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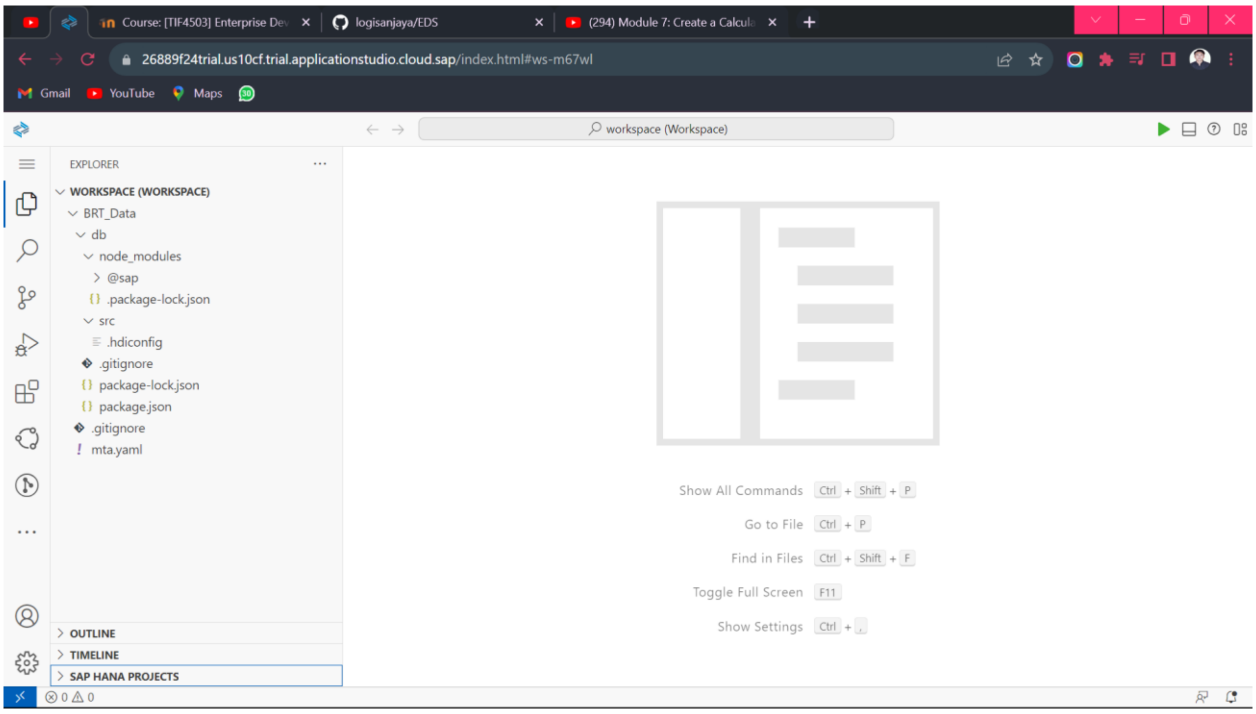
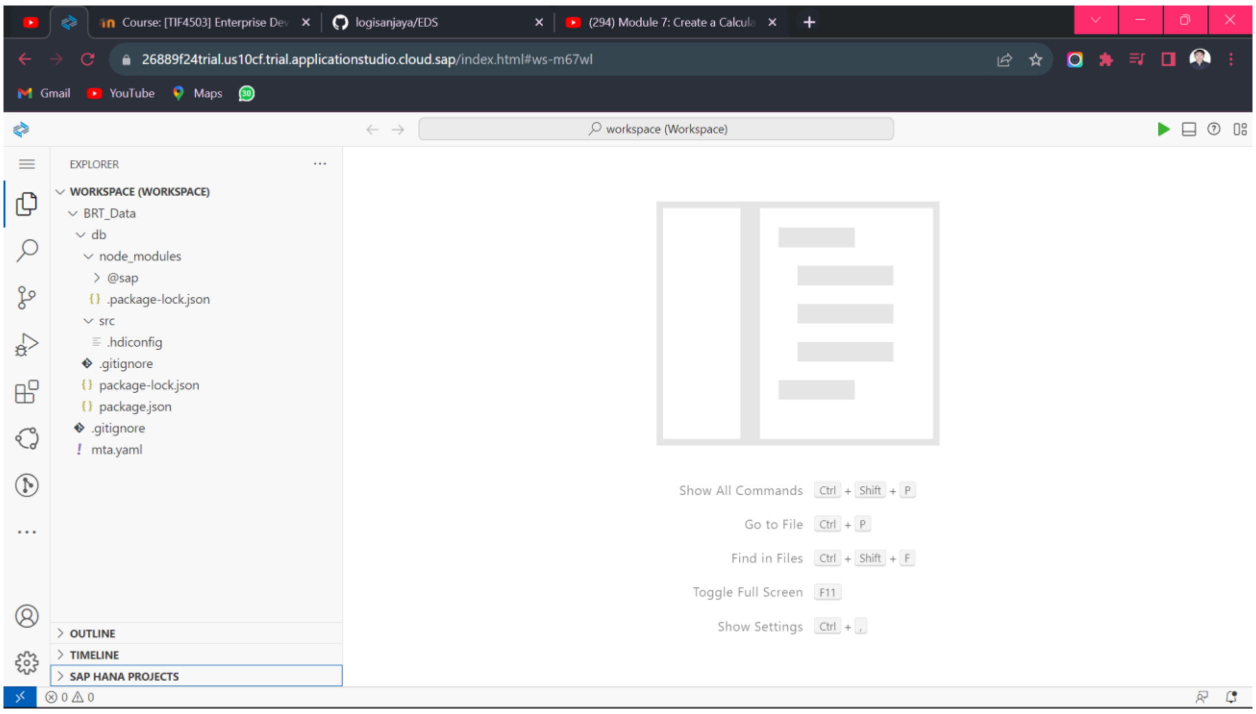
Nim : 201402007
Kelas : Kom A

UTS EDS

1. Create calculation view, dengan merujuk petunjuk di https://youtu.be/dPQWRSwRhiI

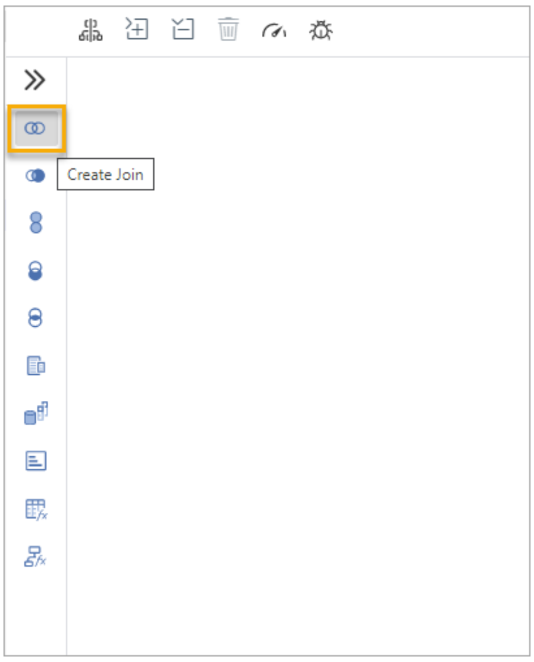


2. Share subset of data securely, dengan merujuk petunjuk di https://youtu.be/nHopbjCj0Rg

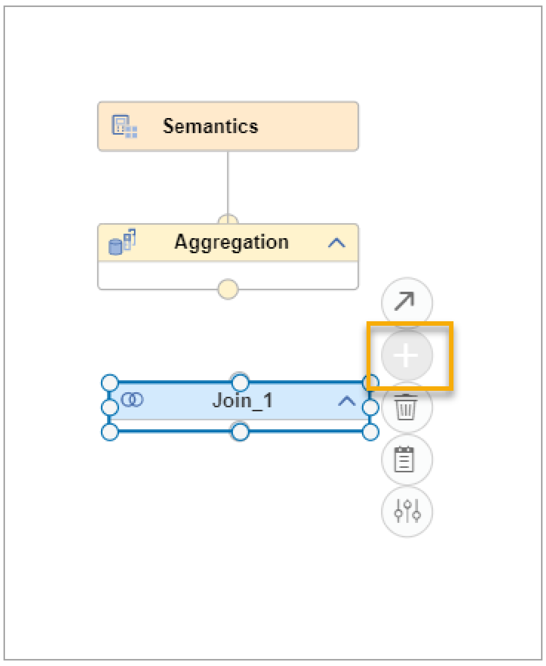


Create a Join Node

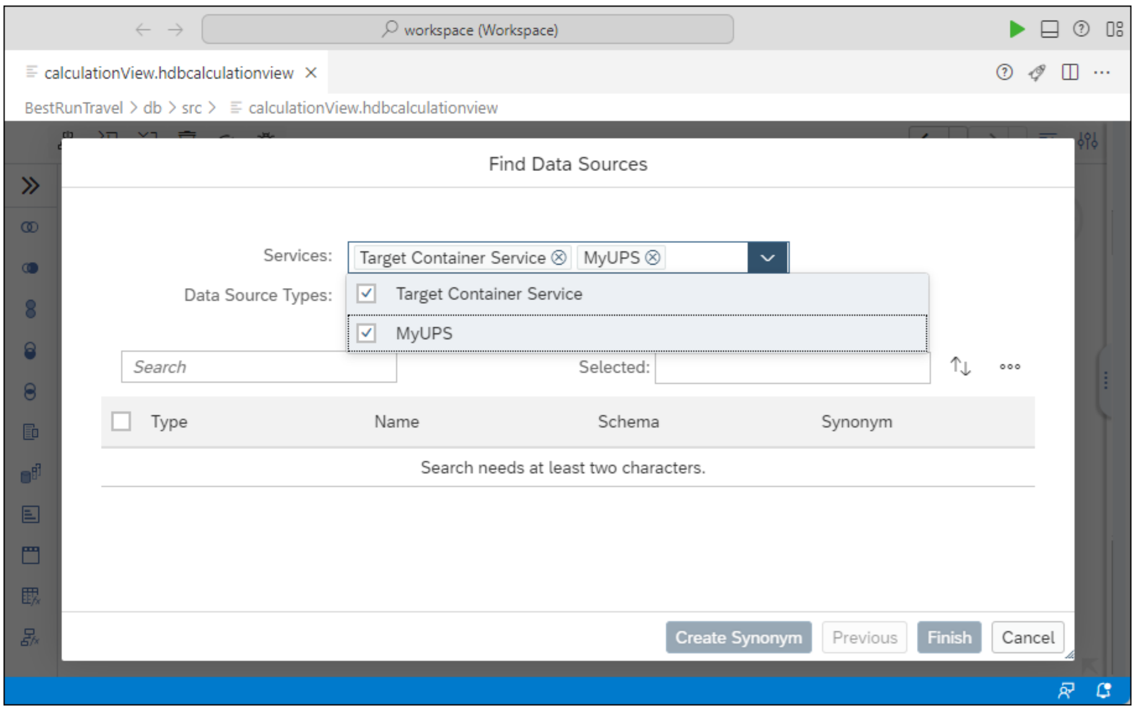
The calculation view will open automatically upon creation. In this example, start with a join node to join two tables. Click on the join icon on the sidebar of the editor and then click anywhere on the canvas.



