

# Learn SQL Server in 1 Day

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# Table Of Content

## [Chapter 1: What is SQL Server? Introduction, History, Editions, Instances](#)

1. [What is SQL Server?](#)
2. [History SQL Server](#)
3. [SQL Server Editions](#)
4. [MS SQL Server as Client-Server Architecture](#)
5. [Key Components and Services of SQL Server](#)
6. [SQL Server Instances](#)
7. [Importance of SQL Server Instances](#)

## [Chapter 2: How to Download and Install SQL Server](#)

1. [How to download SQL Server Setup](#)
2. [How to Install SQL Server](#)

## [Chapter 3: SQL Server Architecture Explained: Named Pipes, Optimizer, Buffer Manager](#)

1. [Protocol Layer - SNI](#)
2. [Relational Engine](#)
3. [Storage Engine](#)

## [Chapter 4: SQL Server Management Studio \(SSMS\): What is, Install, Versions](#)

1. [Download and Install SQL Server Management Studio](#)

2. [How to access "Management Studio."](#)
3. [Access "Management studio" using Command line.](#)
4. [Introduction to Data Management Studio IDE](#)
5. [SSMS Tips and Issues](#)
6. [SSMS Versions and Updates](#)

## **Chapter 5: SQL Server Database: Create, Alter, Drop, Restore**

1. [Rules to Create a Database](#)
2. [Create Database using SQL Server Management Studio](#)
3. [Create Database with T-SQL](#)
4. [How to Alter Database](#)
5. [Alter Database with SQL Server Management Studio](#)
6. [Alter Database with Transact-SQL](#)
7. [Delete Database](#)
8. [Delete Database SQL Server Management Studio](#)
9. [Delete Database using Transact-SQL](#)
10. [Restore Database](#)

## **Chapter 6: SQL Server DataTypes: Varchar, Numeric, Date Time [T-SQL Examples]**

1. [What is Datatype?](#)
2. [Why use DataTypes?](#)
3. [Data type available in MS SQL](#)

## **Chapter 7: SQL Server Variable: Declare, Set, Select, Global,Local [TSQL Examples]**

1. [What is Variable?](#)

2. [Types of Variable: Local, Global](#)
3. [How to DECLARE a variable](#)
4. [Assigning a value to a VARIABLE](#)

## **Chapter 8: SQL Server Table: CREATE, ALTER, DROP [T- SQL Examples]**

1. [What is a Table?](#)
2. [How to Create a Table](#)
3. [Alter Table](#)
4. [Delete Table](#)

## **Chapter 9: SQL Server PRIMARY KEY: T-SQL Examples**

1. [What is a Primary Key?](#)
2. [How to Create Primary Key](#)

## **Chapter 10: SQL Server FOREIGN KEY: T-SQL Examples**

1. [What is a Foreign Key?](#)
2. [How to Create Foreign Key](#)

## **Chapter 11: SQL Server IF...ELSE Statement: T-SQL Example**

1. [IF... Else statement](#)
2. [IF statement with No Else](#)
3. [Nested IF...Else Statements](#)

## **Chapter 12: CASE statement in SQL Server: T-SQL Example**

1. [Overview of Case in real life!](#)

2. [What is CASE?](#)
3. [Simple CASE](#)
4. [Searched CASE](#)
5. [Difference between Simple and searched case](#)
6. [Nested CASE: CASE in IF ELSE](#)
7. [Nested CASE: CASE inside CASE](#)
8. [CASE with UPDATE](#)
9. [CASE with Order by](#)

### **Chapter 13: SQL Server SUBSTRING() Function: T-SQL Example**

### **Chapter 14: SQL SERVER JOINS Tutorial: INNER, LEFT, RIGHT, OUTER**

### **Chapter 15: Create Login, User, assign Permission: SQL Server Tutorial**

1. [How to Create a Login](#)
2. [How to create a User](#)
3. [Assigning Permission to a User](#)

### **Chapter 16: Oracle Vs. SQL Server: Key Differences**

1. [What is Microsoft SQL server?](#)
2. [What is Oracle Database?](#)
3. [Early History of Microsoft SQL:](#)
4. [Early History of Oracle:](#)
5. [Features of Microsoft SQL Server](#)
6. [Features of Oracle](#)
7. [Difference between SQL Server and Oracle](#)

## **Chapter 17: SSIS Tutorial for Beginners: What is, Architecture, Best Practices**

1. [What Is SSIS?](#)
2. [Why we use SSIS?](#)
3. [History of SIS](#)
4. [SSIS Salient Features](#)
5. [SSIS Architecture](#)
6. [SSIS Tasks Types](#)
7. [Other Important ETL tools](#)
8. [Advantages and Disadvantages of using SSIS](#)
9. [Disadvantages of SSIS](#)
10. [SSIS Best Practices](#)

# Chapter 1: What is SQL Server?

## Introduction, History, Editions, Instances

### What is SQL Server?

SQL Server is a relational database management system (RDBMS) developed by Microsoft. It is primarily designed and developed to compete with MySQL and Oracle database.

