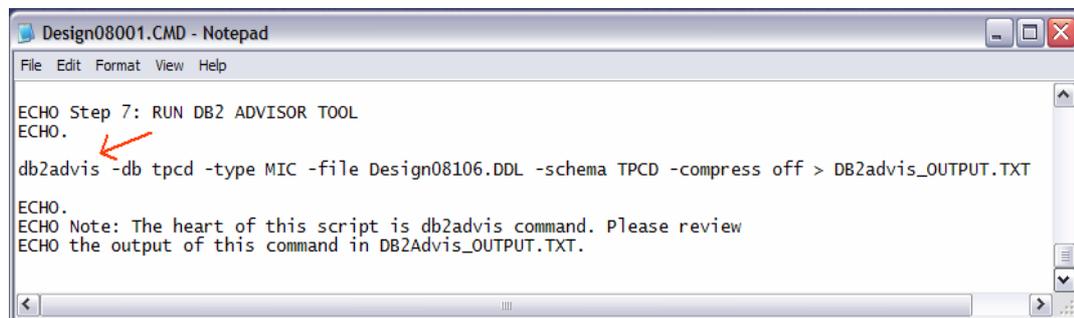


LAB 08 – DESIGN ADVISOR

A. RUN DB2 DESIGN ADVISOR (DB2ADVIS COMMAND)

1. Get in a DB2 Command Window
2. Go to the directory `C:\POT\08 Design`
3. Run command `C:\POT\08 Design>Design08001`. This command does the following steps:
 - Drop TPCD database if it exists.
 - Create TPCD database using `Design08101.DDL`.
 - Create all tables using `Design08102.DDL`
 - Load data in tables using `Design08103.DDL`
 - Update all tables' statistics using `Design08104.DDL`
 - Create EXPLAIN tables using `Design08105`
 - Run DB2ADVIS using `Design08106.DDL` as a workload for DB2ADVIS command



```
Design08001.CMD - Notepad
File Edit Format View Help

ECHO Step 7: RUN DB2 ADVISOR TOOL
ECHO.
db2advvis -db tpcd -type MIC -file Design08106.DDL -schema TPCD -compress off > DB2advvis_OUTPUT.TXT
ECHO.
ECHO Note: The heart of this script is db2advvis command. Please review
ECHO the output of this command in DB2Advvis_OUTPUT.TXT.
```

4. Review the output (`DB2ADVIS_OUTPUT.TXT` file) of DB2ADVIS command for recommendations.

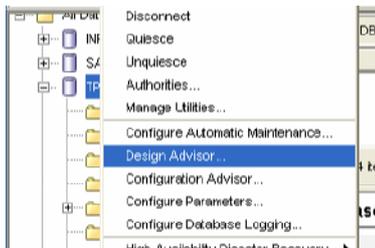
Note: The above command `Design08001.cmd` takes about 8-10 minutes to complete. This command can be run at the start of the “Design” presentation and the output can be reviewed at the start of this lab exercise.

Most of the time this script uses is for setting up the database in order to simulate a real world database scenario. The Design Advisor utility itself only takes a couple of minutes to run in this lab.

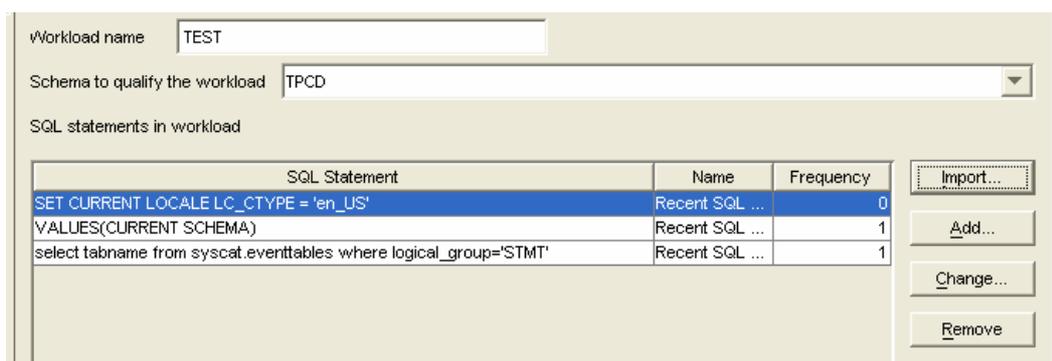
You may get the message “No catalog node table space name has been specified on the command line. Using default” when DB2ADVIS command kicks in. This message is related to “Data Partitioning Feature” and you can ignore it.

