2021

We Vote Database Training Document

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Summary

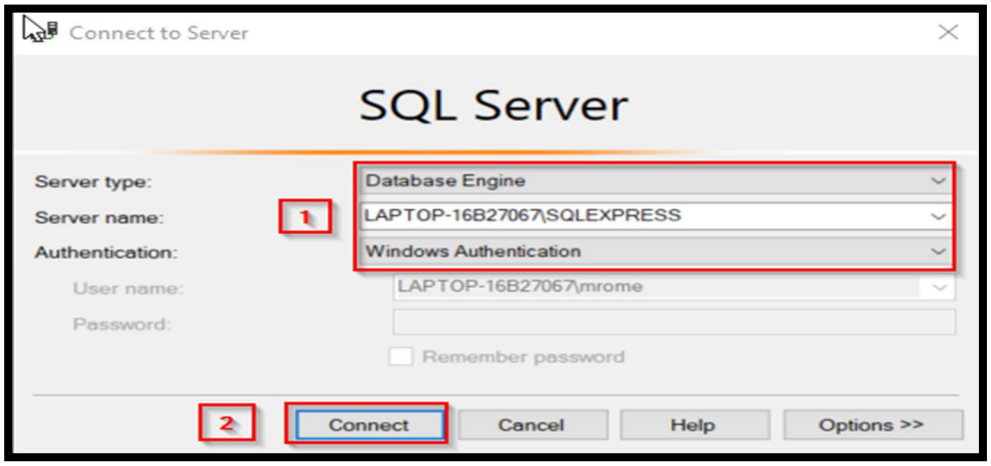
The purpose of this document is to provide guideline on the steps required to create a database backup, assign sysadmin and database owner roles, update tables by using bulk insert and change the data types in the "WeVote" database.

Please note that these procedures have been simplified. It is recommended to refer to the references at the end of this document for more details.

Login to SQL Server

The SQL Server Management Studio (SSMS) is used to create and manage the "WeVote" database. The assumption is that the database is already created in your local machine (local server) and can access it through SSMS (installed to your local computer) as default Sysadmin (sa). You can log in to SSMS through Windows Authentication (local computer login). This method does not require login credentials as authenticated through Windows login.

1) Open **Microsoft SQL Server Management Studio (SSMS)** from your computer with **default Server type, Server name,** and **Authentication**.
2) Click **connect** to log in to **SSMS**.



Database Backup (Full and Differential)

It is critical to back up the database on regular basis to maintain the security and integrity of the database. The steps below summarize the procedure to save a differential and full back when necessary.

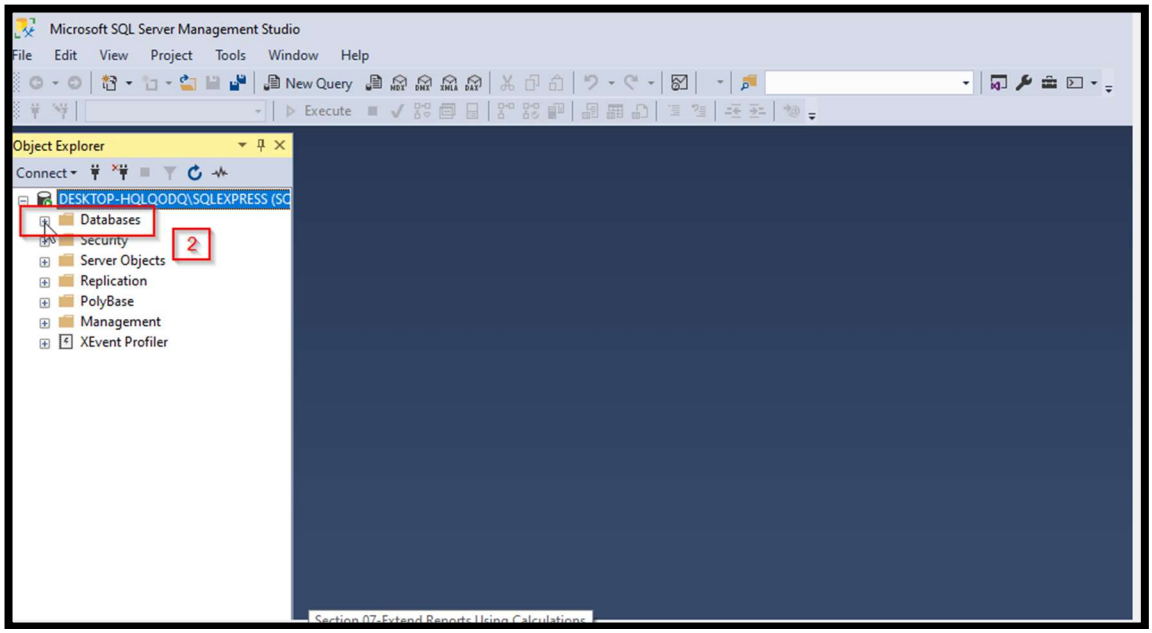
Further information on different types of backups and the suggested schedule, is provided in the "Database_Security_and_Backup_Plan".