The join node appears. Next to the node, click on the plus icon to add the tables.



On the pop-up, start by selecting the user-provided service on the Services drop-down list.


workspace (Workspace)
calculationView.hdbcalculationview
BestRunTravel > db > src > calculationView.hdbcalculationview
Find Data Sources
Search
Selected:
Create Synonym
Previous
Finish
Cancel

Services: Target Container Service ⊗ MyUPS ⊗

Data Source Types:

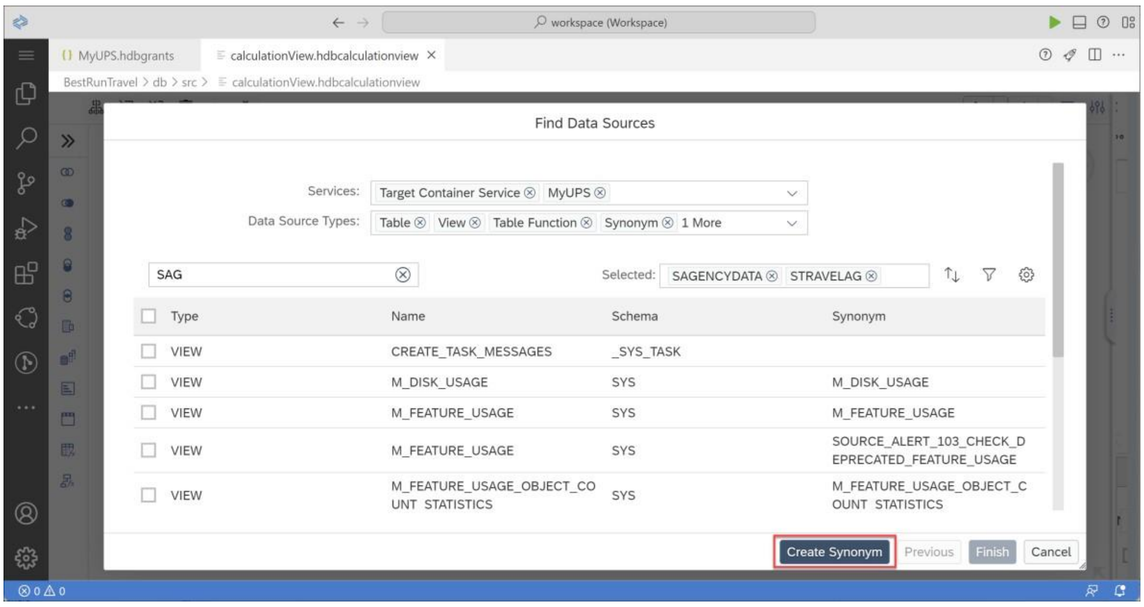
☑ Target Container Service

☑ MyUPS

□ Type	Name	Schema	Synonym

Search needs at least two characters.

Search for the SAGENCYDATA table, which we created in a previous tutorial. We can find the top 5 partners for Best Run Travel by joining the SAGENCY table with the STRAVELAG table. Add the STRAVELAG table to the join node. Once both objects are selected, click on Create Synonym.


workspace (Workspace)
MyUPS.hdbgrants
calculationView.hdbcalculationview
BestRunTravel > db > src > calculationView.hdbcalculationview

Find Data Sources

Services: Target Container Service ⊗ MyUPS ⊗

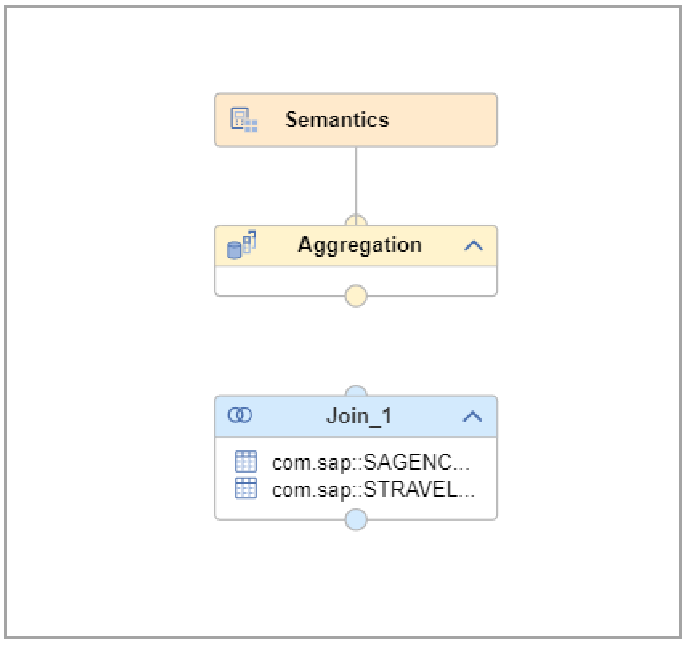
Data Source Types: Table ⊗ View ⊗ Table Function ⊗ Synonym ⊗ 1 More

SAG

Selected: SAGENCYDATA ⊗ STRAVELAG ⊗

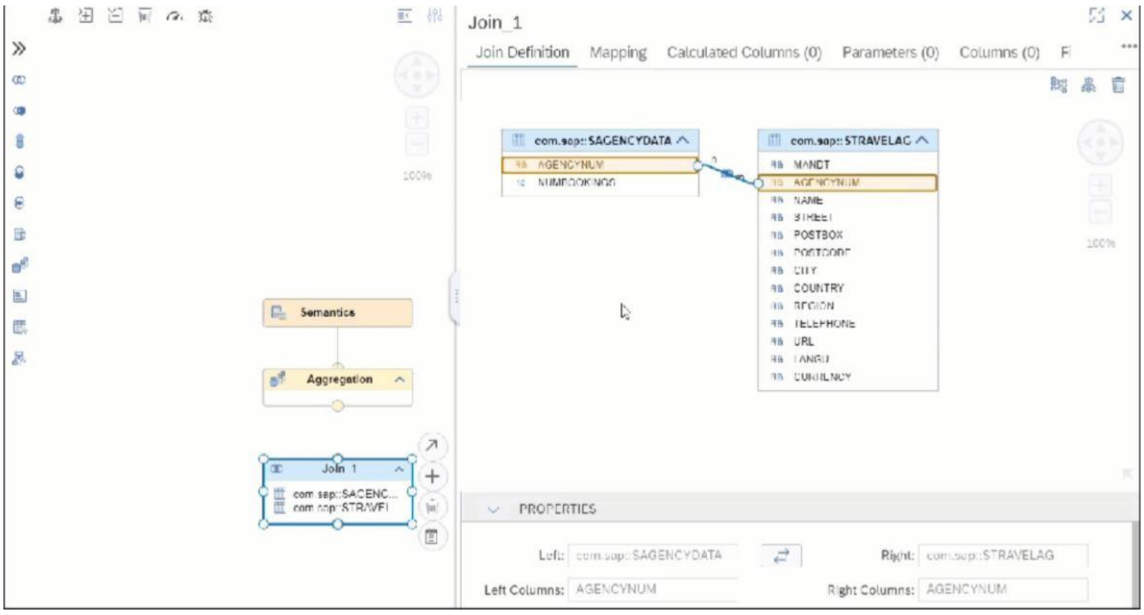
□	Type	Name	Schema	Synonym
□	VIEW	CREATE_TASK_MESSAGES	_SYS_TASK	
□	VIEW	M_DISK_USAGE	SYS	M_DISK_USAGE
□	VIEW	M_FEATURE_USAGE	SYS	M_FEATURE_USAGE
□	VIEW	M_FEATURE_USAGE	SYS	SOURCE_ALERT_103_CHECK_DEPRECATED_FEATURE_USAGE
□	VIEW	M_FEATURE_USAGE_OBJECT_COUNT STATISTICS	SYS	M_FEATURE_USAGE_OBJECT_COUNT STATISTICS

Click on Finish without selecting any other options. In your file explorer, a new file will appear ending with .hdbsynonym . In this file, your synonyms are defined and stored. Go back to the calculation view editor and you should see the two tables in the join node.