B. EXTRA EXERCISE - RUN DB2 DESIGN ADVISOR (GUI)

1. We can run the Design Advisor from Control Center. Right click on the TPCD database in control center and choose Design Advisor option.



2. You will see the first screen of introduction. Click on [Next].
3. The second screen allows you to select the features. Select all features. If we have DPF (Data Partition Feature) installed, we will also see partition option. Go to the next screen.
4. The third screen allows you to “Define work load” for design advisor. The design advisor GUI presents four options to define the work load. These options are:
 - a. Use a text file containing all workload statements with SET FREQUENCY command which can be used to repeat same work load ‘n’ number of times. (The previous example used a workload file `Design08106.DDL` containing workload statements.)
 - b. Use the current SQL cache to capture SQL statements that can be made as a workload.
 - c. Specify your own SQL statements as a work load.
 - d. Use the workload from event monitor tables. This option is available only if event monitors were defined and SQL’s texts were collected in the event monitor SQL tables.

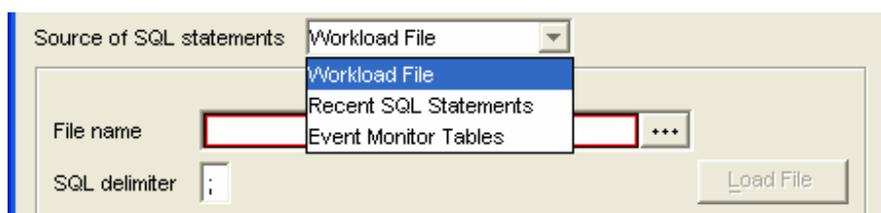


5. Define the name of your workload; call it anything you like.
6. Select the schema as TPCD

Note: The SQL statement window will show the SQL's it captured from the SQL cache. You may or may not see these SQL statements in this window.

You can use your favorite application to run in a production environment. Invoke the design advisor and capture all the dynamic SQL statements from the cache. Use this workload in design advisor to get the recommendation for changes in the database design.

7. If you click "Import" button, you can select the sources of work load as shown below.



8. For this lab exercise, we have created a workload file Design08106.DDL. Please select this file as our workload. Click on workload file and choose Design08106.DDL from "C:\POT\08 Design" directory and click "Load File" button.

Import	SQL Statement	Frequency
<input checked="" type="checkbox"/>	select l_returnflag, l_linestatus...	1
<input checked="" type="checkbox"/>	select s_acctbal,s_name,n_n...	1
<input checked="" type="checkbox"/>	select l_orderkey, sum(l_exte...	1
<input checked="" type="checkbox"/>	select o_orderpriority, count(*...	1
<input checked="" type="checkbox"/>	select n_name, sum(l_extend...	1
<input checked="" type="checkbox"/>	select sum(l_extendedprice * l...	1
<input checked="" type="checkbox"/>	select supp_nation, cust_nati...	1
<input checked="" type="checkbox"/>	selecto_year,sum(case when...	1
<input checked="" type="checkbox"/>	select nation,o_year,sum(amo...	1
<input checked="" type="checkbox"/>	select c_custkey,c_name,su...	1
<input checked="" type="checkbox"/>	select ps_partkey, sum(ps_s...	1
<input checked="" type="checkbox"/>	select l_shipmode, sum(case ...	1
<input checked="" type="checkbox"/>	select c_count, count(*) as c...	1

Note: All the SQL statements from workload file "Design08106.DDL" are loaded in the GUI. You can select which one to use in the load process. The third column is "Frequency". We have defined this to be 'one' in our load file. This can be changed to simulate production system execution count of a particular statement. The SQL statement window will show the SQL's that it captured from SQL cache. You may or may not see these SQL statements in this window.

