**SQL Assignment 4**

1. Explain different types of views. Demonstrate with suitable examples.

* **Views are a data base objects. Created via SQL queries. Views do not utilize/require memory as they are a result set of a stored query.**
* **Views can be of types: updatable views, query-able views (or read only views) and materialized views.**
* **To create updatable views the SELECT statement that defines the view must not contain Aggregate functions, distinct , groupby , having, left joins , outer joins , sub-queries in select clause or in where clause that refers the table in the from clause, reference to non-updatable view/s in the from clause and multiple references to any column in the base table.**
* **Query-able/read only views are ones where no DML operations can be performed.**
* **Materialized views are the pre-calculated (materialized) result of a query. Unlike a simple VIEW the result of a Materialized View is stored somewhere, generally in a table.**

1. What is the difference between function and stored procedure? Write syntax for creating functions and stored procedures.

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| **FUNCTIONS** | **STORED PROCEDURES** |
| **Functions can be called from a Select statement.** | **Stored procedures cannot be called from a Select/Where or Having statements. Execute statement must be used** |
| **Only Select statements. DML statements like update & insert are not allowed.** | **Can perform any operation on database objects including select and DML statements.** |
| **Allows only input parameters. Does not allow output parameters.** | **Allows both input and output parameters.** |
| **Cannot call a stored procedure from a function.** | **Can call a function from a stored procedure.** |
| **Always returns a single value; either scalar or a table.** | **Can return zero, single or multiple values.** |
| **Functions are compiled and executed at run time.** | **Stored procedures are stored in parsed and compiled state in the database.** |
| **Functions can be used in JOIN clauses.** | **Stored procedures cannot be used in JOIN clauses.** |

1. What is an index in SQL? What are the different types of indexes in SQL?

* **Indexing is the operation in SQL which is primarily used in data fetch/extraction operations, Indexing reduces the I/O (input/output) cost. Making the search operation efficient. Index can be understood as a database object which makes data retrieval faster.**

**Types of indexes: primary index, secondary index and clustered index.**

**Primary index is used when the data is ordered and has a key column (a unique column).**

**Secondary index is used when the data is unordered and does/doesn’t have a key column.**

**Clustered index is used when the data is ordered but has no key column.**