➢ Full Backup

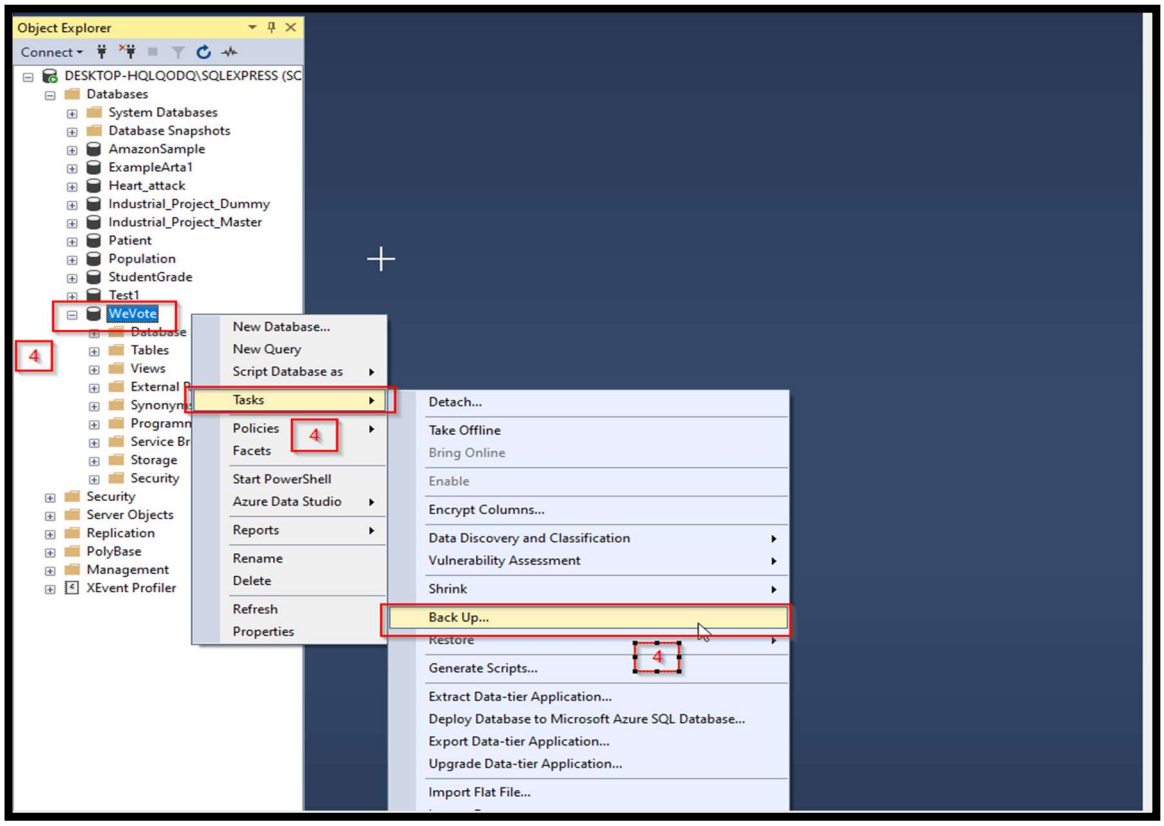
The sysadmin and the db_owner database roles are responsible for backing up the database on regular basis. These roles will be described later in this document.

Please follow the steps below to save a full backup to a specific location (a hard drive or a cloud base storage).

