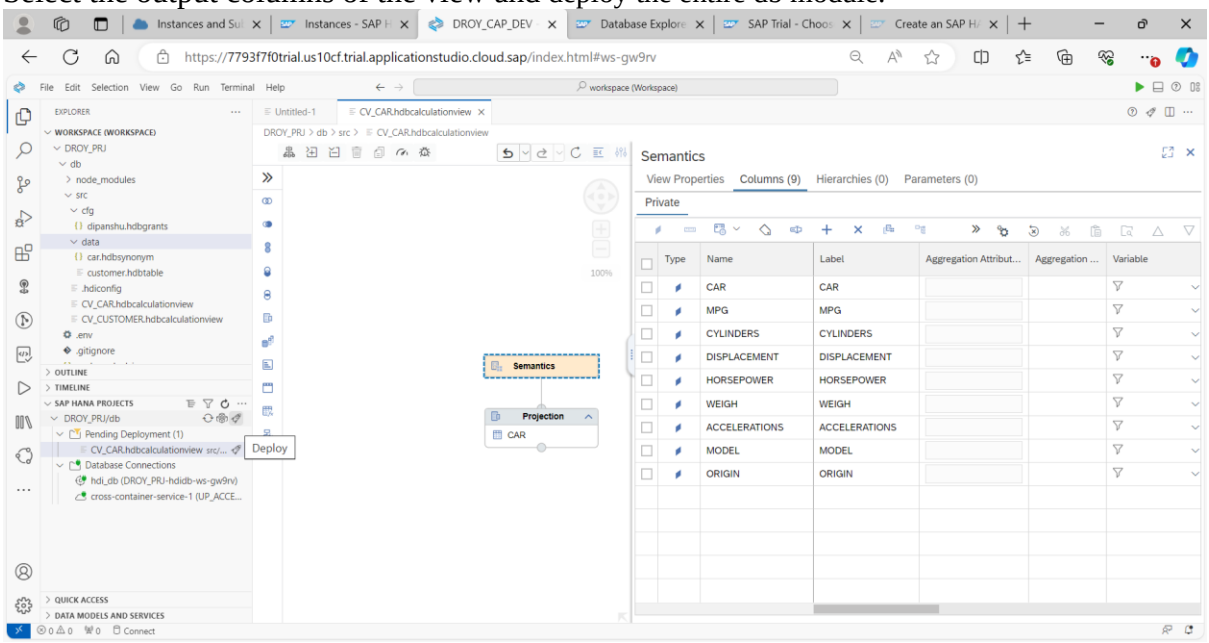


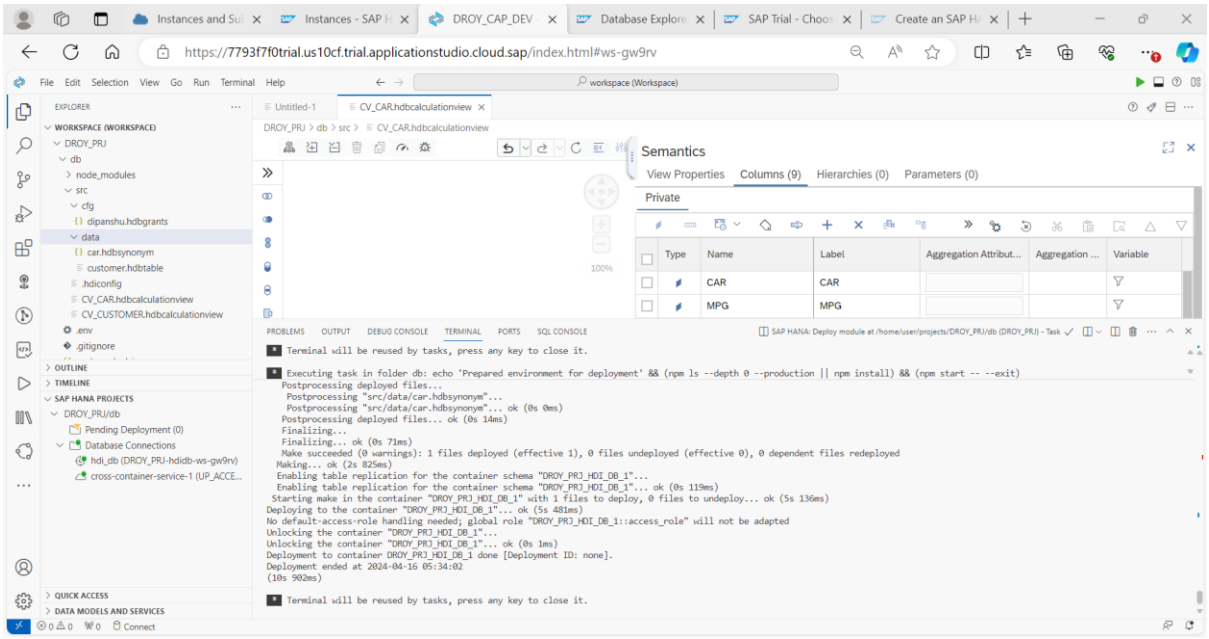
Select the previously created synonym in the next screen.



