**DB2 Interview Questions**

**IMP Points**

* UNION and UNION ALL used to combine two or more query results. UNION command selects distinct and related information from two tables which will eliminate duplicate rows. On the other hand, UNION ALL command selects all the values from both the tables, which displays all rows.

**Questions and Explanations**

**001 DB2 concepts**

**Q. What is the physical storage strength of DATE, TIME, TIMESTAMP?**

Ans

1. DATE – 4 Bytes
2. TIME – 3 bytes.
3. TIMESTAMP – 10 bytes.

**Q. What is the COBOL Picture clause for DATE, TIME, TIMESTAMP, DECIMAL(11,2)?**

ANS.

1. DATE – PIC X(10)
2. TIME – PIC X(08)
3. TIMESTAMP – PIC X(26).
4. DECIMAL(11,2) – PIC 9(09)V9(02) COMP-3

**Q. Give COBOL definition of VARCHAR field.**

ANS.

01 WS-VARIABE.

49 WS-VARIABLE-LENGTH S9(04) COMP.

49 WS-VARIABLE-TEXT X(255).

**002 DB2 DBMS explained**

**Q. What are the various locks available?**

ANS SHARE, EXCLUSIVE, UPDATE.

**003 DB2 Implementation**

**Q. What is the difference between CS and RR?**

**ANS**

CS- Releases lock on PAGE after use.

RR- Retains all locks obtained till end of transaction.

**Q. I use CS and update a PAGE. Will the lock be released after I am done with the PAGE?**

**ANS.**

No

**Q. What else is there in PLAN apart from the access path?**

ANS. PLAN has the executable code for the SQL statements in the HOST program.

**Q. What happens to the plan if the index used by it is dropped?**

ANS. PLAN is marked as invalid. The next time the plan is accessed it is rebound.

**Q. What are PACKAGES?**

ANS. They contain executable code for the SQL statements for one DBRM.

**Q. What are the advantages of using a package?**

ANS

1. Avoid having to bind a large number of DBRM members into a PLAN.
2. Avoid the cost of large binds.
3. Avoid the entire transaction being unavailable during bind and automatic rebind of the PLAN.
4. Minimize fallback complexities if changes result in an error.

**Q. What is a collection?**

ANS. A user defined name that is anchor for the packages. It has no physical existence. Main usage is grouping packages.

**Q. Will precompile the DB2 bomb if DB2 is down?**

ANS.

No. DB2 does not refer to DB2 catalogue Tables.

**Q. How is a typical DB2 batch program executed?**

Ans.

1. Use DSN utility to run a DB2 program from native TSO.

Eg:

DSN SYSTEM(DSP3)

RUN PROGRAM(COBDB2PGM) PLAN(COBDB2PGM) LOAD(‘XXXX.XX.LOADLIB’)

END.

1. Use IKJEFT01 utility to run above DSN command in JCL.

Note: generally plan and program names are given the same name.

**Q. What happens when you say OPEN CURSOR?**

ANS.

IF there is ORDER BY, rows are fetched, sorted and made available for the FETCH statement. Otherwise simply CURSOR is placed at the first row.

**Q. Is DECLARE CURSOR executable?**

ANS. No.

**004 DB2 SQL**

**Q. What are sqlcodes –803, -805, -811, -818, -904, -911, -913, -101, +100?**

ANS

-922: AUTHORIZATION FAILURE: error-type ERROR. REASON reason-code.  
**Suggestion:** Connection to DB2 has failed due authority for USER or PLAN. Contact DBA to check DB2 authorizations.

-551: auth-id DOES NOT HAVE THE PRIVILEGE TO PERFORM OPERATION operation ON OBJECT object-name.  
**Suggestion:** Contact the support DBA to GRANT the needed privilege.

-530: THE INSERT OR UPDATE VALUE OF FOREIGN KEY constraint-name IS INVALID.  
**Suggestion:** Ensure that INSERT row for DB2 PARENT table is completed before INSERT row in CHILD table

-803: INSERT or UPDATE operations are performed in constrained UNIQUE INDEX columns with certain unique values.

-805: An attempt to the application program that uses a DBRM or a package. The location-name, collection-id, DBRM-name, consistency-token are not found.

-811: An embedded select statement’s result is a table with more than one row or the result of subquery’s predicate is exceeding one value.

-818: Variation of consistency token in DBRM and the load modules are mismatching / different.

-904: UNSUCCESSFUL EXECUTION CAUSED BY AN UNAVAILABLE RESOURCE. REASON reason-code, TYPE OF RESOURCE resource-type, AND RESOURCE NAME resource-name.  
**Suggestion:** -904 is usually caused because a database utility job has started the desired DB2 object in utility mode. Check DB2 Master Log for more details on the resource name – contact DBA.

-911: The current transaction has been rolled out because of deadlock or time out.

-913: Execution is unsuccessful due to deadlock or timeout.

-101: Complicated or long SQL or long SQL query. Need to rephrase the query.

+100: Row was not found for a fetch. Update/delete/query is resulting in an empty table.

**Q. How do you pull up a query which was previously saved in QMF?**

**ANS.**

You can go to QMF menu & type  
**LIST QUERIES**  
it will give u all the query saved by ur TSO ID  
then Query which u want to edit against that press F4 it will open a command window.  
**RUN queryname**  
it will execute your query then press **F6.** Now you can edit your query.

**Q. When is the access path determined for Dynamic SQL?**

ANS. At run time, when PREPARE statement is issued.

**Q. What is SPUFI?**

ANS. SPUFI stands for SQL processing using file input. It is the DB2 interactive menu-driven tool used by developers to create database objects.