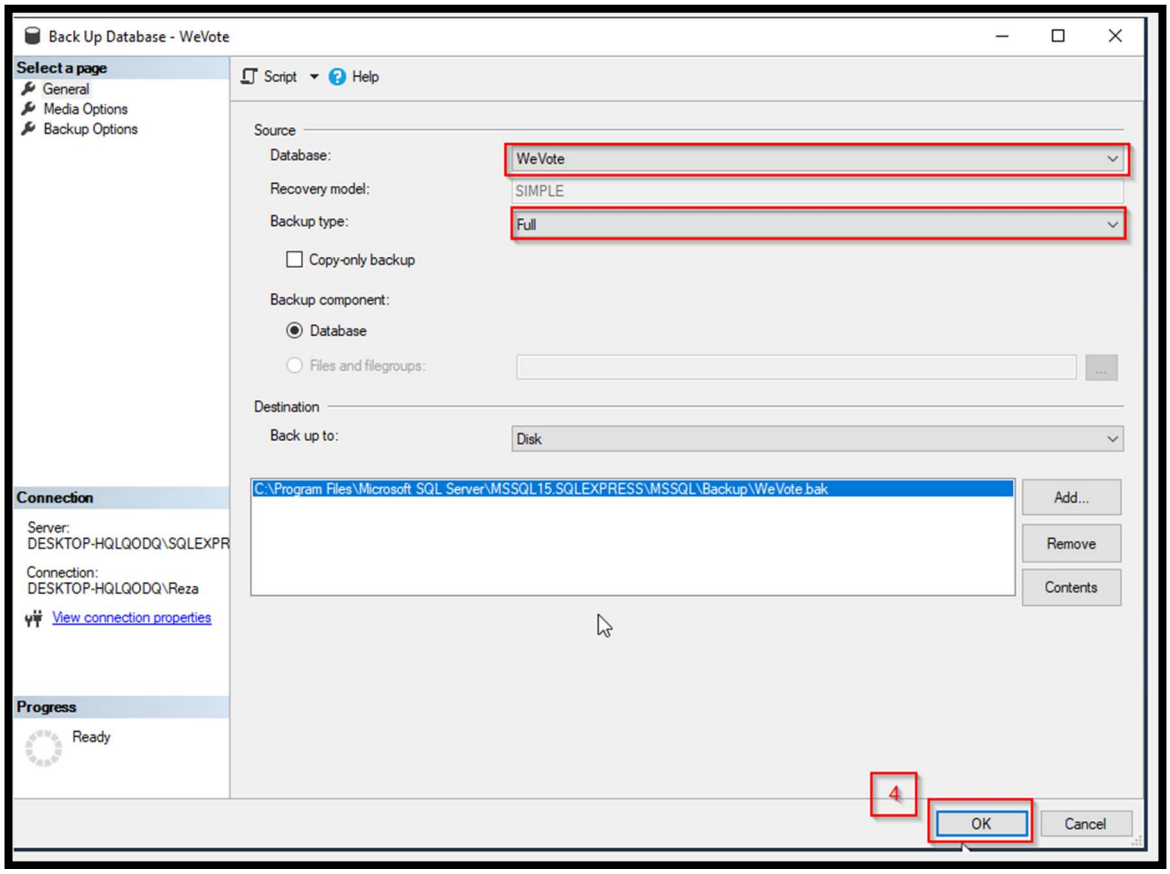
1) Connect to SQL Server (Login to SQL Server).
2) Expand the Object Explorer, expand the server tree.



3) Expand **Databases,** locate **WeVote,** right-click WeVote database. Then hover the mouse over **Tasks** and click **Back Up.**



4) When the backup completes successfully, click **OK** to close the SQL Server Management Studio dialog box.