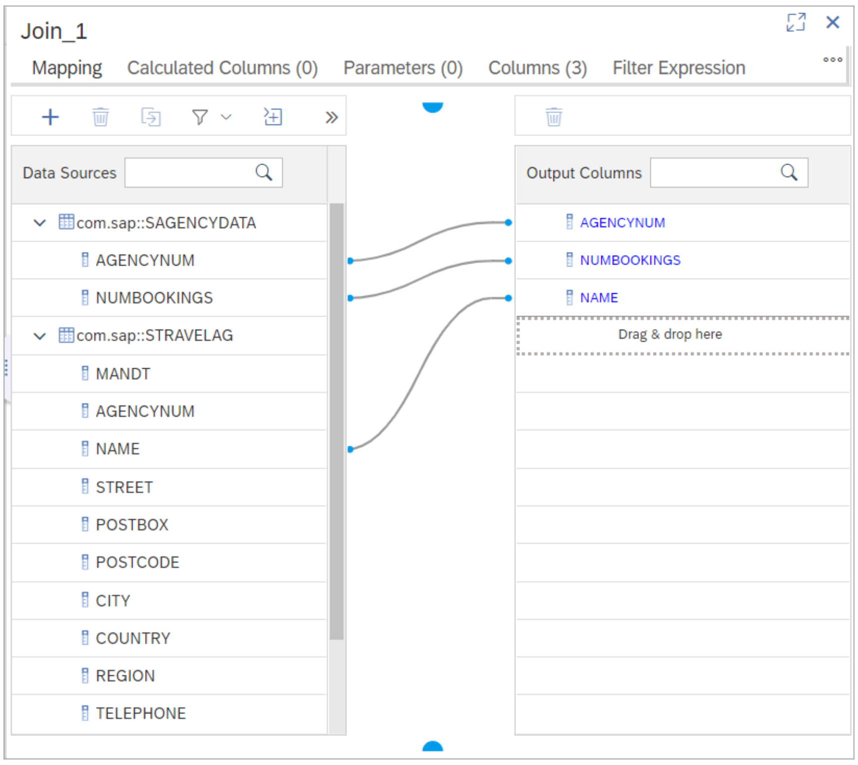


- Define the mapping of the join node

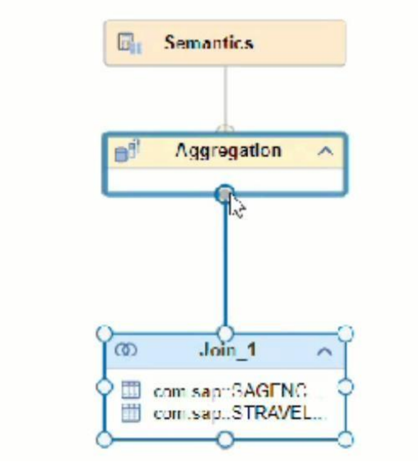
To properly join the two tables, you need to define how they relate to each other. This is done by editing the join node. Double click the join node to open the settings. Under Join Definition, click on the column AGENCYNUM from one of the tables and drag and drop it on top of the same column from the second table. This determines the key column.



Click on the Mapping tab. Here you can select which columns will be part of the output. Select the columns AGENCYNUM , NUMBOOKING , and NAME by double clicking on them. You can see they are added to the output section on the right.

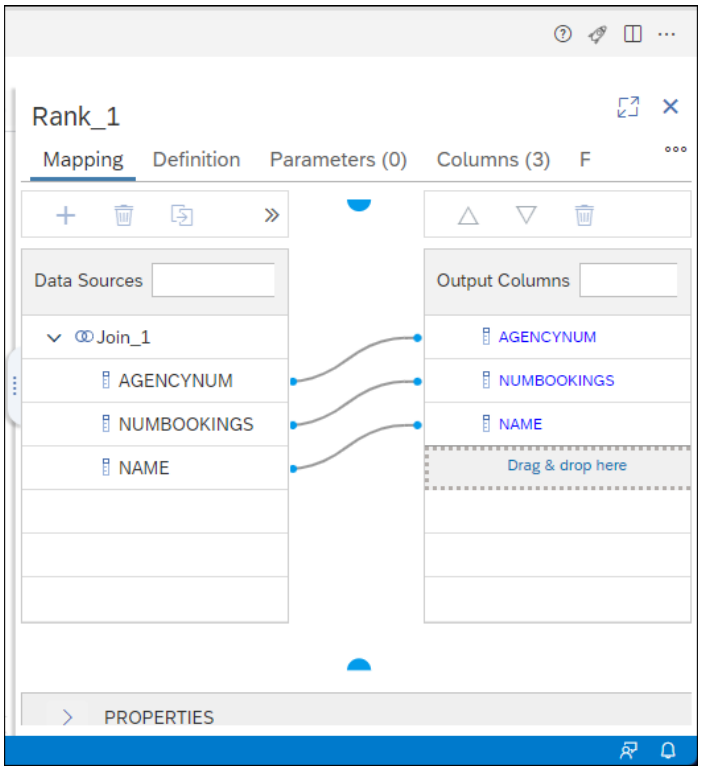


Close the join settings by clicking on the X icon at the top right corner. Now connect the join node to the aggregation node above it. Just click on the arrow icon of the join node and drag and drop it on the aggregation node.



- Add a rank node

Since we want to see the top 5 results from this join, we will add a Rank node next. Click on the rank icon then click on the link between Join node and Aggregation node. This will add a Rank node in between them. Next, double click the Rank node to open the settings. Under Mapping, make sure all 3 columns are included in the output.

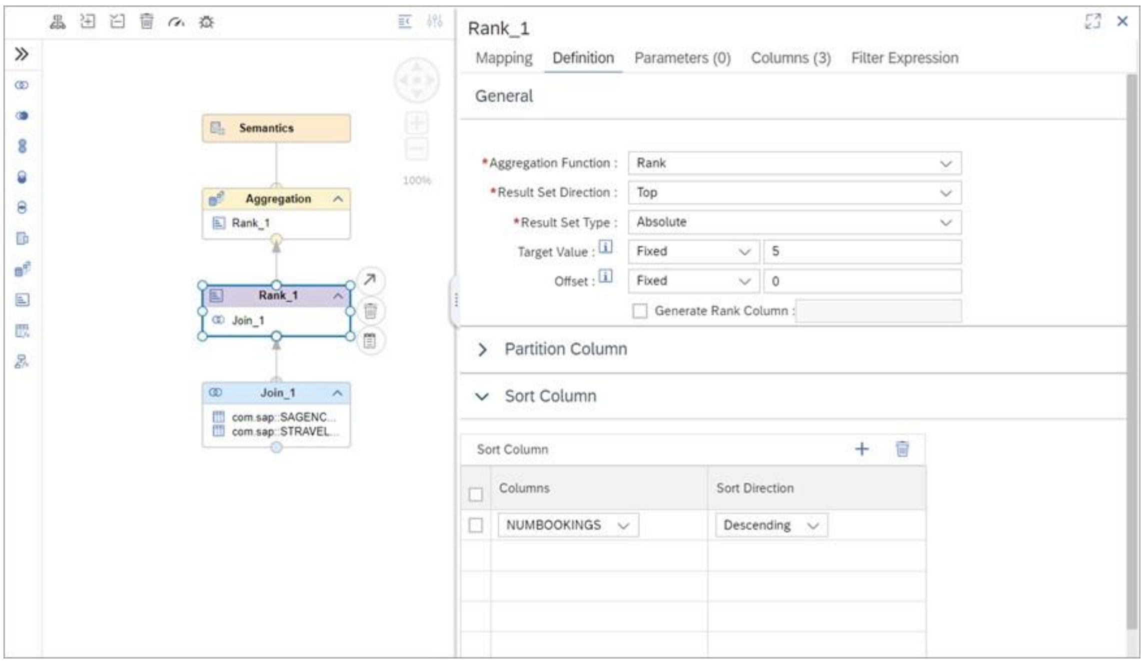


Join_1: AGENCYNUM, NUMBOOKINGS, NAME

Output Columns: AGENCYNUM, NUMBOOKINGS, NAME

Click on Definition. Choose the Aggregation Function as Rank. Set the Result Set Direction as Top. This will order the results descending from highest to lowest. Set the Result Set Type as Absolute. This setting determines the unit of values given out by the rank. You could, for example, also select Percentage here to get the top 10% of results. On the Target Value, type 5. This will determine the number of values given out as a result. The Offset should be 0. Offset determines a number of values that are skipped in the result, for example, with an Offset = 1 the first value of the rank result would not be reported.

Then click on Sort Column to expand this area. Click on the plus icon to add a Sort Setting. Select the column NUMBOOKINGS and the direction as Descending.



Rank_1

Mapping | Definition | Parameters (0) | Columns (3) | Filter Expression

General

*Aggregation Function : Rank

*Result Set Direction : Top

*Result Set Type : Absolute

Target Value : Fixed | 5

Offset : Fixed | 0

□ Generate Rank Column :

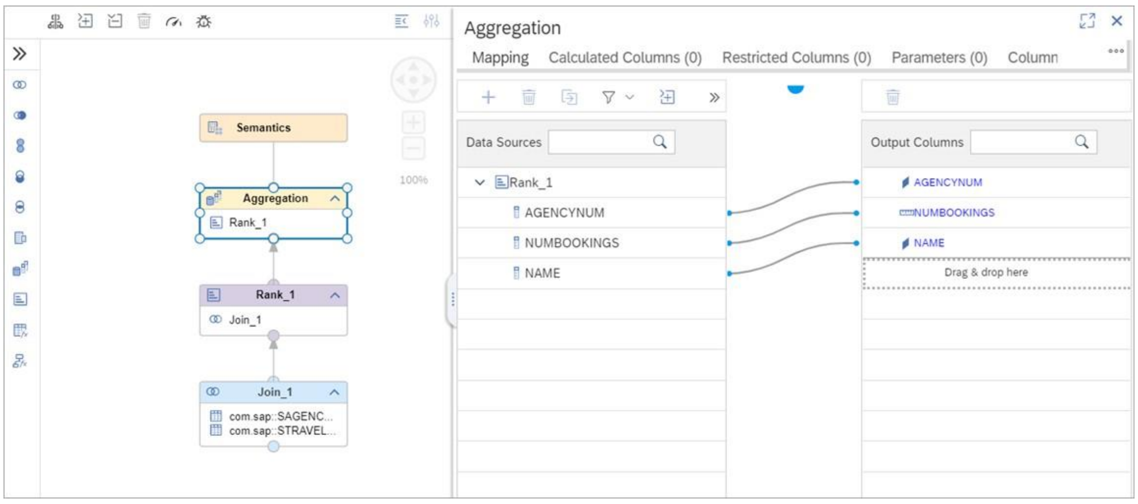
Partition Column

Sort Column

Sort Column

□	Columns	Sort Direction
□	NUMBOOKINGS	Descending

Now close the Rank node panel and double click on the Aggregation node. Under Mapping, make sure all columns are selected as part of the output. If a column is not mapped to the output, double click it to add it.