SPUFI: SQL Processing Using File Input, it supports the on-line execution of SQL statements from a TSO terminal

**Q. In SPUFI suppose you want to select max 1000 rows, but the select returns only 200 rows.**

**What are the two SQLCODES that are returned?**

ANS. 100(for successful completion of the query), 0(for successful COMMIT if AUTOCOMMIT is set to yes).

**Q. Assuming Plan and program are given same names what is the easiest way of finding effected programs when table structure is modified?**

ANS. Query the CATALOGUE tables SYSPLANDEP, SYSPACKDEP.

**Q. What is the use of VALUE function?**

**ANS.**

1. Avoid negative SQLCODES by handling nulls and zeroes during computation.
2. Substitute a numeric value for any null used in computations

**Q. What is restriction on using Union in Embedded SQL?**

**ANS.** It has to defined in Cursor.

**Q. What do you accomplish by GROUP BY and HAVING clause?**

**ANS.**

GROUP BY partitions the selected rows on distinct values of the columns on which GROUP BY is specified.

HAVING selects GROUPS matching the specified criteria.

**Q. What is the result of the query if no row is selected?**

**SELECT SUM(salary)**

**FROM emp**

**WHERE qual=”BE”.**

ANS. Null

**Q. Why SELECT \* is not preferred in embedded SQL?**

**ANS**

Three reasons

1. If there is any change in table structure, then the Application program needs to be modified.
2. Program might retrieve the columns which are not used, causing IO overhead.
3. The chance of index only search is lost.

**Q. What are correlated subqueries?**ANS.

The subquery in which inner (nested) query refers back to the table in the outer query. Correlated subqueries must be evaluated for each qualified row of the outer query that is referred to.

**Q. What are the issues related to Correlated subqueries?**

ANS.

**Q. Name some fields of SQLCA?**

ANS. SQLCODE, SQLERRM, SQLERRD

**Q. How can you quickly find no of rows updated after UPDATE statement?**

ANS.SQLERRD(3).

**Q. What is SQLCA?**

- SQLCA stands for SQL Communication Area.

- SQLCA is a structure of variables which are updated after every SQL statement’s execution.

- Exactly only one SQLCA need to be provided to an application that contains executable SQL statements.

- SQLCA is not applicable to JAVA application.

- More than one SQLCA need to be provided for FORTRAN application.

**Q. What is the max length of SQLCA?**

- The maximum length of SQLCA is 136.

**Q. What does SQLCABC has?**

- SQLCABC is one of the fields available in SQLCA.

- It is an INTEGER type.

- It contains the length of the SQLCA.

**Q. Is it possible to alter a table – for example adding a column, when another user is accessing or updating some columns?**

- It is possible to alter a table.

- The DB2 tables will not re-structure until any transaction is committed.

- A new column is defined and identified by the database.

- The new column will be included only after the transactions of the table are committed.

- All the altering table statements will be received from other users and are stored.

- The commit status is updated by the database engine and then the new columns are added.

**Q. How and when does the Db2 enforces the unique key?**

- DB2 utilizes unique index to avoid identical key values storage in database.

- A unique index must be created whenever a table is to be created with primary key.

- DB2 marks the table as unavailable until the needed indexes are created explicitly.

- DB2 prevents the duplicate entities into the table that has unique key.

- A unique key is declared by using the UNIQUE clause of CREATE TABLE command.

- DB2 enforces the unique index when INSERT, UPDATE statements are applied to the table.

- DB2 also enforces the unique index during the LOAD utility execution.

**005 DB2 Advanced**

**Q. What is QUIESCE?**

ANS. A QUIESCE flushes all DB2 buffers on the disk. This gives correct snapshot of the database and should be used before and after IMAGECOPY

**Q. What is clustering index?**

ANS. Causes the data rows to be stored in the order described in the index.

A mandatory index defined on partitioned table space.

**Q. Suppose I have a dynamic sql and has been performing well till now. Off late I found performance is deteriorated what might be the issue?**

ANS. Probably RUNSTATS is not done and the program is using wrong index due to incorrect stats.

Probably RUNSTATS is not done and optimizer is choosing wrong access path based on the statistics.

**Q. How does DB2 store null values physically?**

ANS. An extra byte prefix to the column value. The null prefix is X’00’ if the value is present and X’FF’ if no value is present.

**Q. When will you choose to use RUNSTATS?**

ANS. After LOAD, or after mass updates, inserts, deletes or after REORG.

The stats collected during RUNSTATS are

1. No of rows in a table
2. Percent of rows in clustering sequence
3. No of distinct values in indexed columns
4. No of rows moved to nearby or faraway page due to row length increase.

**Q. What is REORG when it is used?**

ANS. REORG reorganizes data on physical storage to recluster rows, positioning overflowed rows in their proper sequence, to reclaim space, to restore free space. It is used after heavy updates, inserts, deletes. After segments of segmented tablespace are fragmented.

**Q. When do you use IMAGECOPY?**

ANS. To take routine backup of tables

After LOAD with LOG NO.

After REORG with LOG NO.

.

**Q. What is COPY PENDING status?**

Ans. A state in which image copy of the table needs to be taken. In this status table is available only for queries, no updates are allowed. To remove COPY PENDING status either take IMAGECOPY or use the REPAIR utility.

**Q. What are the various locking levels available?**

ANS. PAGE, TABLE, TABLESPACE.

**Q. How DB2 determine which lock size to use?**

ANS.