SQL Server supports ANSI SQL, which is the standard SQL (Structured Query Language) language. However, SQL Server comes with its own implementation of the SQL language, T-SQL (Transact- SQL).

**T-SQL** is a Microsoft propriety Language known as **Transact-SQL**. It provides further capabilities of declaring variable, exception handling, stored procedure, etc.

SQL Server Management Studio (SSMS) is the main interface tool for SQL Server, and it supports both 32-bit and 64-bit environments.

### History SQL Server

Microsoft and Sybase released version 1.0 in 1989. However, the partnership between these two ended in the early 1990s. Microsoft maintained ownership rights to the name SQL Server. Since the 1990s,

subsequent versions of SQL Server have been released including SQL Server 2000, 2005, 2008, 2012, 2014, 2016 and 2017.

## SQL Server Editions

Following editions are available

**SQL Server Enterprise:** It is used in the high end, large scale and mission Critical business. It provides High-end security, Advanced Analytics, Machine Learning, etc.

**SQL Server Standard:** It is suitable for Mid-Tier Application and Data marts. It includes basic reporting and analytics.

**SQL Server WEB:** It is designed for a low total-cost-of-ownership option for Web hosters. It provides scalability, affordability, and manageability capabilities for small to large scale Web properties.

**SQL Server Developer:** It is similar to an enterprise edition for the non-production environment. It is mainly used for build, test, and demo.

**SQL Server Express:** It is for small scale applications and free to use.

## MS SQL Server as Client-Server Architecture

Let's have a look at the below early morning conversation between Mom and her Son, Tom.



### **Brainstorm:**

**Ask your brain....!!!** "Can you map, who is CLIENT and who the SERVER is?"

The most certain reply would be - "I am pretty smart in that and.... Son is a CLIENT as he is requesting for a cup of coffee and Mother, who is CAPABLE of preparing coffee, is a SERVER."

Here, Tom is requesting his mother, a cup of coffee. Finally, mom does some processing with Milk, coffee, sugar and prepare coffee to serve it hot.

**Analogy:** MS SQL SERVER architecture.

A CLIENT is an application that sends requests to the MS SQL SERVER installed on a given machine. The SERVER is capable of processing input data as requested. Finally, respond with PROCESSED OUTPUT DATA as a result.

# Key Components and Services of SQL Server

**Database Engine:** This component handle storage, Rapid transaction Processing, and Securing Data.

**SQL Server:** This service starts, stops, pauses, and continues an instance of Microsoft SQL Server. Executable name is sqlservr.exe.

**SQL Server Agent:** It performs the role of Task Scheduler. It can be triggered by any event or as per demand. Executable name is sqlagent.exe.

**SQL Server Browser:** This listens to the incoming request and connects to the desired SQL server instance. Executable name is sqlbrowser.exe.

**SQL Server Full-Text Search:** This lets user running full-text queries against Character data in SQL Tables. Executable name is fdlauncher.exe.

**SQL Server VSS Writer:** This allows backup and restoration of data files when the SQL server is not running. Executable name is sqlwriter.exe.

**SQL Server Analysis Services (SSAS):** Provide Data analysis, Data mining and Machine Learning capabilities. SQL server is integrated with R and Python language for advanced analytics.  
Executable name is msmdsrv.exe.

**SQL Server Reporting Services (SSRS):** Provides reporting features and decision-making capabilities. It includes integration with Hadoop. Executable name is ReportingServicesService.exe

**SQL Server Integration Services (SSIS):** Provided Extract- Transform and Load capabilities of the different type of data from one source to another. It can be view as converting raw information into useful information. Executable name is MsDtsSrvr.exe

## SQL Server Instances

SQL Server allows you to run multiple services at a go, with each service having separate logins, ports, databases, etc. These are divided into two:

- Primary instances
- Named instances.