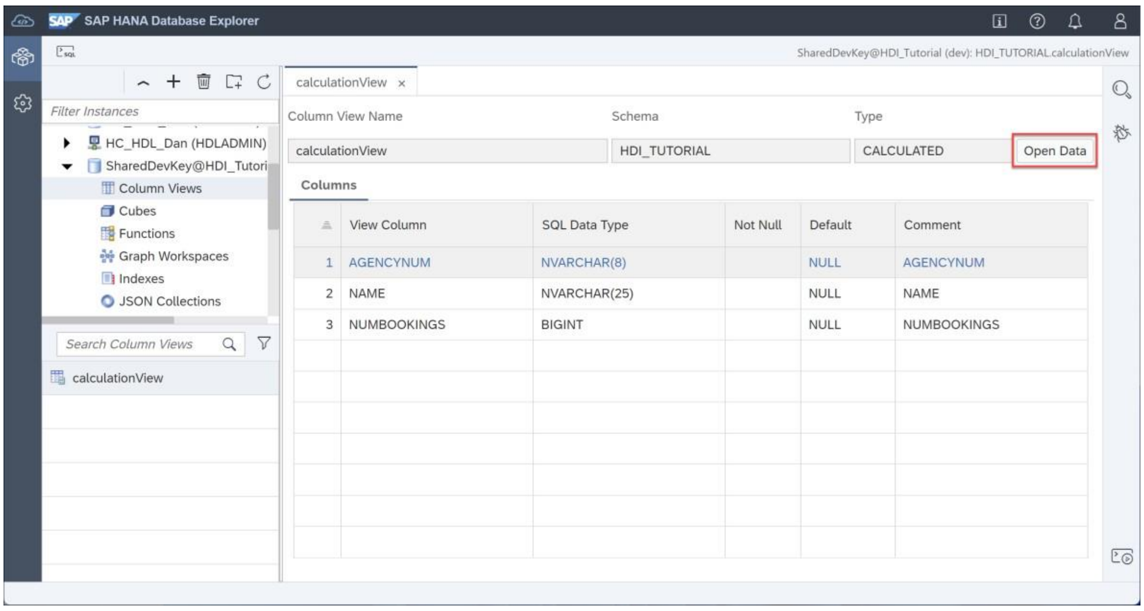
Aggregation

Mapping | Calculated Columns (0) | Restricted Columns (0) | Parameters (0) | Column

Data Sources	Output Columns
Rank_1	AGENCYNUM
AGENCYNUM	NUMBOOKINGS
NUMBOOKINGS	NAME
NAME	Drag & drop here

- Deploy the Calculation View

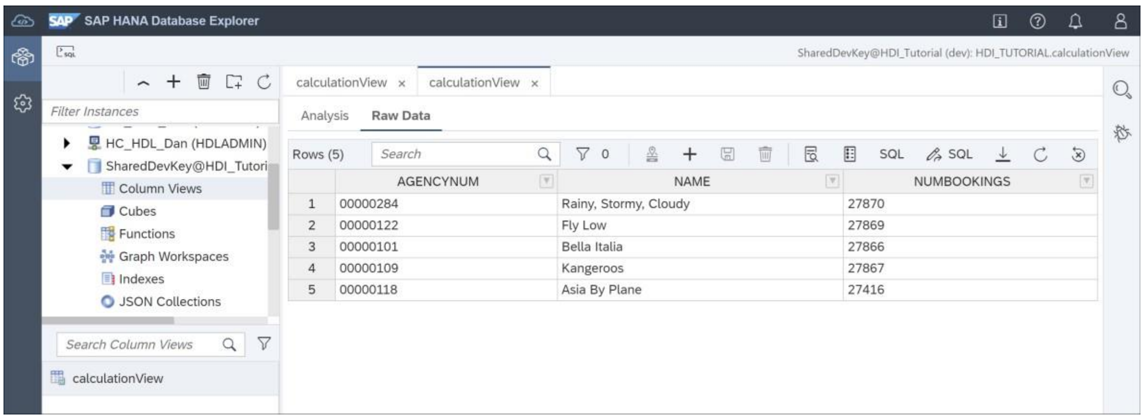
In the SAP HANA Project panel next to the calculation view name or on the top right corner of the screen, click on the deploy icon. This will deploy the calculation view. Once this is successfully completed, it’s time to check the output so far. To access the data preview, click on the HDI container icon next to the name of the project. On the list of databases, you will now see the HDI container that represents your calculation view. Expand the catalog of that HDI container, then click on Column Views. Next, click on the name of your calculation view on the panel below the catalog and click on Open Data.



Column View Name	Schema	Type
calculationView	HDI_TUTORIAL	CALCULATED

	View Column	SQL Data Type	Not Null	Default	Comment
1	AGENCYNUM	NVARCHAR(8)		NULL	AGENCYNUM
2	NAME	NVARCHAR(25)		NULL	NAME
3	NUMBOOKINGS	BIGINT		NULL	NUMBOOKINGS

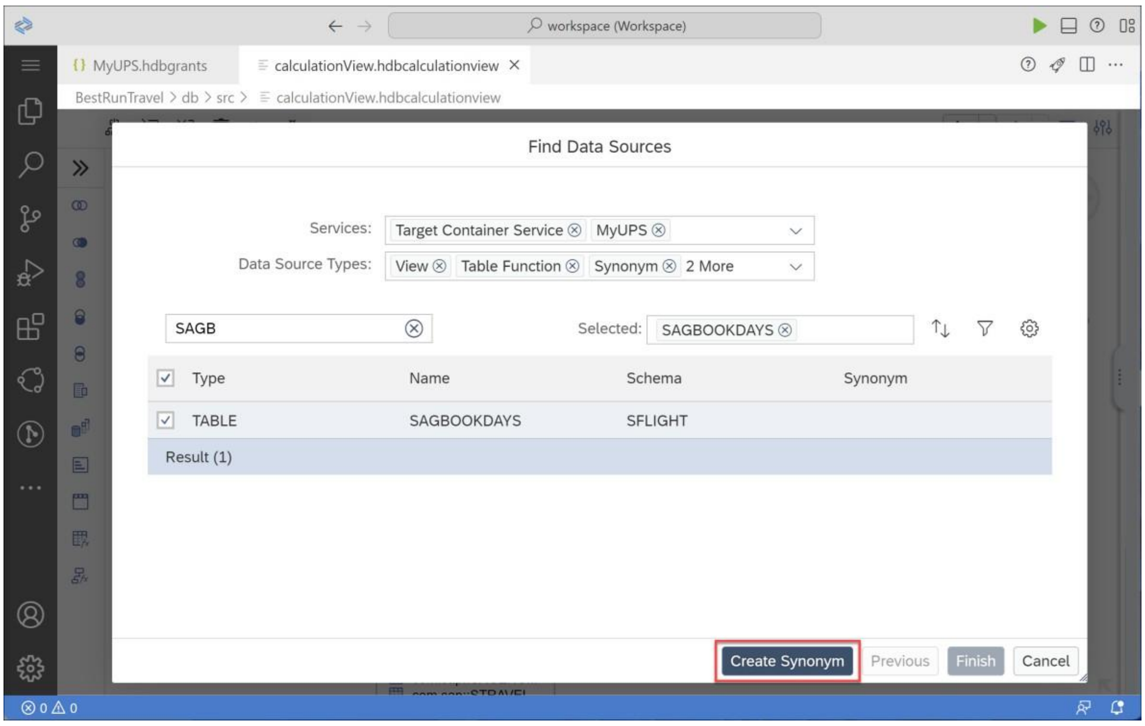
Then, click on Raw Data to see the output of this calculation view so far. This shows you the top 5 partners of Best Run Travel.



	AGENCYNUM	NAME	NUMBOOKINGS
1	00000284	Rainy, Stormy, Cloudy	27870
2	00000122	Fly Low	27869
3	00000101	Bella Italia	27866
4	00000109	Kangeroos	27867
5	00000118	Asia By Plane	27416

- Add a third table to the view

Now that we know the top 5 partners, we need to next find out on which days the top 5 travel agencies have the most bookings. To achieve this, we will add the table SAGBOOKDAYS to our view. We will join the output of our rank node to the table SAGBOOKDAYS, which we previously created. Add a join node between the rank node and the aggregation node. Since the Join node is connected to Rank 1, its output is already added to the join node. So, you only need to add the SAGBOOKDAYS table by clicking on the plus icon. Follow the steps you previously took to add a table and create a synonym.


workspace (Workspace)
MyUPS.hdbgrants
calculationView.hdbcalculationview
BestRunTravel > db > src > calculationView.hdbcalculationview
Find Data Sources
Create Synonym
Previous
Finish
Cancel
⊗ 0 △ 0