1. Based on the lock-size given during creation of tablespace.
2. Programmer can direct the DB2 to which lock-size to use.
3. If lock-size ANY is specified, DB2 usually chooses the lock size as PAGE.

**Q. What is the disadvantage of using page level lock?**

ANS. High resource utilization if large updates are done.

**Q. What is lock escalation?**

ANS.

Promoting the PAGE lock size to TABLE or TABLESPACE when a transaction has acquired more locks than specified in NUMLKTS. Lock should be taken on objects in single TABLESPACE for escalation to occur.

**Q. What is ALTER?**

ANS. SQL command used to change the definition of the DB2 Objects.

**Q. Can I use LOCK TABLE on view?**

ANS. NO. To lock a view, we need lock underlying tables.

**Q. What is ACQUIRE/RELEASE in DB2 bind?**

ANS. Determines the point at which DB2 acquires or releases the locks against tables or tablespaces, including intent locks.

**Q. What is EXPLAIN?**

ANS.

EXPLAIN is used to display the access path determined by the optimizer for the SQL query. It can be used in SPUFI (for single SQL statement) or in BIND step for embedded SQL

Before you use EXPLAIN make sure to create PAN\_TABLE with your authid.

Output of EXPLAIN is stored in userid.PLAN\_TABLE.

**Q. EXPLAIN has output with MATCHCOLS=0. What does it mean?**

ANS. A non-matching index scan if ACCESSTYPE=I. higher the MATCHCOLS

Higher will be speed and cost savings.

**Q. How do you do the EXPLAIN of a dynamic SQL statement?**

ANS

1. Use SPUFI or QMF to EXPLAIN the dynamic SQL.
2. Include EXPLAIN command in the embedded dynamic SQL.

**Q. How do you simulate the EXPLAIN of the embedded SQL in SPUFI/QMF?**

ANS.

SELECT empname

FROM emp

WHERE emp\_salary=?

**Q. What is QMF Batch?**

**ANS.**

IBMS Query Management Facility is an interactive tool used to produce formatted query o/p.

You can use three QMF objects to produce formatted o/p

1. F6 – Query
2. F9 – Form
3. F10 – Proc

Press fetch the QMF Query Panel, type your query and press F2. A report will be prepared. For print press F4. For formatting the report press F9. You can modify report parameters and headings as needed. Press F12 to see final formatted reports

A QMF query can contain only one SQL statement. This is in contrast to that of SPUFI, which can contain multiple SQL statements.

To execute multiple SQL statements you can use QMF Proc. QMF Proc contains QMF commands that are tied together and execute serially.

<https://www.ibm.com/support/knowledgecenter/SS9UMF_12.2.0/igm/igm/tpc/dsq_batch_run_notcics_overview.html>

**Q. What is DB2 Case?**

**ANS.**

A Case expression allows you to select an expression based on evaluation of one or more conditions. In other words, it allows you to add the if-else logic to your queries.

Db2 supports two kinds of Case expressions: simple Case and Searched Case expressions.

Both simple and searched CASE are expressions, therefore, you can use them in any clause that accepts an expression such as **SELECT, WHERE, GROUP BY, and HAVING clauses.**

Simple CASE expression

The following shows the syntax of the simple CASE expression:

CASE expression

WHEN expression\_1 THEN result\_1

WHEN expression\_2 THEN result\_2

...

WHEN expression\_n THEN result\_n

[ ELSE else\_result ]

END

In this syntax, Db2 compares the expression in the CASE clause with each expression (expression\_1, expression\_2, …) in the WHEN clause sequentially from top to bottom.

Db2 returns the corresponding result in the THEN clause (result\_1, result\_2, …) if it finds a match (expression = expression1, expression = expression2…). Db2 immediately stops searching once it finds a match.

If Db2 does not find any match, it will return the else\_result in case the ELSE clause is available. If you don’t specify the ELSE clause, the simple CASE expression will return NULL when it finds no match.

Simple CASE expression example

The following example returns the book title, the number of authors of each book, and a note:

SELECT

b.title,

COUNT(a.author\_id) author\_count,

CASE COUNT(a.author\_id)

WHEN 1 THEN 'Single Author'

WHEN 2 THEN 'Two Authors'

ELSE 'More Than Two Authors'

END note

FROM books b

INNER JOIN book\_authors a

ON a.book\_id = b.book\_id

GROUP BY b.title

ORDER BY b.title;

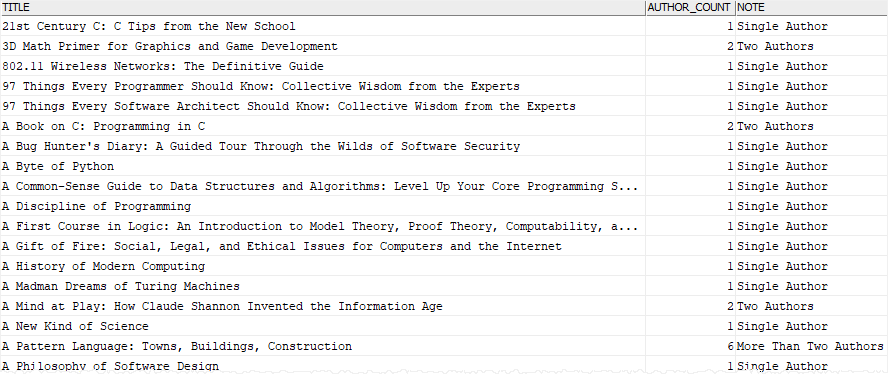
Here is the partial output:

In this example, we used the simple CASE expression to make the note columm with the following logic:

• If a book has one author, the CASE expression returns 'Single Author'.