There are two ways through which we may access the primary instance. First, we can use the server name. Secondly, we can use its IP address. Named instances are accessed by appending a backslash and instance name.

For example, to connect to an instance named xyx on the local server, you should use 127.0.0.1\xyz. From SQL Server 2005 and above, you are allowed to run up to 50 instances simultaneously on a server.

Note that even though you can have multiple instances on the same server, only one of them must be the default instance while the rest must be named instances. One can run all the instances concurrently, and each instance runs independent of the other instances.

## Importance of SQL Server Instances

The following are the advantages of SQL Server instances:

## **1. For installation of different versions on one machine**

You can have different versions of SQL Server on a single machine. Each installation works independently from the other installations.

## **2. For cost reduction**

Instances can help us reduce the costs of operating SQL Server, especially in purchasing the SQL Server license. You can get different services from different instances, hence no need for purchasing one license for all services.

## **3. For maintenance of development, production and test environments separately**

This is the main benefit of having many SQL Server instances on a single machine. You can use different instances for development, production and test purposes.

## **4. For reducing temporary database problems**

When you have all services running on a single SQL Server instance, there are high chances of having problems with the problems, especially problems that keep on recurring. When such services are run on different instances, you can avoid having such problems.

## **5. For separating security privileges**

When different services are running on different SQL Server instances, you can focus on securing the instance running the most sensitive service.

## **6. For maintaining a standby server**

A SQL Server instance can fail, leading to an outage of services. This explains the importance of having a standby server to be brought in if the current server fails. This can easily be achieved using SQL Server instances.

## **Summary:**

- SQL Server is defined as a relational database management system (RDBMS) developed by Microsoft
- T-SQL means Transact-SQL, a propriety Language by Microsoft Microsoft and Sybase released version 1.0 in 1989
- Various Editions of SQL Server are Enterprise, Standard, Web, Developer, and Express
- Critical components of SQL Server are Database Engine, SQL Server, SQL Server Agent, SQL Server Browser, SQL Server Full- Text Search, etc.
- You can run multiple instances of SQL Server the same on the same machine.

# Chapter 2: How to Download and Install SQL Server

## Pre-Requisites

Principally, MS SQL server requires:

.Net Framework, 1GB of recommended memory, and NTFS system.

## How to download SQL Server Setup

**Step 1)** Go to URL: <https://www.microsoft.com/en-in/sql-server/sql-server-downloads>

Microsoft provides **two specialized free editions** to work on MS SQL server:

1. **Developer** – It has all feature which MS SQL server offers but we cannot use it in production. From the learning perspective, is it an ideal candidate to start.
2. **Express**: This is also a free version but with the limited set of features with no business intelligence applications.

We will select the **Developer edition** for installation.

**Step 2)** Click on "**Download now**"

Or, download a free specialised edition



**Developer**  
SQL Server 2017 Developer is a full-featured free edition, licensed for use as a development and test database in a non-production environment.  
[Download now](#)

**Express**  
SQL Server 2017 Express is a free edition of SQL Server, ideal for development and production for desktop, web, and small server applications.  
[Download now](#)

**Click Here**

We will get set up as '**SQLServer2017-SSEI-Dev.exe**'.



## How to Install SQL Server

**Step 1)** Double click on "**SQLServer2017-SSEI-Dev.exe**". Below screen will appear with three options: Basic, Custom and Download files.

SQL Server 2017



# Developer Edition

Select an installation type:

<p><b>1</b></p> <h2>Basic</h2> <p>Select Basic installation type to install the SQL Server Database Engine feature with default configuration.</p>	<p><b>2</b></p> <h2>Custom</h2> <p>Select Custom installation type to step through the SQL Server installation wizard and choose what you want to install. This installation type is detailed and takes longer than running the Basic install.</p>	<p><b>3</b></p> <h2>Download Media</h2> <p>Download SQL Server setup files now and install them later on a machine of your choice.</p>
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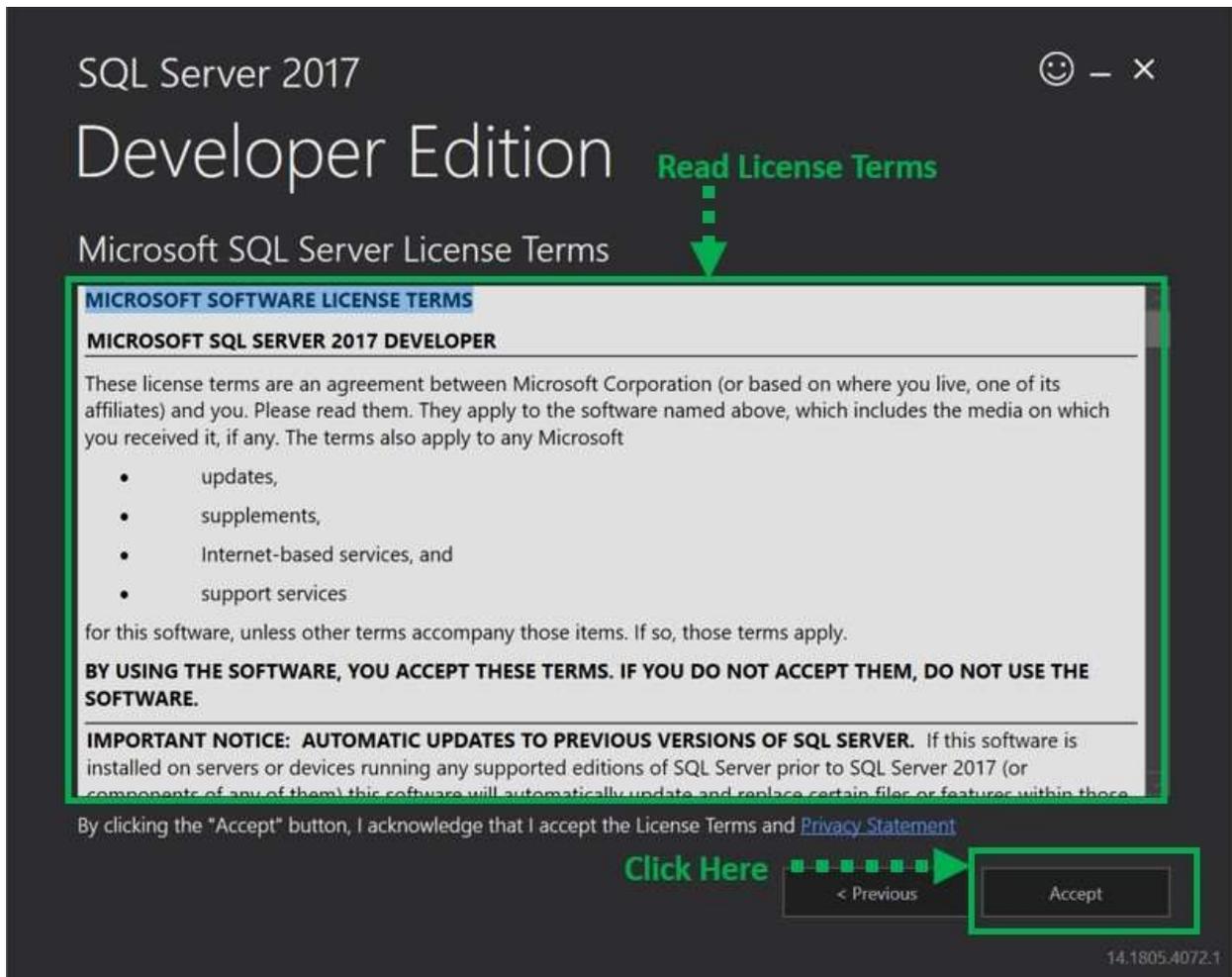
SQL Server transmits information about your installation experience, as well as other usage and performance data, to Microsoft to help improve the product. To learn more about data processing and privacy controls, and to turn off the collection of this information after installation, see the [documentation](#)

14.1805.4072.1

**Step 2)** Choose the basic version by clicking on the '**Basic**' option, as it has all default configuration required to learn MS SQL.