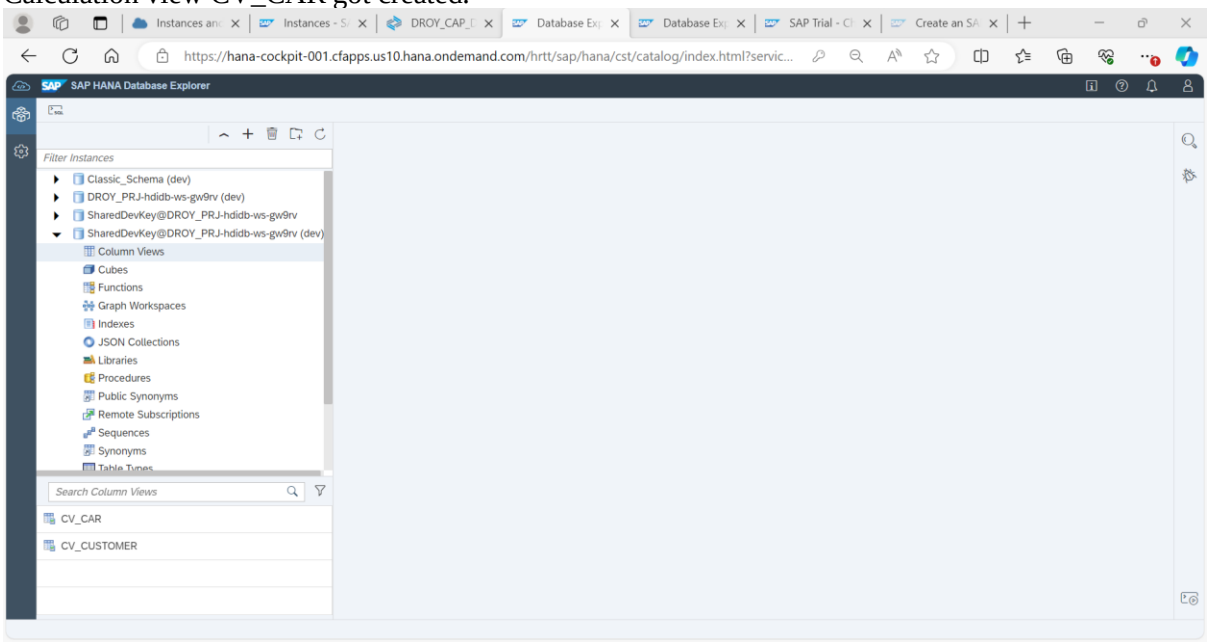


Select the output columns of the view and deploy the entire db module.