• If a book has two authors, the CASE expression returns 'Two Authors'.

• If a book has more than 2 authors, the CASE expression returns 'More Than Two Authors' specified in the ELSE clause.



**Searched CASE expression**

The syntax of the searched CASE expression is the following:

CASE

WHEN expression\_1 THEN result\_1

WHEN expression\_2 THEN result\_2

...

WHEN expression\_n THEN result\_n

[ ELSE else\_result ]

END

In this syntax:

• expression\_1, expression\_2, are Boolean expressions.

• result\_1, result\_2, … are possible results.

The searched CASE expression evaluates expression\_1, expression\_2… sequentially in each WHEN clause in the specified order until an expression evaluates to true. Then, the CASE expression returns the corresponding result and stops searching.

If no expression evaluates to true, the searched CASE expression returns the result in the ELSE clause or NULL if you don’t specify the ELSE clause.

Searched CASE expression example

The following example uses the searched CASE expression to return the comments based on the book ratings:

SELECT

title,

rating,

CASE

WHEN (rating >= 1 AND rating < 2) THEN 'Not so good'

WHEN (rating >= 2 AND rating < 3) THEN 'Limited useful information'

WHEN (rating >= 3 AND rating < 4) THEN 'Good book, but nothing special'

WHEN (rating >= 4 AND rating < 5) THEN 'Incredbly special'

WHEN rating = 5 THEN 'Life changing. Must Read.'

ELSE

'No rating yet'

END AS comment

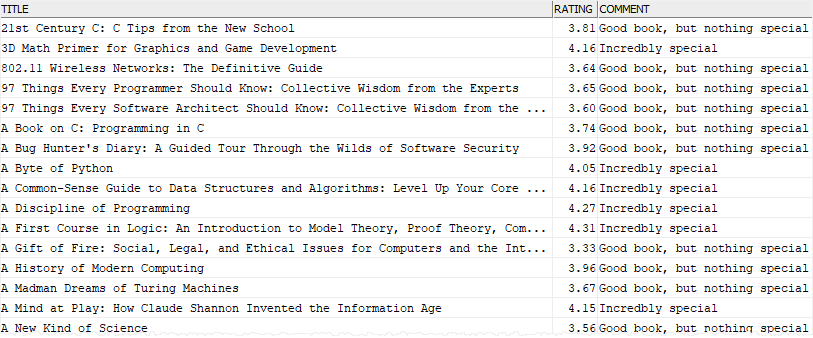
FROM

books

ORDER BY

title;

Here is the partial result set:



In this tutorial, you have learned how to use the Db2 CASE expression to add if-else logic to the queries

**Q. What is DB2 Switch Statements?**

ANS

**Q.** [How to use case in db2 column select query](https://stackoverflow.com/questions/25546567/how-to-use-case-in-db2-column-select-query)

**ANS**

select

case

when someid = 1 then date\_1

when someid = 2 then date\_2

when someid = 3 then date\_3

when someid = 4 then date\_4

end **as col1**

,case

when someid = 1 then xdate\_1

when someid = 2 then xdate\_2

when someid = 3 then xdate\_3

when someid = 4 then xdate\_4

end **as col2**

from mytable;

**Q. How to execute stored procedures?**

The following is the process to execute the stored procedures:

- From the command line type

db2 connect to Sample;

db2 -td@ -vf createSQLproc.db2

- Type the entire script. After completion of entering the script save the script

- Execute the script by invoking the CALL command from Command editor:

CALL Sample;

**Q. What is CHECK constraint. Explain with example.**

- A CHECK constraint is one of the constraints to ensure data integrity

- CHECK constraint is specified as a condition / criteria

- The value that is to be inserted or updated in a table, need to be tested by the CHECK constraint

- If the value is meeting the criteria, then the data is inserted or updated in the designated column of a table

- CHECK constraint is used at the time of creation of a table

- The following example illustrates the use of CHECK constraint:

CREATE TABLE PRODUCT (PROD\_ID INTEGER NOT NULL,

QUANTITY INTEGER CHECK (QUANTITY >= 1)

**Q. What are the advantages of using a PACKAGE?**

- Packages are the alternative to creating procedures and functions.

- They are stand-alone schema objects.

The advantages of packages are:

1. Modularity:

All the procedures and functions belong to a particular module of an application can be encapsulated in a package.

2. Easy to design the application:

The package body and package specification can be coded and compiled separately without its body. Stored procedures are compiled and executed by qualifying the package names.

3. Hiding Information:

The programming elements declared in the specification of the package is public. The package body elements are declared as private, i.e., they are invisible to the application. Hence they are secured.

4. Added Functionality:

Public variables and cursors are persisted for a session, which enables the sharing of data by all programs of the calling environment.

5. Better Performance:

Packaged sub programs are invoked for the first time by loading the entire package into the memory. Disk I/O operations are not needed for calling related sub programs in the package later.

6. Overloading:

Multiple programs can be placed in the same package with different number of parameters or types or parameters.

**Q. What is DBRM? What it contains? When it will be created?**

- DBRM stands for Database Request Module.

- The output of pre-compile process is represented as DBRM.

- The SQL statements are extracted from the host language by the pre-compiler.

**Q. What it contains?**

- It contains executable host SQL statements.

- During the pre-compilation process, the SQL code is embedded in the COBOL and will be extracted and moved into DBRM.

**Q. When it will be created?**

- The DBRM is created after pre-compilation of SQL statements.

**Q. What do you mean by NOT NULL WITH DEFAULT? When will you use it?**

- NOT NULL WITH DEFAULT is a clause of CREATE INDEX.