9. To get them all choose [Select All] then [OK] buttons. Go to [Next] screen.

10. The fourth screen allows you to create statistics on tables. Since we generated statistics for all tables, there is no need to select any table. Go on to the next screen.

11. The next screen allows you to constrain the disk space and provide options for materialized query table options and statistics by sampling options. Use default values and go to the next screen.

Set maximum disk space for the recommended objects MB

Hint: Specifying a disk limit might reduce the number of recommended objects to fit in the space.

Materialized query table options

Table space

Schema name

Derive statistics by sampling

Hint: If you select to derive statistics by sampling, the Design advisor can produce better MQT recommendations, but the calculations will take longer to complete.

12. The next screen allows you to schedule a job to run immediately or later on. This also allows you to define the time limit for design advisor to run. If you remember the search space for the design advisor, it is huge if we choose all four options. It is a good idea to specify a time limit for design advisor to run. The default value is 10 minutes.

When should the calculation start?

Now

Click Now if you expect the calculation to be quick or if you will wait for it to complete. The server starts the calculation as soon as you click Next, and the Design advisor remains open until the calculation is complete.

Later

If you select Later, you can specify when to have the server start the calculation. When you click Finish at the end of the Design advisor, the schedule window opens for you to specify when to have the server start the calculation. When the calculation completes, you can get the results in plain text from the Job History view of the [Journal notebook](#).

Set maximum time to calculate recommendations

If you do not set a [time limit](#), you will get better recommendations because the advisor will take as long as it needs to calculate the recommended objects.

13. If you click next, design advisor GUI invokes `DB2ADVIS` command and runs it with all the input that it collected through the wizard. In the last exercise, you saw that the design advisor can be used at command line, but using GUI is beneficial as you can use SQL's that are in SQL cache or in event monitor tables. Once design advisor finishes its task, review the recommendations. It may take a while to complete this command. Please wait for this to finish.

Performance improvement %

Disk space cost MB

14. You can see the performance improvement suggested by the design advisor if its recommendations are accepted.

▶				
▼ CUSTOMER				
▼ Index				
Index	<input checked="" type="checkbox"/>	Create	IDX409211525150...	+C_
Index	<input checked="" type="checkbox"/>	Keep	C_CK	
▼ LINEITEM				
▼ Index				
Index	<input checked="" type="checkbox"/>	Keep	L_SD	
Index	<input checked="" type="checkbox"/>	Keep	L_OK	
Index	<input checked="" type="checkbox"/>	Keep	L_PK	
Index	<input checked="" type="checkbox"/>	Keep	L_RD	
Index	<input checked="" type="checkbox"/>	Keep	L_PK_SK	
▼ NATION				

Note: You can review all the recommendations that design advisor makes using the workload. The Design Advisor can suggest creation of indexes, materialized query (MQT) tables and multi-dimensional cluster (MDC) tables. If you create these objects, you can get a better performance. This is a unique feature of the Design Advisor. The other database vendors recommend only indexes as other features add a lot of complexities resulting in a huge search space. They just don't do what DB2 does.

15. The next screen gives a list of unused objects that are found using the given workload. DBAs can use discretion to drop these objects if they are not being used by any other application.

▼ "PART"				
▼ Index				
Index	<input type="checkbox"/>	Drop	P_PK	+P_PARTI
▼ PARTSUPP				
▼ Index				
Index	<input type="checkbox"/>	Drop	PS_SK	+PS_SUPI

16. **Don't do this now**, but you could click [Finish] to make all selected options permanent in your database. Do this back at your office when you have more time than this lab allows.

C. CLEANUP

After you are done with the above exercises, you can run the following command to clean up the resources.

```
C:\POT\07 Design>Design08300
```