

Assignment 1: Introduction to SQL Server Assignment

1. Install MS SQL Server

Answer: To install MS SQL Server, follow the below steps

1. Search for SQL Server 2022
2. Go to Microsoft Web sit - [SQL Server Downloads | Microsoft](#)
3. Chose the Developer Edition and download the executable
4. Follow the wizard steps till the Database Engin configuration
5. Chose the mix mode for SQL server Authentication & put the password for **sa** login (sa is default user)
6. Complete the server installation
7. Download the SQL Server Management Studio (SSMS)
8. Install the management studio by flowing the wizard

2. Give the difference between Char and Varchar data type.

Answer:

CHAR	VARCHAR
CHAR datatype is used to store character strings of fixed length	VARCHAR datatype is used to store character strings of variable length
In CHAR, If the length of the string is less than set or fixed-length then it is padded with extra memory space.	In VARCHAR, If the length of the string is less than the set or fixed-length then it will store as it is without padded with extra memory spaces.
CHAR stands for "Character"	VARCHAR stands for "Variable Character"
Storage size of CHAR datatypes is equal to n bytes i.e., set length	The storage size of the VARCHAR datatype is equal to the actual length of the entered string in bytes.
We should use the CHAR datatype when we expect the data values in a column are of the same length.	We should use the VARCHAR datatype when we expect the data values in a column are of variable length.
CHAR takes 1 byte for each character	VARCHAR takes 1 byte for each character and some extra bytes for holding length information
Better performance than VARCHAR	Performance is not good as compared to CHAR

3. Explain the types of SQL Commands.

Answer: SQL commands are instructions, coded into SQL statements, which are used to communicate with the database to perform specific tasks, work, functions, and queries with data in the database.

There are 3 main types of commands.

DDL (Data Definition Language) commands, DML (Data Manipulation Language) commands, and DCL (Data Control Language) commands.

1. DDL (Data Definition Language)

Commands that can be used to define the database schema. These commands are used for creating, modifying, and dropping the structure of database objects. The database automatically commits the current transaction before and after every DDL Command. Some DDL commands are CREATE, ALTER, and DROP.

- **CREATE:** It is used to create the database and its objects (like tables, functions, views, indexes, procedures, triggers).

```
CREATE DATABASE database_name;
```

--This query will create a new database in SQL and name the database as the provided name.

```
CREATE TABLE Employees {  
  Emp_Id int(3),  
  Emp_Name varchar(20)  
};
```

--This will create a table Employees with column Emp_Id which stores integer data of length 3 and Emp_Name which stores string data of length 20.

- **ALTER:** Alter command is used to modify the existing database objects. It can add, delete/drop or modify columns in the existing table. It can also be used to add and drop various constraints on the existing table.

```
ALTER TABLE Employees ADD Salary DOUBLE(8,2);
```

--This query will add a column salary to the existing table Employees. If the table Employees do not exist, an error will be generated.

- **DROP:** DROP command is used to delete the various existing database objects. It deletes an entire database, an entire table, a view of a table or other objects in the database. If you **drop** a table, all the rows in the table are deleted and the table structure is removed from the database. Once a table is **dropped**, we cannot get it back.

DROP DATABASE Company;

--The database Company is deleted from the relational database management system.

DROP TABLE Employees;

--This SQL command will remove the table structure along with its data from the database.

2. DML (Data Manipulation Language)

The Data Manipulation Language allows to manipulate the information. You can Select (View the data), insert data, Update data, Delete data.

SELECT emp_name **FROM** employee **WHERE** age > 20;

-- Select the employee names whose age is greater then 20 years

Insert into dbo.sales **values**(1, 'HP Product',3,1233)

-- Insert the data into Sales table

UPDATE dbo.sales **SET** Description='HP Product v2'

Where Description ='HP Product'

-- Update the sales description where Description is 'HP Product'

DELETE FROM dbo.sales **Where** ID=11

--Delete the sales data based on ID

3. DCL (Data Control Language)

The Data Control Language contains SQL commands used to handle the security. For example, the employees' salaries are confidential information and may not be visible to all the employees. Just to some administrative levels and some HR members. The main commands are the GRANT, REVOKE and DENY commands

GRANT SELECT ON dbo.sales **TO** [crop\sales];

-- The Grant command allows to grant permissions to an object.

REVOKE EXECUTE ON dbo.listCustomers **to** corp\dhiren

--The revoke statement allows to revoke permissions to database objects.

DENY UPDATE ON dbo.users **to** managers

--The DENY sentence allows to deny permissions to certain objects. The main difference between a Revoke and a Deny permission is that the revoke undoes permission while a deny blocks the access to that permission

4. Explain NVarchar and Nchar.

Answer: **nchar** and **nvarchar** can store **Unicode** characters.

nchar and nvarchar will take up twice as much storage space, so it may be wise to use them only if you need *Unicode* support.

nvarchar [(n | max)] (national character varying.)

- Variable-length **Unicode** string data.
- n defines the string length and can be a value from 1 through 4,000.
- max indicates that the maximum storage size is $2^{31}-1$ bytes (2 GB).
- The storage size, in bytes, is two times the actual length of data entered + 2 byt

nchar[(n)] (national character)

- Fixed-length **Unicode** string data.
- n defines the string length and must be a value from 1 through 4,000.
- The storage size is two times n bytes.