- It is ensured that the uniqueness of the key column, that is defined with index. But allows the NULL values in the column.

- It indicates that the column could not contain a NULL, when a user does not enter any value. DB2 generates the default value.

- It ensures that no null values are persisted.

- NOT NULL WITH DEFAULT is used when there must be a value in the columns. For example, every product should have product name, every employee should have employee name.

**Q. What is COPY PENDING status?**

- A status occurs when image copy on a table needs to be taken.

- The table is available only for queries and can not be updated.

- COPY PENDING status can be removed by taking away the image copy or by using REPAIR utility.

**Q. What is REORG? When is it used?**

- Data reorganization on physical storage is done by REORG.

- It is used for reclaiming the space by restoring the free space.

- Rows can be clustered using REORG.

- The overblown rows can be positioned in their proper sequence.

- REORG is advantageous to be used after heavy updates, inserts and delete operations.

- Useful followed by segments of a segmented table spaces.

How is a typical DB2 batch program executed?

- **DSN utility** can be used to run a DB2 batch program from native TSO.

- The following example illustrates the execution of a batch program in DB2:

DSN SYSTEM (DSP3)

RUN PROGRAM (EDD470BD) PLAN (EDD470BD) LIB ('ED01T.OBJ.LOADLIB')

END

- **To run the DSN command in JCL, use IKJEFT01 utility program.**

Is DECLARE TABLE in DCLGEN necessary? Why it used?

- Declaration of table in DCLGEN is not necessary.

- DECLARE TABLE in DCLGEN is necessary to validate the table-name, view-name, column-name … during pre-compilation by the pre-compiler.

**Q. How do you leave the cursor open after issuing a COMMIT? (For DB2 2.3 or above only)**

- Cursor can be left open after issuing a COMMIT.

- By using WITH HOLD option in the DECLARE CURSOR statement.

- The pseudo-conversational CICS programs will not be effected.

**Q. What does it mean if the null indicator has -1,0,2?**

- -1 indicates the field is null.

- 0 indicates the field is not null.

- 2 indicates the field is truncated.

**Q. What is the difference between Cursor Stability and Repeatable Read isolation levels?**

CURSOR STABILITY:

- CS is a row level locking.

- Acquires an exclusive lock on the row that is to be updated.

- When the control is moved to the next updatable row, the lock is released.

REPEATABLE READ:

- RR is a page level locking.

- Acquires an exclusive lock on the entire page which is the source of row availability.

- When the control is moved to the next updatable page the lock is released.

**Q. What is the difference between SPUFI and QMF?**

SPUFI:

- Several queries can be executed at once.

- The result of the query will be stored in PS or in PDS member.

- SQL Code is known after the executing the query.

- SPUFI is a quick and dirty SQL execution engine.

QMF:

- More than one query can not be executed.

- The result of the query can not be persisted.

- SQL Code of the query can not be known.

- QMF is a query or reporting environment and supports formatting of reports.

**Q. Displaying error message from SQLCODE.**

ANS.

Declare below variables in working storage section

EXEC SQL

INCLUDE SQLCA.

END-EXEC

77 SQLCODE PIC S9(3).

01 ERR-MSG.

02 ERR-LEN PIC S9(04) COMP

02 ERR-CONTENT PIC X(80).

01 ERR-LRECL PIC S9(9) COMP VALUE 80.

To populate or get the error description we pass SQLCODE to DSNTIAR pgm

CALL ‘DSNTIAR’ USING SQLCA, ERR-MSG, ERR-LRECL

DISPLAY ERR-MSG

**Q. Permissions that can be granted in DB2.**

**ANS.**

**DBADM**          Database administrator authority

**DBCTRL**         Database control authority

**DBMAINT**       Database maintenance authority

**CREATETS**     Create Table space Authority

**CREATETAB**  Create Table authority

**DROP**              Drop authority on a database or subordinate objects

Q1)      What RDMS objects are created with the SQL CREATE statements?

A1)      The SQL CREATE statements are used to create the following objects:

            STOGROUP                A storage group

            DATABASE                A logical collection of tables

            TABLESPACE An area that stores tables

            TABLE                        A data structure organized by a specified columns

            INDEX                        An alternate path to a table data

            VIEW                          An alternate representation of one or more tables

            SYNONYM                 An alternate name for local table or view

            ALIAS                         An alternate name for a table definition which may be local   or remote, existence or nonexistent

Q2)      What RDMS objects are required before you can create a table?

A2)      Before you can create a table, you need an existing database and tablespace.

Q3)      In what RDMS object does one first list column names?

A3)      One first uses the column name in the CREATE TABLE statement.

Q4)      What is the syntax for a CREATE TABLE statement?

A4)      CREATE TABLE table name

                        (column name list

                        primary key (column name))

                        in database-name, tablespace-name.

Q5)      Can one add columns to a table after it has been defined?

A5)      Yes, one can add column to a table after it has been defined by using the SQL ALTER TABLE statement.

Q6)      Where in a table are added columns located?

A6)      The new columns are added to the end of the table.

Q7)      After a table is defined, can columns be removed?

A7)      The only way to remove columns from an existing table involves a migration program that extracts only the desired

columns of data, redefining the table without the unwanted columns, then populating the new table. One have to handle

all the old table’s dependents programmatically.

Q8)      Which RDMS objects can you change with the SQL ALTER statements?

A8)      The SQL ALTER statement can change a table index, a table, a tablespace, or a STOGROUP.

Q9)      What authority is required to create a table?