Services: Target Container Service ⊗ MyUPS ⊗

Data Source Types: View ⊗ Table Function ⊗ Synonym ⊗ 2 More

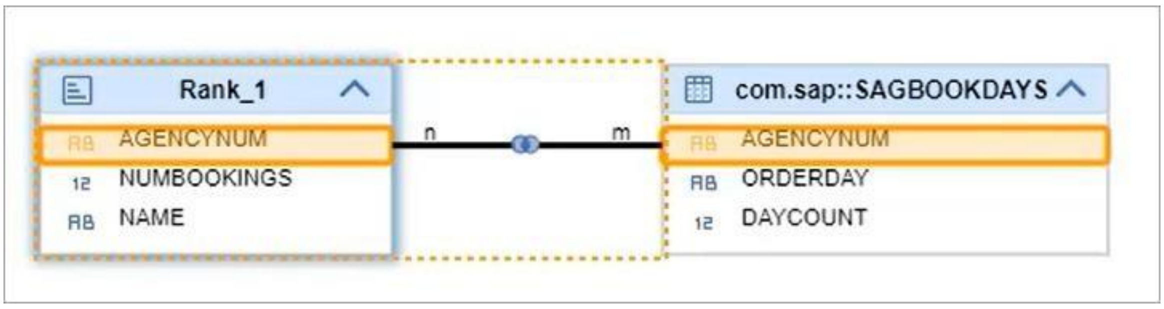
SAGB

Selected: SAGBOOKDAYS ⊗

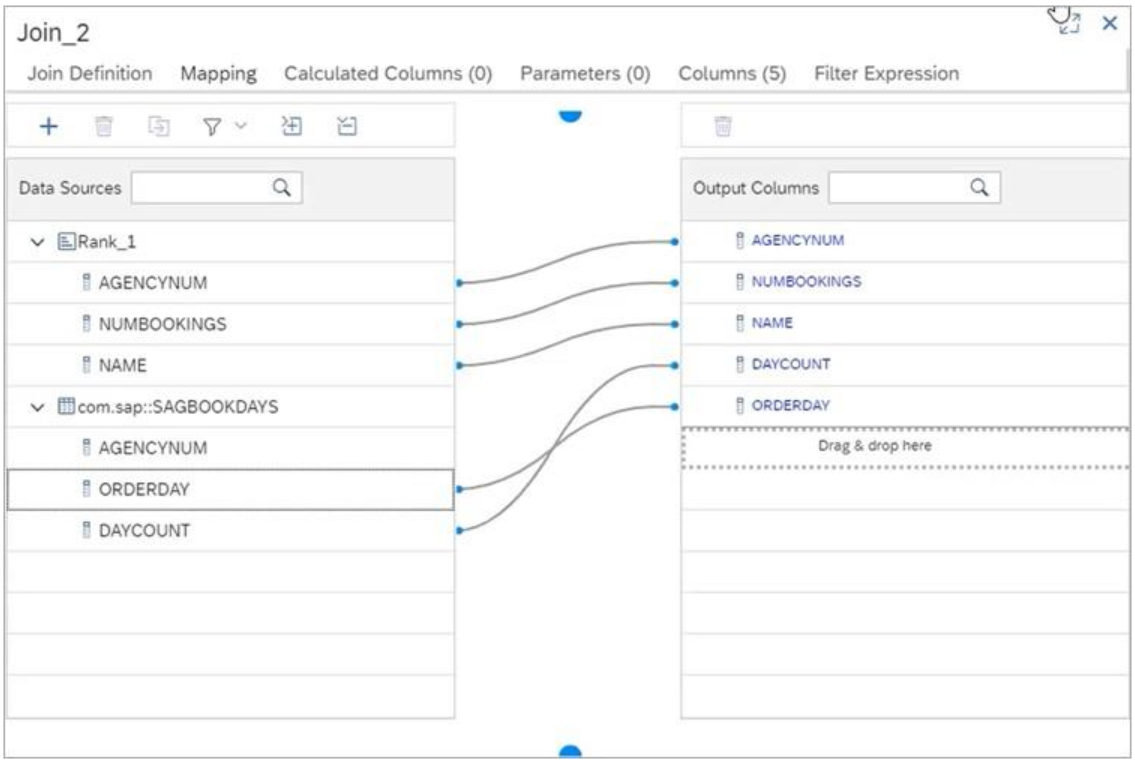
☑ Type	Name	Schema	Synonym
☑ TABLE	SAGBOOKDAYS	SFLIGHT	

Result (1)

After the table is there, double click on the second join node. Under Join Definition, connect the column AGENCYNUM from Rank 1 to the AGENCYNUM column from the SAGBOOKDAYS table.

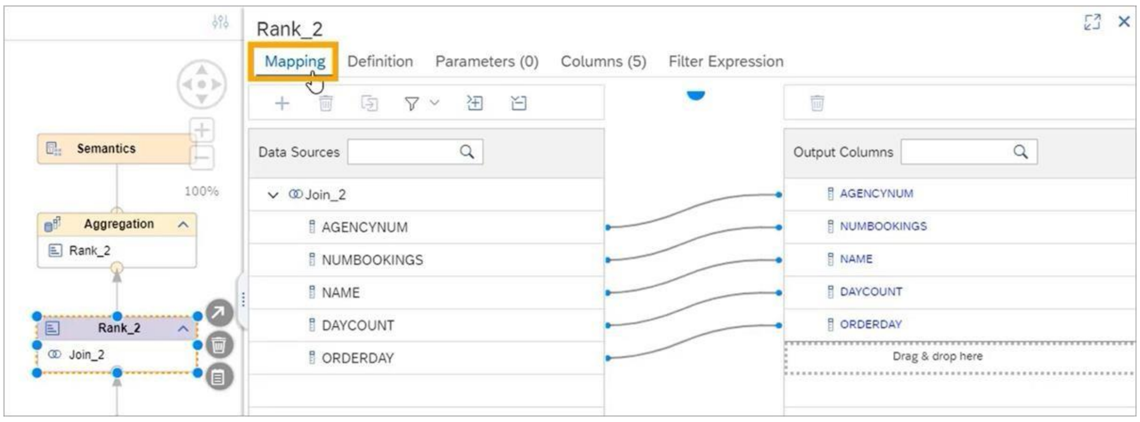


On the same panel, under Mapping, make sure the following columns are selected for the output: AGENCYNUM , NUMBOOKING , NAME , ORDERDAY and DAYCOUNT .



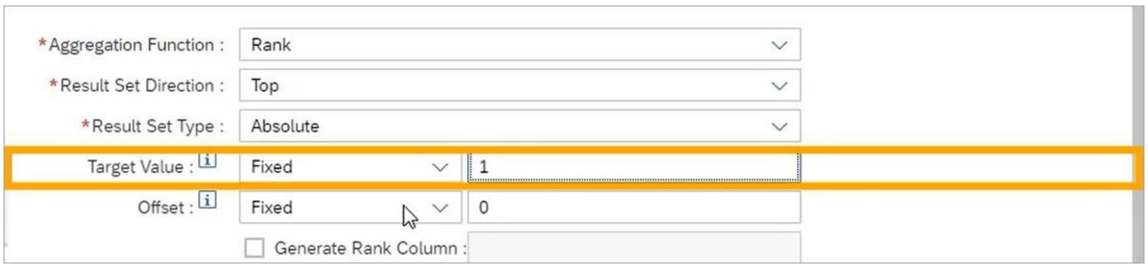
- Add another rank node

To find the days with the most bookings, add another rank node between Join 2 and the Aggregation node. Click on the rank icon and then on the connection between the Join 2 and the Aggregation nodes. Double click the rank node to open it. Under Mapping, make sure all 5 columns appear in the Output Columns. If not, double click to add them.



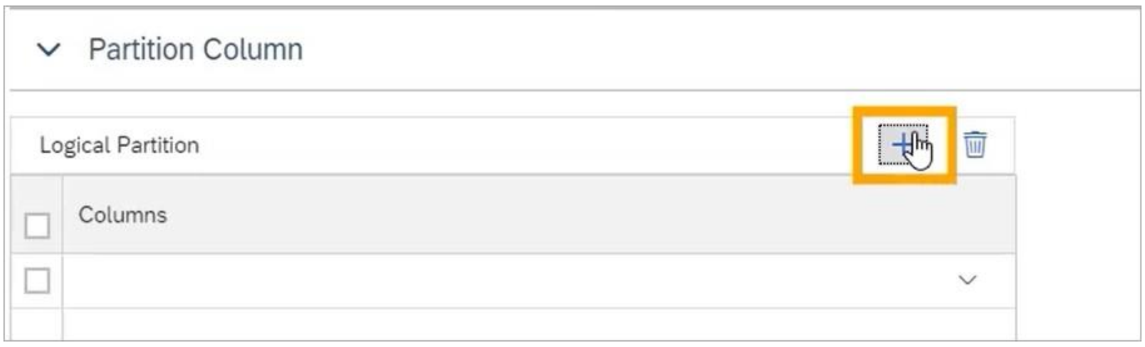
Then, click on Definition. Adjust the settings:

- Aggregation Function: Rank
- Result Set Direction: Top
- Result Set Type: Absolute
- Target Value: 1
- Offset: 0

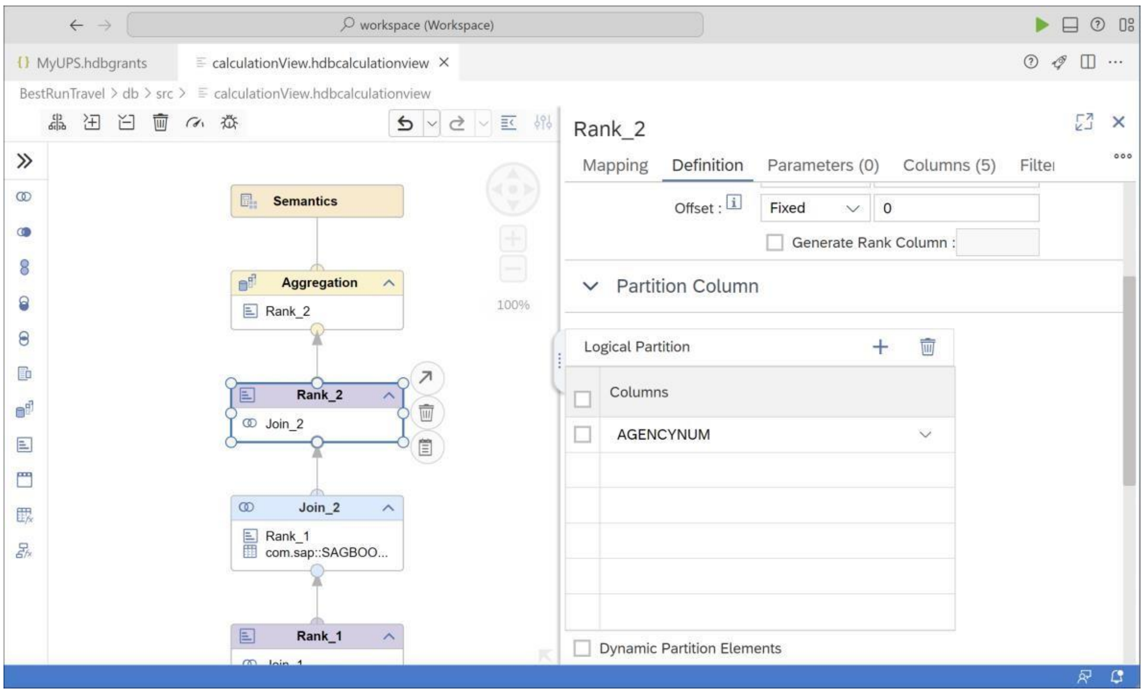


*Aggregation Function :	Rank	
*Result Set Direction :	Top	
*Result Set Type :	Absolute	
Target Value :	Fixed	1
Offset :	Fixed	0
	□ Generate Rank Column :	

Now click on the Partition Column area, and then click on the plus icon. What does a partition column do? Defining a partition column will group the rows of the output based on a specific column.



Add the column AGENCYNUM to group the rows based on this column.