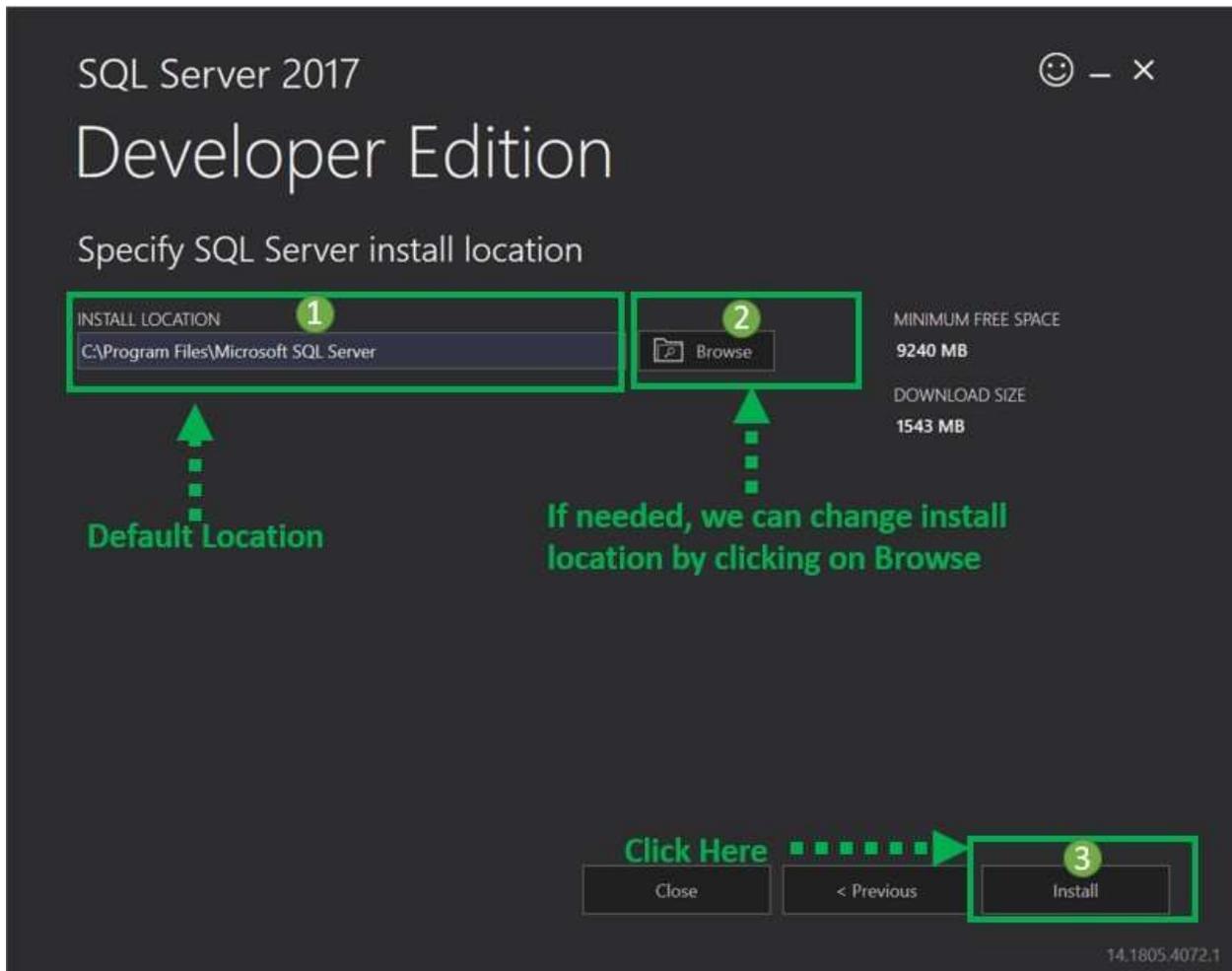


**Step 3) 'Microsoft Server License Terms' screen will appear. Read the License Terms and then click 'Accept.'**

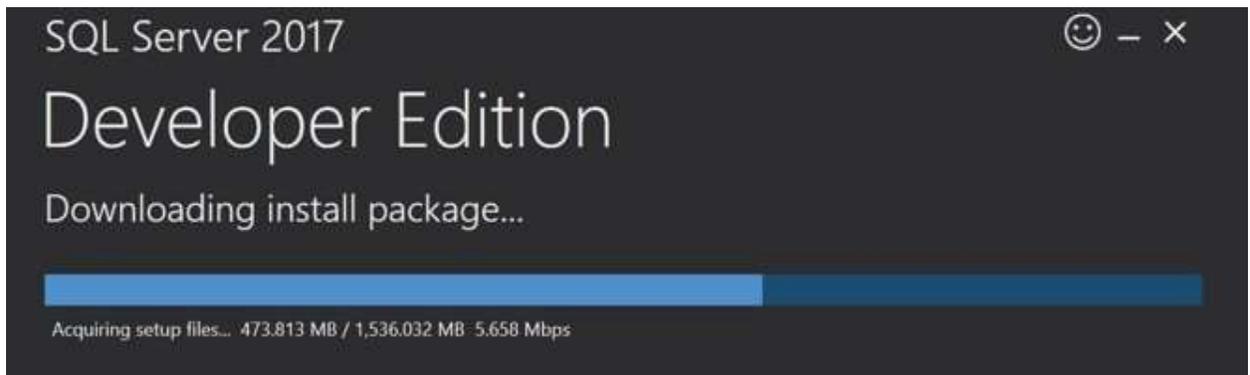


**Step 4)** Below 'SQL server install location' window will appear.

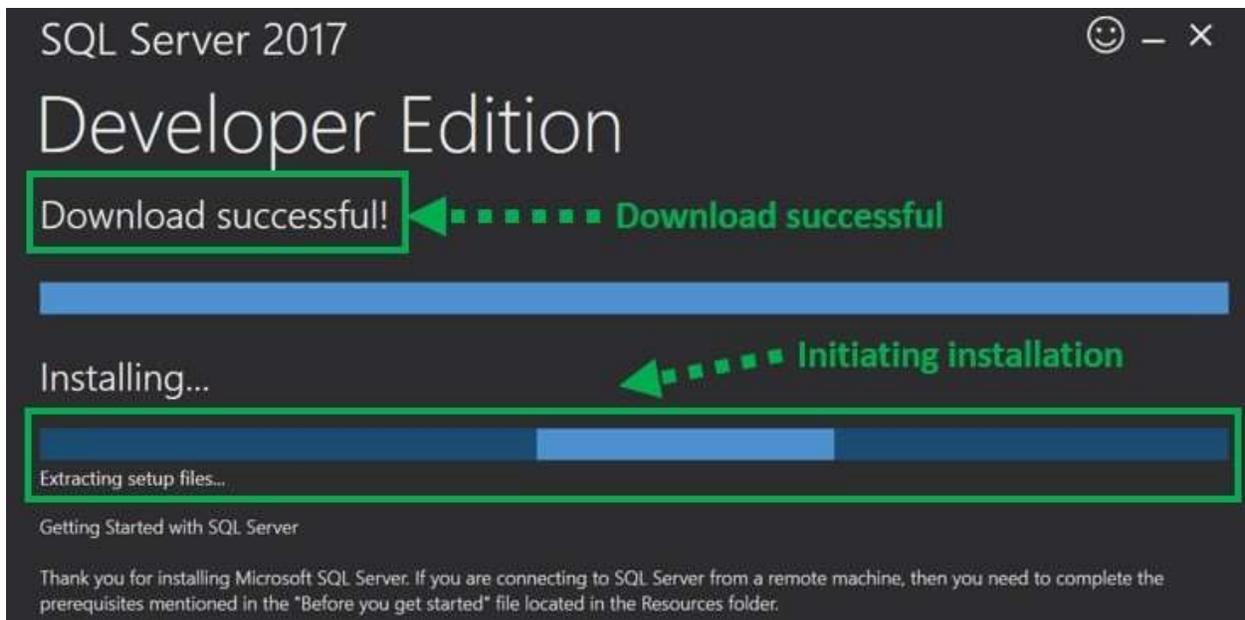
1. The Default location is **C:\Program Files\Microsoft SQL Server**.
2. Optionally, we can also change the installation location by clicking on **Browse**.
3. Once the location is selected, click **the 'Install'** button.



Below '**Downloading install package**' progress screen will be displayed. Wait until the download is complete.