A9)      In order to create tables, one needs CREATETAB privileges.

Q10) What is minimum authority required for one to create a tablespace?

A10) In order to create tablespaces, one needs CREATETS privileges.

Q. What are the parts of SELECT statement?

ANS.

**FROM** specifies which table to get the data.

**WHERE** specifies which rows to retrieve.

**GROUP BY** groups rows sharing a property so that an aggregate function can be applied to each group.

**HAVING** selects among the groups defined by the GROUP BY clause.

**ORDER BY** specifies an order in which to return the rows.

AS provides an alias which can be used to temporarily rename tables or columns.

Q11) When is it necessary to create a table index?

A11) It is necessary to create a table index whenever you want to enforce the uniqueness of the table’s primary key.

**Q. What is a synonym?**

A12) A synonym is an unqualified alternative name for a table or view.

**Q. Are view updatable?**

- Certain views are updateable.

- A single table view can be updatable.

- Views with joins, aggregate functions, having GROUP BY clause are non-updateable views.

**Q. What is a foreign key?**

**ANS.** A foreign key is the key defined in one table to reference the primary key of a reference table. This foreign key must

have the same structure as the reference table’s primary key.

Q.  What is referential integrity?

ANS. Referential integrity is the automatic enforcement of referential constraints that exist between a reference table and a

referencing table. When referential integrity is enforced, the value of a foreign key exists as a primary key value in the

reference table. In other words, when referential integrity is enforced, all of the foreign key values in, for example, the

“department code” column in an “employee” table exist as primary key values in a “department” table.

**Q.  What are the column name qualifiers?**

ANS.  A column name qualifier are used as a table designator to avoid ambiguity when the column names referenced exists

in more than one table used in the SQL statement. Column name qualifiers are also used in correlated references.

Q16) What is a correlation name?

A16) A correlation name is a special type of column designator that connects specific columns in the various levels of a

multilevel SQL query.

Q17) What is a results table?

A17) A result table is the product of a query against one or more tables or views (i.e., it is the place that holds the results of a

query).

Q18) What is a cursor?

A18) A cursor is a named control structure used to make a set of rows available to a program. DB2 is the relational database

system that runs in an MVS environment. It was developed by IBM and interfaces with SQL. With the use of SQL

DB2, databases can be accessed by a wide range of host languages. SQL is the relational database " application

language " that interfaces with DB2. Because of its capabilities, SQL and, in turn, DB2 have gained considerable

acceptance. Thus, a working knowledge of DB2 increases one's marketability.

Q19)   What is the basic difference between a join and a union?

A19)       A join selects columns from 2 or more tables. A union selects rows.

Q20)   What is normalization and what are the five normal forms?

A20)   Normalization is a design procedure for representing data in tabular format.  The five normal forms are progressive

rules to represent the data with minimal redundancy.

Q21)   What are foreign keys?

A21)   These are attributes of one table that have matching values in a primary key in another table, allowing for relationships

between tables.

Q22)   Describe the elements of the SELECT query syntax?

A22)   SELECT element FROM table WHERE conditional statement.

Q23)   Explain the use of the WHERE clause?

A23)   WHERE is used with a relational statement to isolate the object element or row.

Q24)   What techniques are used to retrieve data from more than one table in a single SQL statement?

A24)   Joins, unions and nested selects are used to retrieve data.

Q25)   What is a view? Why use it?

A25)   A view is a virtual table made up of data from base tables and other views, but not stored separately.

Q26)   Explain an outer join?

A26)   An outer join includes rows from tables when there are no matching values in the tables.

Q27)   What is a subselect?  Is it different from a nested select?

A27)   A subselect is a select which works in conjunction with another select.

A nested select is a kind of subselect where the inner select passes to the where criteria for the outer select.

Q28)   What is the difference between group by and order by?

A28)   Group by controls the presentation of the rows, order by controls the presentation of the columns  for the results of the

SELECT statement.

Q29)   What keyword does an SQL SELECT statement use for a string search?

A29)   The LIKE keyword allows for string searches.  The % sign is used as a wildcard.

Q30)   What are some SQL aggregates and other built-in functions?

A30)   The common aggregate, built-in functions are AVG, SUM, MIN, MAX, COUNT and DISTINCT.

Q290)     When one binds a PACKAGE (of a plan) what package information is stored and where it is stored?

A290)     The access path information for the PACKAGE is stored as skeleton package tables in the SPT01 table.

Q291)     Where besides the DB2 catalog is database object information stored by DB2?

A291)     DB2 also stores information about DB2 objects as database descriptors (DBDs) in the DBD Directory table.

Q292)     Can you access the DB2 Directory table using SQL?

A292)     No. These tables are exclusively accessed by internal DB2 processes.

DB2 Commands

Q293)     Which DB2 command is used to retrieve environmental information?

A293)     The DISPLAY command can return the following environmental  data: DATABASE info, RLIMIT info, THREAD info, TRACE info, and UTILITY info.

Q294)     Which command is issued to establish the Boot Strap Data Set after an I/O failure?

A294)     The DBA would issue a RECOVER BSDS command.

Q295)     How is the status of a utility reset after it has been stopped by DB2 ?

A295)     By issuing the START RLIMIT command.

Q296)     How can one determine the status of a tablespace?

A296)     By using the DISPLAY DATABASE command.

**Q. The following is the checklist  to complete a DB2 batch or on-line program....**

**ANS.**

***Batch DB2 COBOL program....***

1. If the program is main program it should have both DBB and DPK components.

2. If the program is linked (called) program it should have only DPK component. But the package generated should be binded in Calling program DBB component.