Rank_2

Offset : Fixed 0

□ Generate Rank Column :

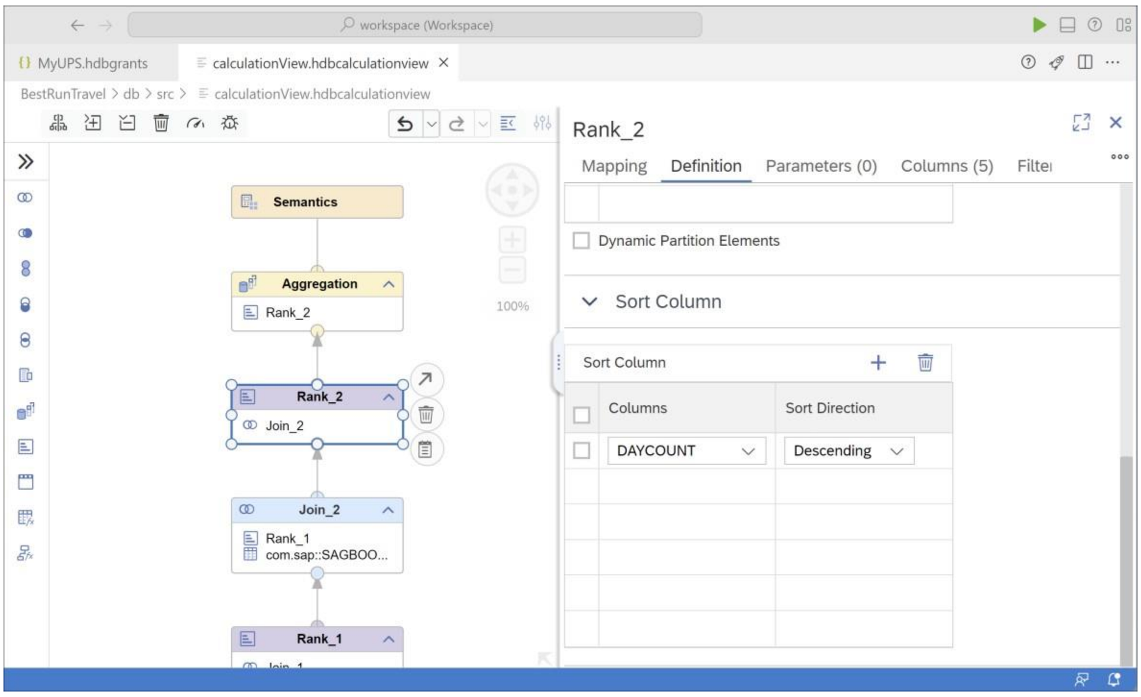
Partition Column

Logical Partition

□	Columns
□	AGENCYNUM

□ Dynamic Partition Elements

Click on Sort Column and click on the plus icon. Add the column DAYCOUNT and select the sort direction as Descending. You can now close the rank settings.



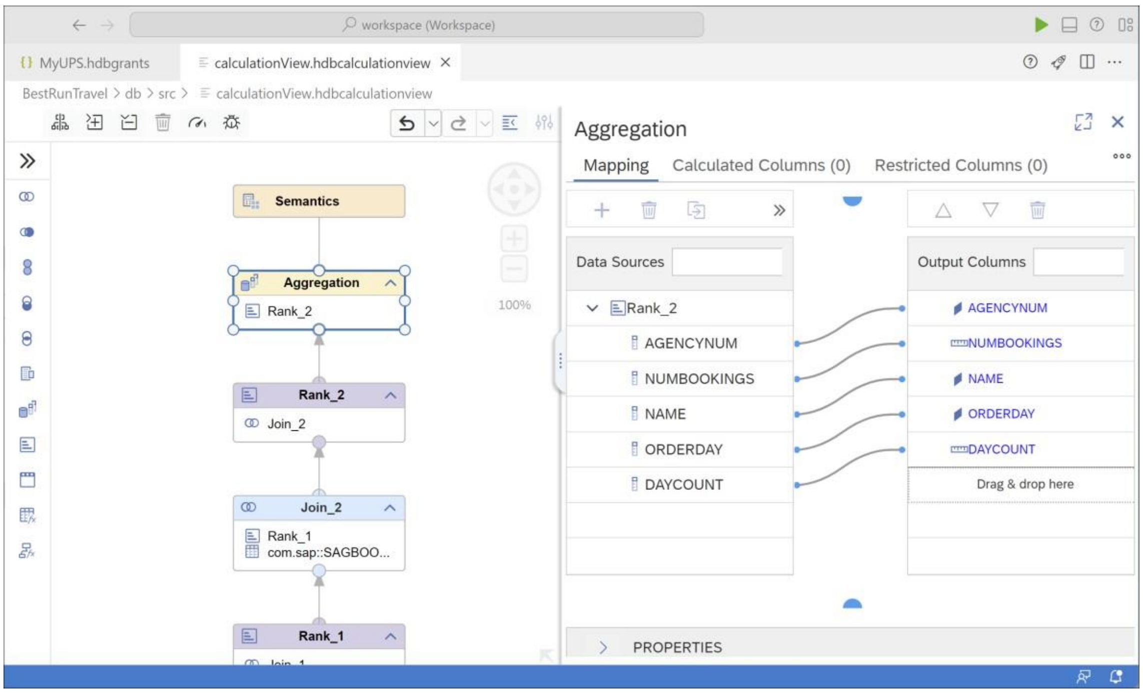
Rank_2

□ Dynamic Partition Elements

Sort Column

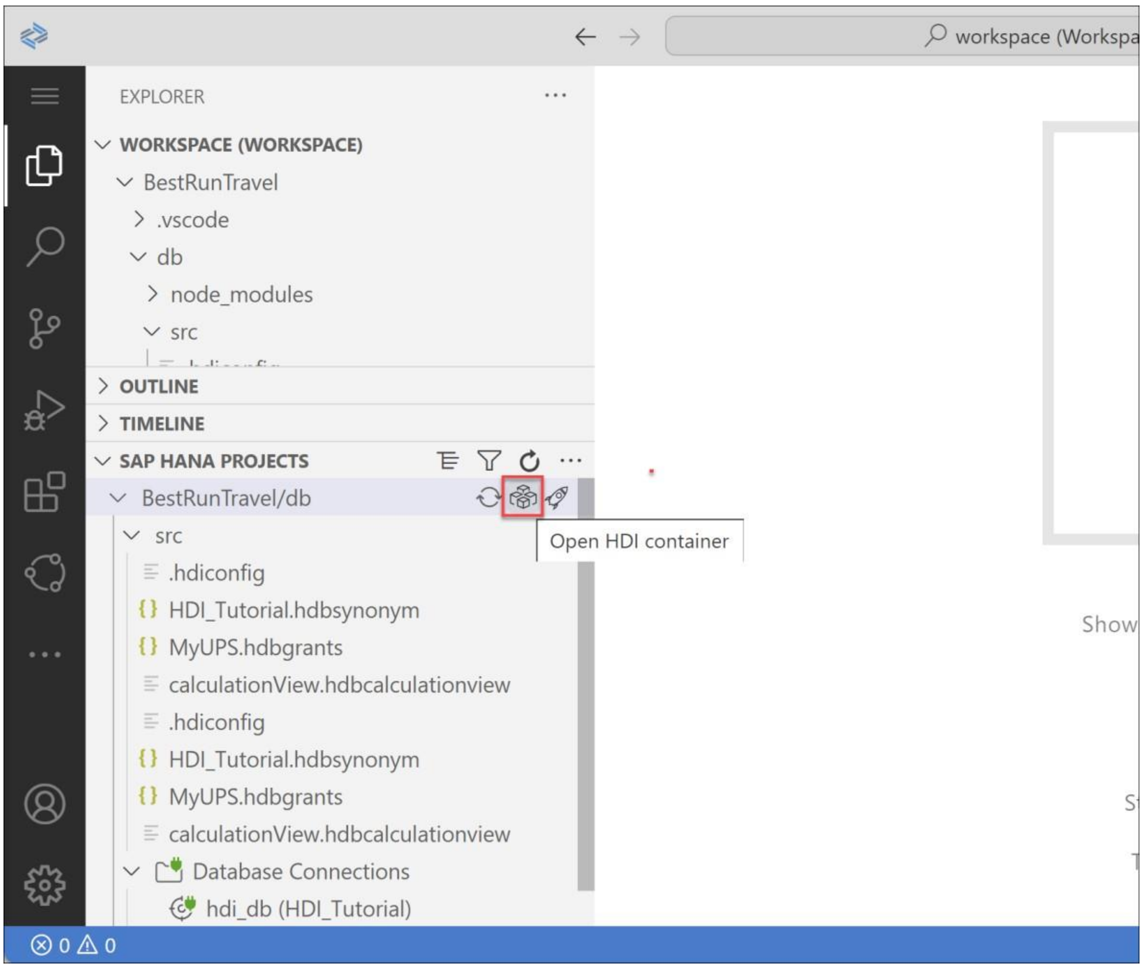
□	Columns	Sort Direction
□	DAYCOUNT	Descending

Double click the Aggregation node. Under Mapping, make sure all the columns under the Rank are selected for the output. To add a column to the output, simply double click it.

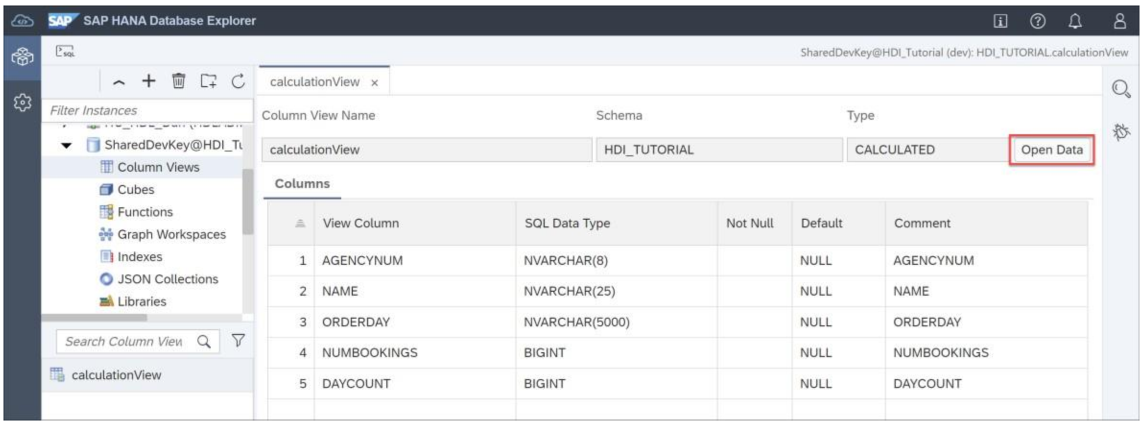


- Deploy the view and access the output

On the SAP HANA Project panel, click on the deploy icon next to the calculation view name. This will deploy the calculation view. Once this is successfully completed, it's time to check the output again. To access the Data Preview in the SAP HANA database explorer, click on the HDI container icon next to the name of the project or access it directly.