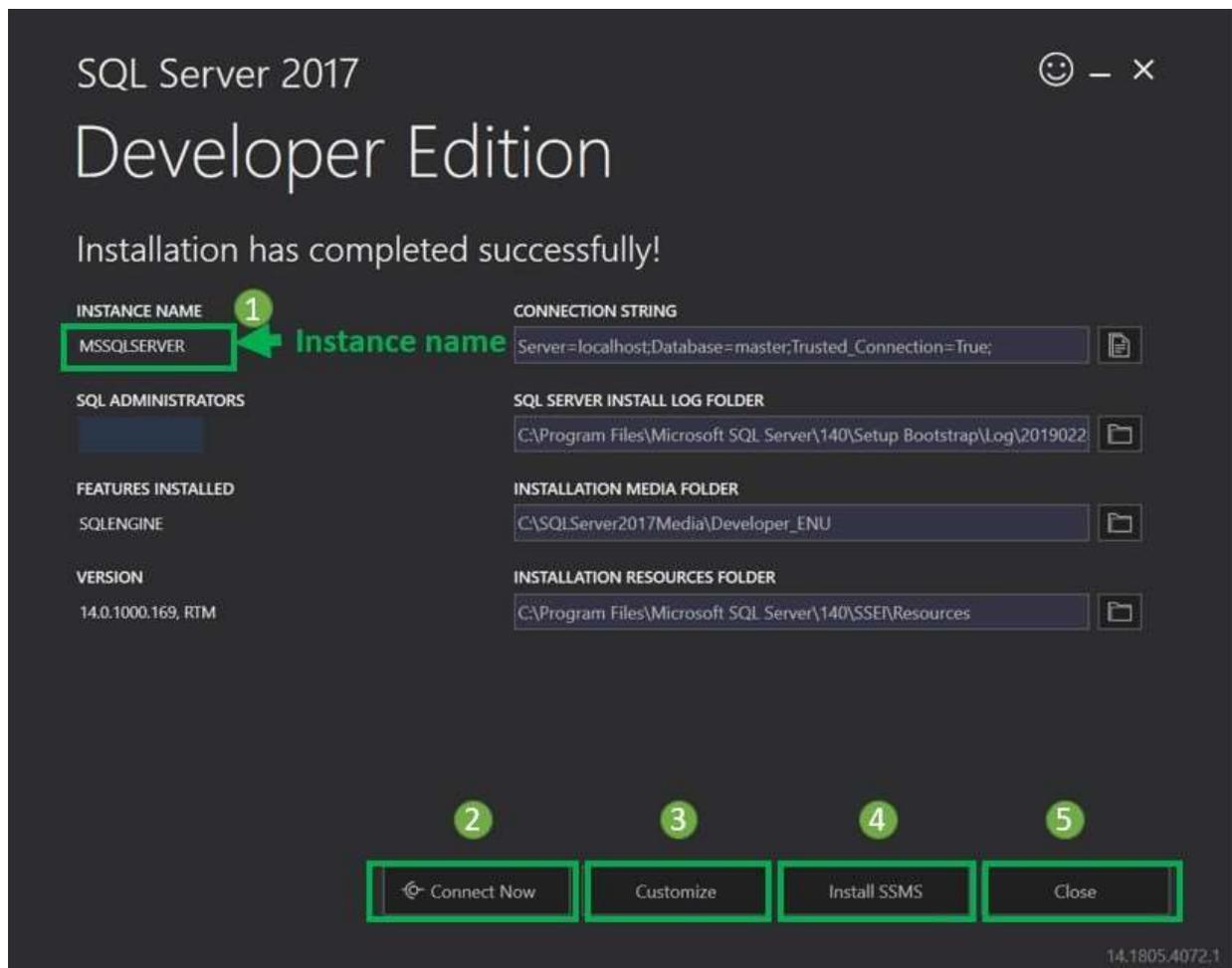
Once, the download is complete; the system will initiate installing developer edition.



Below screen show **installation progress**.



**Step 5)** Once installation is completed successfully, below screen will appear.



This setup is **self-sufficient for proceeding further** with learning SQL server, and we can 'Close' this window.

However, below is a summary of the label and button:

1. **Instance name:** This is by default labeled as MSSQLSERVER.
2. **Connect now:** This will open a separate command line window for connection testing of what we have just installed.

The system will run by default '**select @@Version**' statement to confirm that we can connect to new MSSQLSERVER instance successfully.

```
SQLCMD
--
-- run below command from command prompt
-- sqlcmd -S USMUMPHURDE4 -E
--
select @@Version
go
```

-----  
-----  
Microsoft SQL Server 2017 (RTM) - 14.0.1000.169 (X64)  
Aug 22 2017 17:04:49  
Copyright (C) 2017 Microsoft Corporation  
Developer Edition (64-bit) on Windows 10 Enterprise 10.0 <X64> (Build 15063: )

(1 rows affected)  
1>

Query result displaying successful connect to MSSQLSERVER instance

3. **Customize:** This will open the **SQL Installation center** to customize further and add feature other than which are there as a part of the BASIC installation.
4. **Install SSMS:** This is IDE which will take us to Microsoft SSMS download link. We will cover SSMS in detail in our SSMS tutorial.
5. **Close:** This will close this window. The user is now ready to install SSMS IDE as instructed in SSMS tutorial.

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