**For example the DBB component looks like ....**

  BIND PLAN(????????)   -        \*\*\*\*\*\*\*\*\*\*>>>    ENTER PLAN NAME

  PKLIST(SEALAND.????????, -    \*\*\*\*\*\*\*\*\*\*>>>    ENTER MEMBER NAME

         SEALAND.????????, -    \*\*\*\*\*\*\*\*\*\*>>>     (MULTIPLE MEMBERS

         SEALAND.????????) -    \*\*\*\*\*\*\*\*\*\*>>>      FOR EACH PLAN)

   QUALIFIER(TEST)    -         \*\*\*\*\*\*\*\*\*\*>>>    MUST ALWAYS BE TEST

   OWNER(????)        -         \*\*\*\*\*\*\*\*\*\*>>>    ENTER YOUR TSO ID

   ACTION(REPLACE)    -

   RETAIN             -

   VALIDATE(BIND)     -

   ISOLATION(CS)      -

   FLAG(I)            -

   ACQUIRE(USE)       -

   RELEASE(COMMIT)    -

   EXPLAIN(YES)

**The following is the format of the DPK card....**

  BIND PACKAGE(SEALAND) -

 MEMBER(????????)     -        \*\*\*\*\*\*\*\*\*\*\*>>>    ENTER MEMBER NAME

 VALIDATE(BIND)       -

 OWNER(????)          -        \*\*\*\*\*\*\*\*\*\*\*>>>    ENTER YOUR TSO ID

 EXPLAIN(NO)          -

 QUALIFIER(TEST)               \*\*\*\*\*\*\*\*\*\*\*>>>    MUST ALWAYS BE TEST

3. As we are all aware that RCT is a concept of CICS. So batch DB2 program will not have any RCT entry.

4. To run this DB2 program the following is the model JCL...

//TESTXXX  JOB  (AAAA),'ACCOUNTS PAYABLE',CLASS=A,

//   USER=XXXX,MSGCLASS=H,REGION=4096K

/\*JOBPARM SYSAFF=B158

//JOBLIB    DD DSN=TEST.JOBLIB,DISP=SHR

/\*

//STEP010   EXEC PGM=IKJEFT01,DYNAMNBR=20

//STEPLIB   DD DSN=DB2T.DSNEXIT,DISP=SHR

//          DD DSN=DB2T.DSNLOAD,DISP=SHR

//          DD DSN=TEST.JOBLIB,DISP=SHR

//INPUT1    DD DSN=XYZ.ABC.DBF,DISP=SHR

//OUTPUT1   DD DSN=XYZ.BCD.LEY,

//             DISP=(NEW,CATLG,DELETE),

//             DCB=(RECFM=FB,LRECL=122,BLKSIZE=2440),UNIT=SYSDA,

//             SPACE=(CYL,(10,2),RLSE)

//SYSPRINT  DD SYSOUT=\*

//SYSTSPRT  DD SYSOUT=\*

//SYSOUT    DD SYSOUT=\*

//SYSERR    DD SYSOUT=\*

//SYSDUMP   DD SYSOUT=\*

//TESTDUMP  DD SYSOUT=\*

//SYSMSG    DD SYSOUT=\*

//SYSTSIN   DD \*

DSN SYSTEM(DB2T)

RUN PROG(TESTPROG) PLAN(TESTPLAN)

END

//\*

As shown in above JCL program IKJEFT01 is used to run DB2 program (TESTPROG in our example).

In the above JCL program name and plan names are specified in SYSTSIN dataset as in-stream data.

**The following is the check list to complete CICS(on-line) DB2 program...**

1. If the program is main program it should have both DBB and DPK components.

2. If the program is LINKed, XCTLed program it should have only DPK component. But the package generated

should be binded in Calling program DBB component.

3. RCT entry has to be created if the program is main program(which consists of TRANSID). If the program is

LINKed or XCTLed it need not have a RCT entry. RCT entry basically used to attach CICS system to DB2syst em.

4. No JCL business here because it is on-line.

5.   The DBB and DPK s shown for batch program are also applicable to this.

DB2 Interview Questions

siteS

<http://www.mainframetutorials.com/DB2.html>

<http://www.mainframegurukul.com/srcsinc/DB2.html>

<http://www.aired.in/2010/01/db2-interview-questions-and-answers.html>

<http://mainframewizard.com/content/db2-interview-questions>

<http://www.mainframes360.com/2010/09/cobol-interview-questions.html>

<https://sites.google.com/site/indusitfactory/db2-dba-interview-questions>

<http://www.sql-tutorial.net/SQL-JOIN.asp>

<http://www.geekinterview.com/Interview-Questions/Mainframe/DB2>

<http://www.allinterview.com/Interview-Questions/DB2.html>

[**http://www.aired.in/2009/11/db2-interview-questions-asked-in-top.html**](http://www.aired.in/2009/11/db2-interview-questions-asked-in-top.html)

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**IMPORTANT Points**

**Interview with NESS (Pramod) HR – Ranjitha For Education Domain Project**

**Q.What is restore command for DB2**

**Q.What are the utilities used in DB2 for DB maintainance like copy,Backup etc.. and how to use it**

**Q. What is Huge command in DB2**

**Q. Explain about Normalisation techniques in detail**

**Q. Can I delete parent table without deleting Child table**

**Q. What are Data Pages explain in detail**

**Q.Explain the use of Buffer pool**

**Q.What are different types of Triggers in DB2**

**Q. Explain aggregate functions used in Db2**

**Q.Can we use aggregate functions in where clause and having clause**

**Q. How can we handle if the stored procedure returns multilple results**

**Q. What are different Indexes used in DB2**

**Q. What is Cluster index.**

**Q.Explain about how u use Free command in DB2**

**Q.Explain about Lock in detail**

**Q. What is the difference b/w truncate and delete**

Questions and their Explanation

Q.How would you find out the total number of rows in a DB2 table?