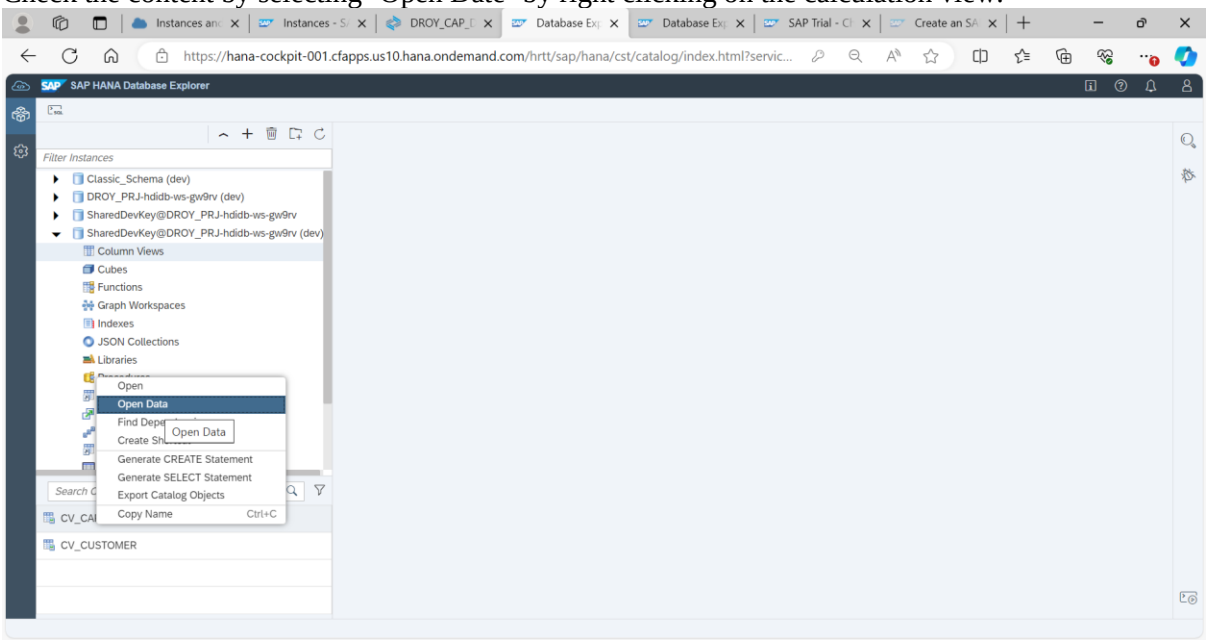


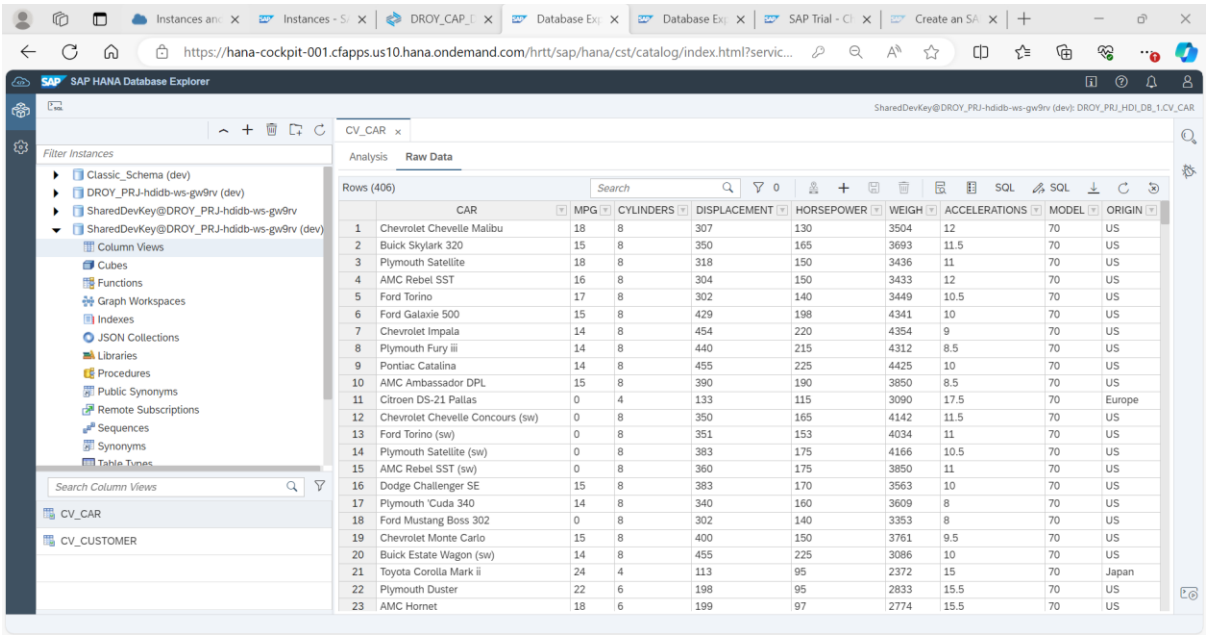


Calculation view CV_CAR got created.



Check the content by selecting ’Open Date’ by right clicking on the calculation view.





	CAR	MPG	CYLINDERS	DISPLACEMENT	HORSEPOWER	WEIGH	ACCELERATIONS	MODEL	ORIGIN
1	Chevrolet Chevelle Malibu	18	8	307	130	3504	12	70	US
2	Buick Skylark 320	15	8	350	165	3693	11.5	70	US
3	Plymouth Satellite	18	8	318	150	3436	11	70	US
4	AMC Rebel SST	16	8	304	150	3433	12	70	US
5	Ford Torino	17	8	302	140	3449	10.5	70	US
6	Ford Galaxie 500	15	8	429	198	4341	10	70	US
7	Chevrolet Impala	14	8	454	220	4354	9	70	US
8	Plymouth Fury iii	14	8	440	215	4312	8.5	70	US
9	Pontiac Catalina	14	8	455	225	4425	10	70	US
10	AMC Ambassador DPL	15	8	390	190	3850	8.5	70	US
11	Citroen DS-21 Pallas	0	4	133	115	3090	17.5	70	Europe
12	Chevrolet Chevelle Concours (sw)	0	8	350	165	4142	11.5	70	US
13	Ford Torino (sw)	0	8	351	153	4034	11	70	US
14	Plymouth Satellite (sw)	0	8	383	175	4166	10.5	70	US
15	AMC Rebel SST (sw)	0	8	360	175	3850	11	70	US
16	Dodge Challenger SE	15	8	383	170	3563	10	70	US
17	Plymouth 'Cuda 340	14	8	340	160	3609	8	70	US
18	Ford Mustang Boss 302	0	8	302	140	3353	8	70	US
19	Chevrolet Monte Carlo	15	8	400	150	3761	9.5	70	US
20	Buick Estate Wagon (sw)	14	8	455	225	3086	10	70	US
21	Toyota Corolla Mark ii	24	4	113	95	2372	15	70	Japan
22	Plymouth Duster	22	6	198	95	2833	15.5	70	US
23	AMC Hornet	18	6	199	97	2774	15.5	70	US

CONCLUSION:

Above guide would help developer to accessing external schema from a HDI container using user provided service of cloud foundry in Business Application Studio in SAP HANA cloud. Developers, who are having basic HANA cloud database development knowledge can easily perform the task.

REFERENCE:

1. Accessing Legacy Schema in HANA 2.0 HDI Container of XS Advanced Application (ibm.com)
2. Introduction to the SAP HANA Service | SAP Help Portal