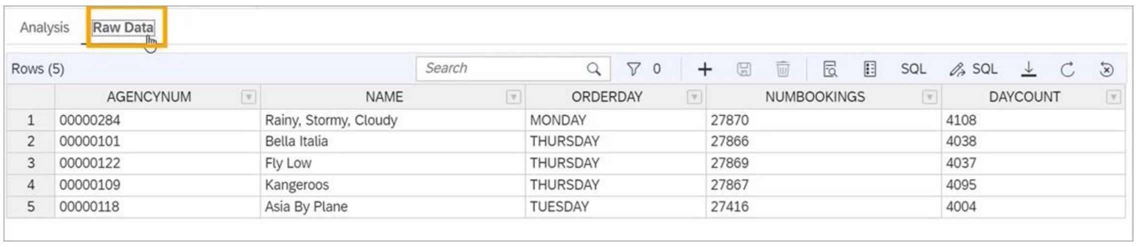
On the list of databases, you will now see the HDI container that represents your project. Expand the catalog of that HDI container, then click on Column Views to find your calculation view. Next, click on the name of your calculation view on the panel below the catalog. Then click on Open Data.



Column View Name	Schema	Type
calculationView	HDI_TUTORIAL	CALCULATED

	View Column	SQL Data Type	Not Null	Default	Comment
1	AGENCYNUM	NVARCHAR(8)		NULL	AGENCYNUM
2	NAME	NVARCHAR(25)		NULL	NAME
3	ORDERDAY	NVARCHAR(5000)		NULL	ORDERDAY
4	NUMBOOKINGS	BIGINT		NULL	NUMBOOKINGS
5	DAYCOUNT	BIGINT		NULL	DAYCOUNT

From here, you can click on Raw Data to see the output of this calculation view. This shows you the top 5 partners of Best Run Travel and the day in which they have the most bookings.



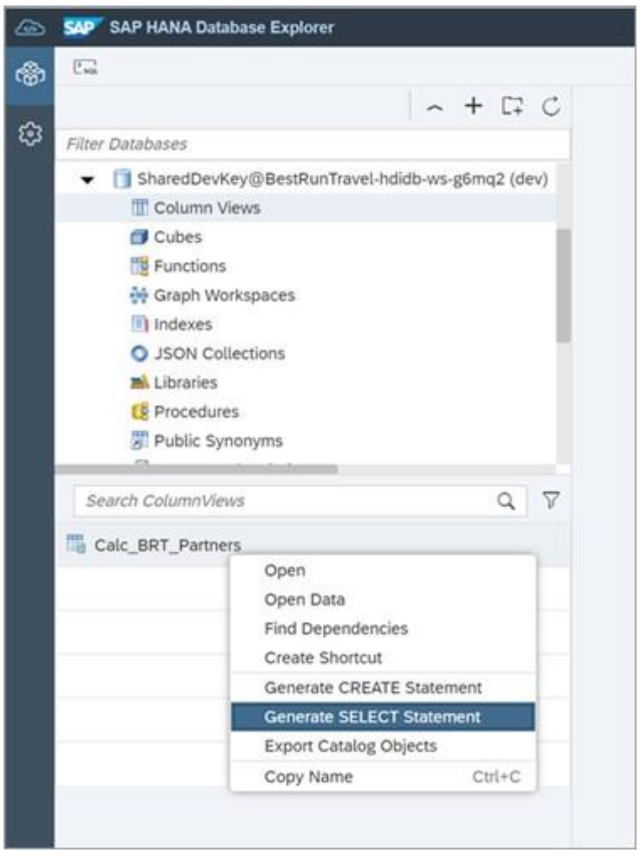
	AGENCYNUM	NAME	ORDERDAY	NUMBOOKINGS	DAYCOUNT
1	00000284	Rainy, Stormy, Cloudy	MONDAY	27870	4108
2	00000101	Bella Italia	THURSDAY	27866	4038
3	00000122	Fly Low	THURSDAY	27869	4037
4	00000109	Kangeroos	THURSDAY	27867	4095
5	00000118	Asia By Plane	TUESDAY	27416	4004

Modul 8 : Share a Subset of Your Data Securely

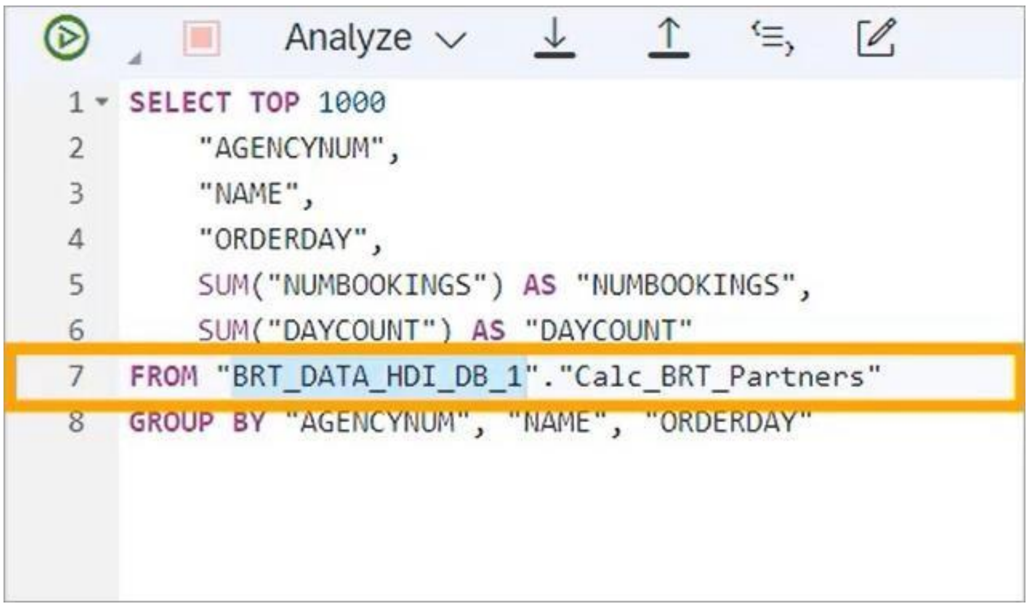
- Generate a SELECT statement on the column view

To allow others to see the results of your calculation view, you need to grant them the privilege to run `SELECT` statements on this calculation view. To run `SELECT` statements on calculation views in the new environment, first make sure that the you have the correct schema name. This schema is not the `SFLIGHT` schema we previously created, but rather the schema automatically created for the calculation view.

To find out the schema name, open the SAP HANA database explorer. Find your HDI container in the catalog. Click on Column Views. Right-click on the column view name on the bottom panel and choose to Generate a SELECT Statement.



This will open the SQL Console on the main area of the screen with the `SELECT` statement. On `line 7` you can see a `FROM` clause with two arguments separated by a `.`. The first part is the schema name, the second part is the calculation view name. Copy the name of the schema and save it for later, for example, using a text editor. Keep this SQL console open.

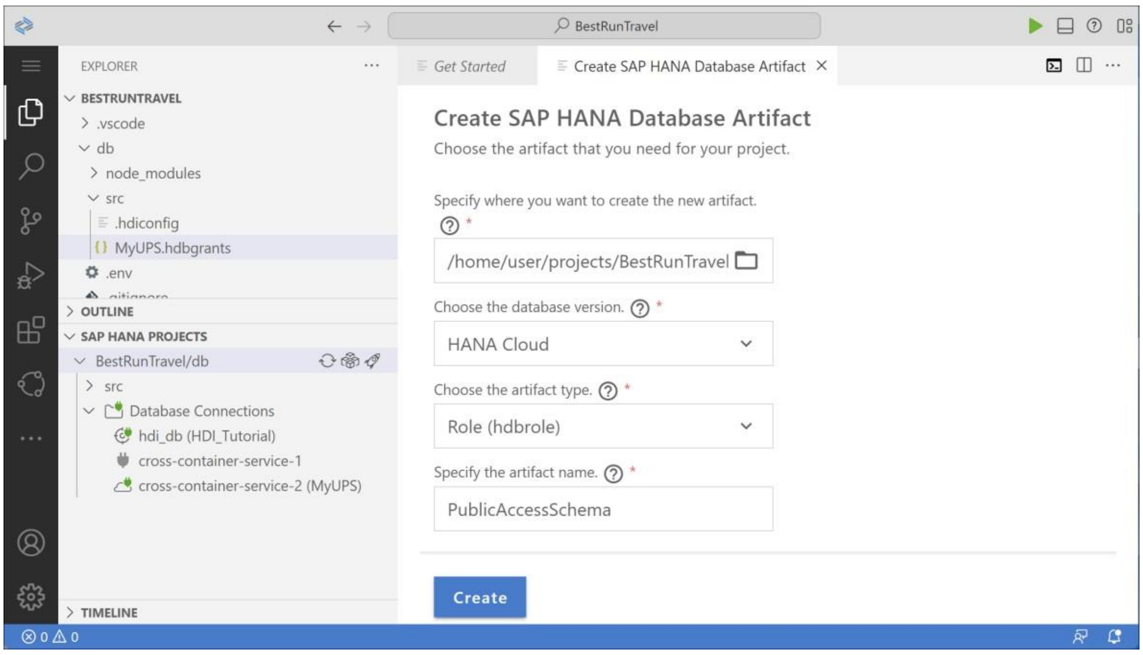


```
SELECT TOP 1000
    "AGENCYNUM",
    "NAME",
    "ORDERDAY",
    SUM("NUMBOOKINGS") AS "NUMBOOKINGS",
    SUM("DAYCOUNT") AS "DAYCOUNT"
FROM "BRT_DATA_HDI_DB_1"."Calc_BRT_Partners"
GROUP BY "AGENCYNUM", "NAME", "ORDERDAY"
```

- Create a role

Now that you have the right schema name, next you will have to grant the authorization to `SELECT` on the Calculation View. This is done by creating an `.hdbrole` file in your development project that grants the `SELECT` privilege.

Go to your project in SAP Business Application Studio and start your development space if needed.You need the command SAP HANA: Create HANA database artifact. Access it by clicking on View on the top menu and selecting Find command or pressing `Ctrl+Shift+P`. Type `SAP HANA` and select it from the list. In the wizard, make sure the path to save the role file is in the `src` folder of your project. Choose the database version HANA Cloud. Select the artifact type as `**Role (hdbrole)**`. Name your role `PublicAccessSchema`. Finally, click on Create.