ANS.Use SELECT COUNT(\*) ... in db2 query

Q.How do you eliminate duplicate values in DB2 SELECT ?

ANS.Use SELECT DISTINCT ... in db2 query

Q.How do you select a row using indexes in DB2?

ANS.Specify the indexed columns in the WHERE clause of db2 query.

Q.How do you find the maximum value in a column in db2?

ANS.Use SELECT MAX(...) .. in db2 query

Q.How do you retrieve the first 5 characters of FIRSTNAME column of DB2 table EMP

ANS.SQL Query : SELECT SUBSTR(FIRSTNAME,1,5) FROM EMP;

Q.What do you mean by foreign keys?

Ans:- Foreign keys are column or combination of columns in a table that have matching value in primary key of another table, thus maintaining relationships between tables.

Q.What is normalization?

Ans:- Normalization is a procedure for reducing redundancy of data and representing data in tabular format.

Q.What is a data page?

Ans:-A data page is a unit of data which can be retrieved. It could be either 4K or 32K (depending on the way table is defined).

**Q.What is meant by DB2 bind?**

ANS:- A DB2 bind is a process that builds an access path of the application to the relational database i.e. DB2 tables.

DB2 bind process does the following

**Validates** :-Sql statements are validated for valid tables, view and column names. Syntax errors are checked so that these can be corrected.

**Verifies** :- Bind process verifies that the user or the process is authorized to bind the plan.

**Selects** :-Selects the access path from the application program to the DB2 objects.

OR

DB2 bind is a process that builds an access path to DB2 tables

**Q.What is DB2 access path?**

Ans:- An access path is the method used to access relational data specified in DB2 SQL statements.

**Q.What is a DB2 plan?**

Ans:-A **DB2 plan is an executable code containing the access path logic** produced by the DB2 bind process

This could consist of

One or more DBRM or

One or more packages or

Combination of DBRM and packages

OR

An application plan or package is generated by the bind to define an access path.

**Q.What is tablespace and these are of how many types?**

Ans:- Tablespaces are like containers for storing the tables. Tables are not physical objects while tablespaces are physical objects. There are three types of tablespaces: simple, segmented and partitioned.

Q.What is cursor stability?

Ans:-Cursor stability is a type of isolation level which makes sure that the data read by an application program is locked only while its used, as soon as the cursor moves away to another page of data the lock on the previous page is released so that other programs can access the data for updation. This form of isolation level is high on concurrency but low on integrity of data.

Q.How to fetch data from more than one table in a single SQL statement?

Ans:-For this we can use Joins,unions or nested selects.

Q.Define view and Why it is used?

Ans:- A view is a virtual table containing data from one or more tables, but this data is not stored in a separate spaces.

Q.What is UNION,UNION ALL?

ANS.

UNION : eliminates duplicates

UNION ALL: retains duplicates

Both these are used to combine the results of different SELECT

statements.

Suppose I have five SQL SELECT statements connected by UNION/UNION ALL, how

many times should I specify UNION to eliminate the duplicate rows?

Once.

EG:-

Select col1, col2, col3

from table

union

select cola, colb, colc

from table

col1 and cola, col2 and colb, col3 and colc must be same datatype

Q. Nested Selects

ANS.http://www.sql-tutorial.net/SQL-JOIN.asp

SELECT Customers.FirstName, Customers.LastName, SUM(Sales.SaleAmount) AS SalesPerCustomer

FROM Customers, Sales

WHERE Customers.CustomerID = Sales.CustomerID

GROUP BY Customers.FirstName, Customers.LastName

Q.SQL Joins

ANS.http://www.sql-tutorial.net/SQL-JOIN.asp

SELECT Customers.FirstName, Customers.LastName, SUM(Sales.SaleAmount) AS SalesPerCustomer

FROM Customers JOIN Sales

ON Customers.CustomerID = Sales.CustomerID

GROUP BY Customers.FirstName, Customers.LastName

**Q. What is QUIESCE?**  
A. QUIESCE flushes all DB2 buffers on to the disk This gives a correct snapshot of the database and should be used before and after any IMAGECOPY to maintain consistency

**Q. What is a Cluster Index ?**Causes the data rows to be stored in the order specified in the index A mandatory index defined on a partitioned table space  
  
**Q. How many clustering indexes can be defined for a table?**: ONLY ONE

**Q. What is the difference between Primary Key & Unique index ?**   
Primary : a relational database constraint Primary key consists of one or more columns that uniquely identify a row in the table For a normalized relation, there is one designated primary key Unique index: a physical object that stores only uniue values There can be one or more unique indexes on a table

**Q. What is SQLCODE -922 ?**Authorization failure

**Q. What is SQL-811?**SELECT statement has resulted in retrieval of more than one row

**Q. What does the SQLCODE -818 pertain to?**This is generated when the consistency tokens in the DBRM and the load module are different

**Q. What is normalization and what are the five normal forms?**Normalization is a design procedure for representing data in tabular format The five normal forms are progressive rules to represent the data with minimal redundancy.

**Q) What are aggregate functions?**

**Ans.Bulit-in mathematical functions for use in SELECT clause.**

**7) Can you use MAX on a CHAR column?**

YES