Create SAP HANA Database Artifact

Choose the artifact that you need for your project.

Specify where you want to create the new artifact. * : /home/user/projects/BestRunTravel

Choose the database version. * : HANA Cloud

Choose the artifact type. * : Role (hdbrole)

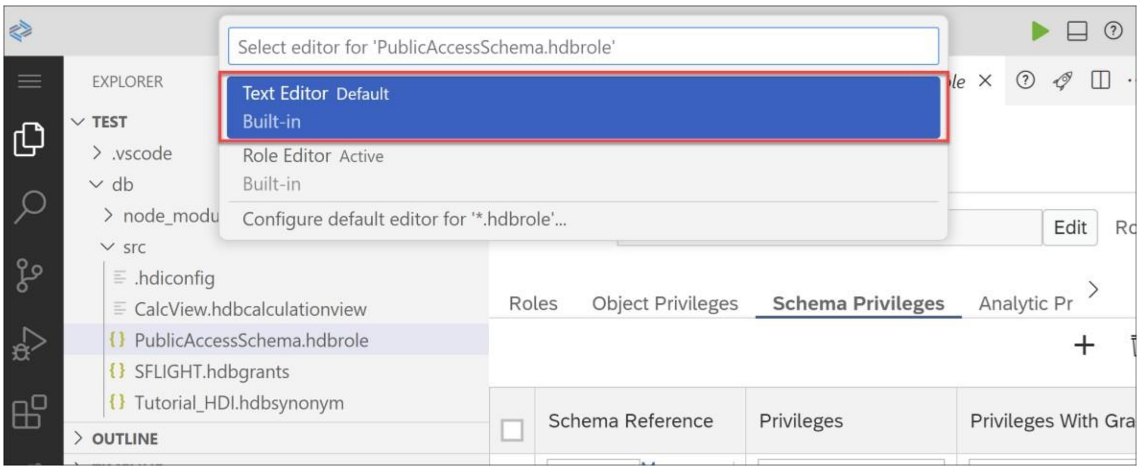
Specify the artifact name. * : PublicAccessSchema

Create

Your role will appear in the file explorer of your project and you can add privileges to it.

- Add privileges to the role

In this step, you have two options to add privileges to your role: You can use the Role Editor wizard or the Text Editor. Click on the option you prefer under the title of this step. The goal in this step is to add the schema privileges `SELECT` and `EXECUTE` to the role `PublicAccessSchema.` Right-click on the `.hdbrole` file, select Open with, then choose Text Editor when prompted at the top of the screen.



Paste the following statements there. Alternatively, you can download this code from the public GitHub repository.

```
{
    "role": {
        "name": "flublicAccessSchema",
        "schema_privileges": [
            {
                "privileges": [
                    "SELECT",
                    "EXECUTE"

                ]
            }
        ]
    }
}
```

Note that, if you have added a namespace to your `db` folder, you will have to edit the syntax to include that. Before `PublicAccessSchema`, add your namespace and `::`. Deploy the `.hdbrole` file by clicking on the deploy icon next to it on the SAP HANA Projects panel or on the top right corner of the main panel. After you are done, deploy the whole project again. When that is completed successfully, you may continue.

- Create a new user in the SAP HANA database explorer

Now that you have the role created and granted privileges to this role, it’s time to grant this role to a user. We will create the public user report that shall have read-only access to the calculation view. Go back to your tab with the SAP HANA database explorer and open a SQL Console by clicking on the SQL icon at the top left corner. Make sure that the connection is opened for an user that has system privileges ROLE ADMIN and USER ADMIN , e.g., database user DBADMIN .

Paste the following statement in the SQL Console. Change the password in the statement and then run.

```
CREATE USER report flASSWORD <your_password> NO FORCE_FIRST_flASSWORD_CHANGE set
usergroup default;
```

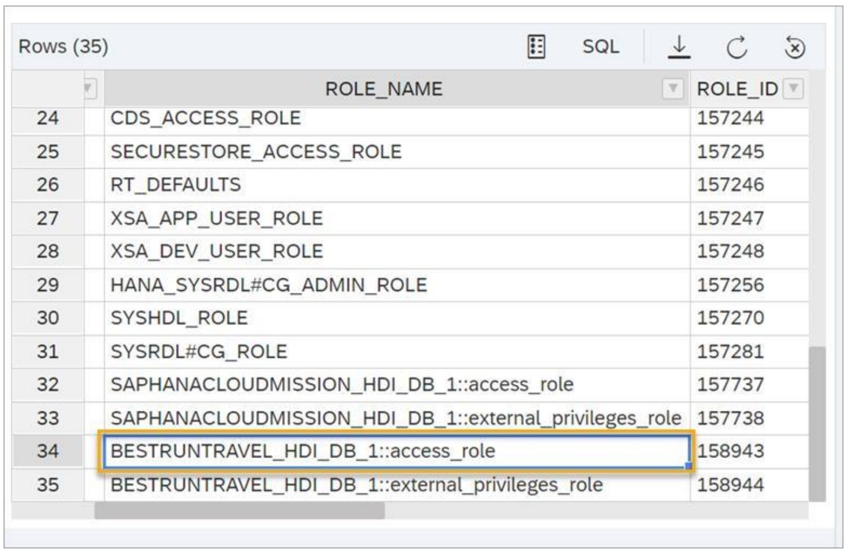
Now that our new user report is created, we need to grant the user access to the role PublicAccessSchema . Use the following statement.

```
GRANT <SCHEMA_NAME>."flublicAccessSchema" to report;
```

Replace the <schema name> with the calculation view schema you copied in the beginning. Make sure to remove the <> characters and then run the statement.

You can also use the default role that has the container name.default access. As soon as an HDI container is created, the default access role is created. You can find the name of the role by using the statement SELECT * FROM ROLES

The role you are looking for should consist of the schema name and the role name access_role .



Rows (35)

	ROLE_NAME	ROLE_ID
24	CDS_ACCESS_ROLE	157244
25	SECURESTORE_ACCESS_ROLE	157245
26	RT_DEFAULTS	157246
27	XSA_APP_USER_ROLE	157247
28	XSA_DEV_USER_ROLE	157248
29	HANA_SYSRDL#CG_ADMIN_ROLE	157256
30	SYSHDL_ROLE	157270
31	SYSRDL#CG_ROLE	157281
32	SAPHANACLOUDMISSION_HDI_DB_1::access_role	157737
33	SAPHANACLOUDMISSION_HDI_DB_1::external_privileges_role	157738
34	BESTRUNTRAVEL_HDI_DB_1::access_role	158943
35	BESTRUNTRAVEL_HDI_DB_1::external_privileges_role	158944

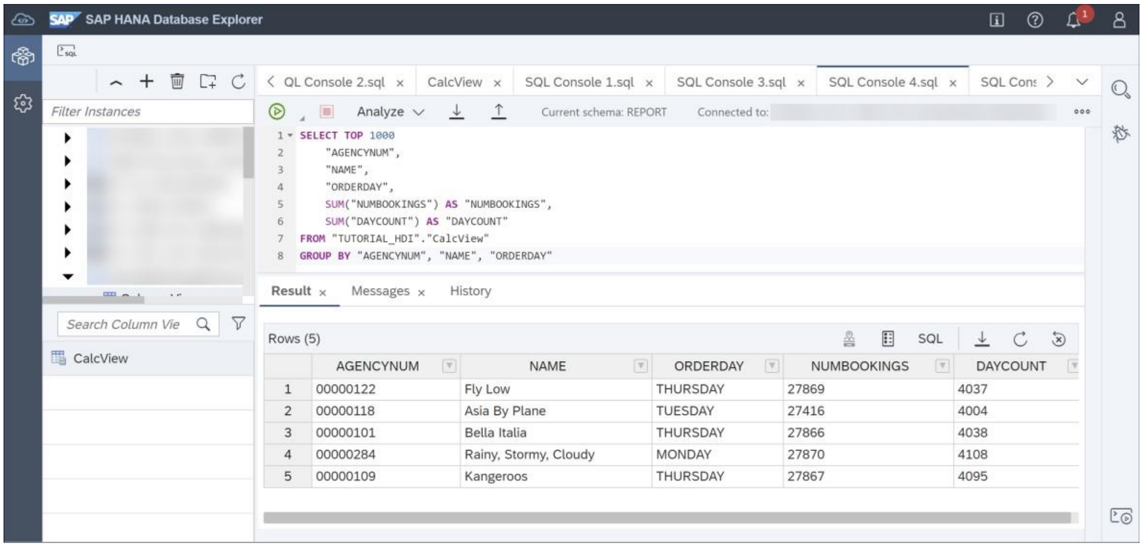
If you don’t need a customized role, you can use this one. In a productive system, we recommend creating your own roles with just the privileges needed.

- Connect as the new user

You have successfully created the new user report and assigned it a role to access your calculation view. With the new user credentials, anyone who has the credentials for this user can run SELECT statements on your calculation view. To test this, first log in with your new user by typing the following statement:

```
CONNECT report flASSWORD <Your_flassword>
```

You should now see at the top of the screen, over the SQL console the user you connected with. Since you granted this user SELECT privileges, you should be able to run SELECT statements on the column view. Go back to the SQL console you opened, when you generated a SELECT statement of the column view. Copy the whole statement from this SQL console and paste it to the console that you used to connect with the user report. Execute the statement using the report -user console. When you see the result of this query you know that your test was successful, and the user can now access your view.



Current schema: REPORT Connected to: [redacted]

```sql
SELECT TOP 1000
    "AGENCYNUM",
    "NAME",
    "ORDERDAY",
    SUM("NUMBOOKINGS") AS "NUMBOOKINGS",
    SUM("DAYCOUNT") AS "DAYCOUNT"
FROM "TUTORIAL_HDI"."CalcView"
GROUP BY "AGENCYNUM", "NAME", "ORDERDAY"
```

Rows (5)

	AGENCYNUM	NAME	ORDERDAY	NUMBOOKINGS	DAYCOUNT
1	00000122	Fly Low	THURSDAY	27869	4037
2	00000118	Asia By Plane	TUESDAY	27416	4004
3	00000101	Bella Italia	THURSDAY	27866	4038
4	00000284	Rainy, Stormy, Cloudy	MONDAY	27870	4108
5	00000109	Kangeroos	THURSDAY	27867	4095