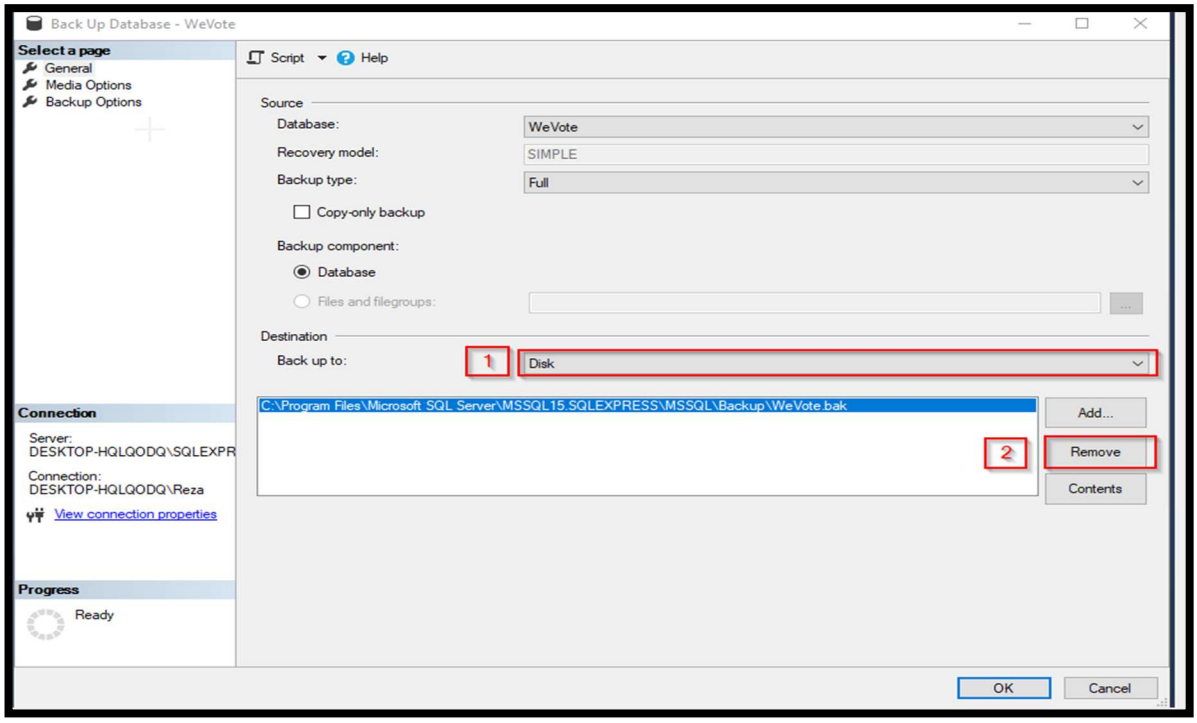


5) The completed backup file can be found in the following directory on Windows systems.

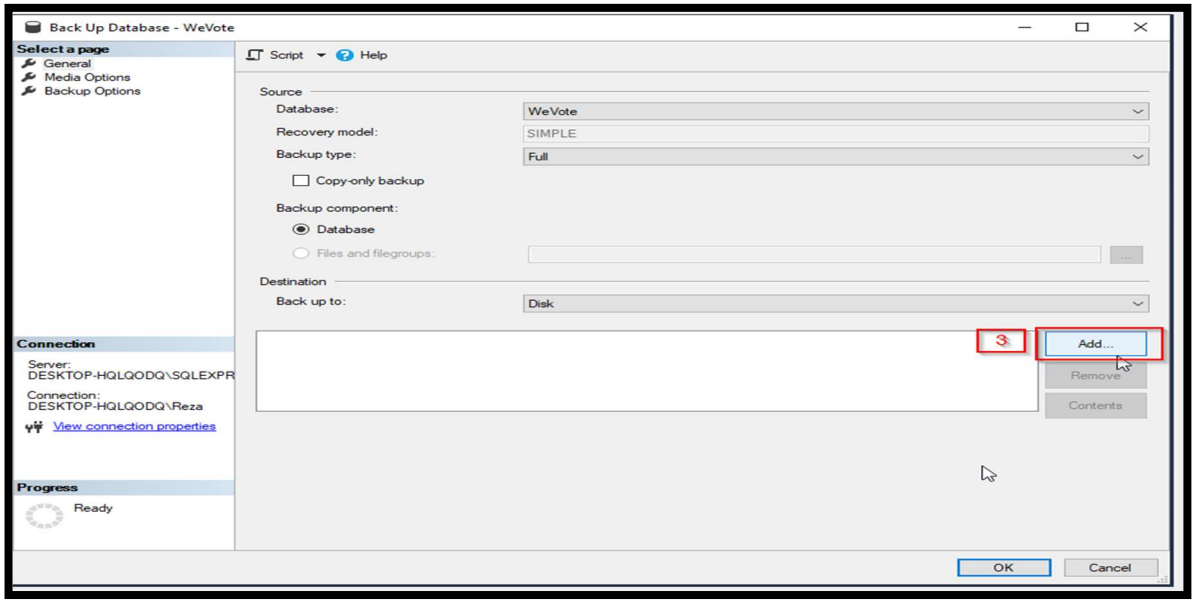
C:\Program Files\Microsoft SQL Server\MSSQL15.SQLEXPRESS\MSSQL\Backup

If you wish to change the file destination for the backup, follow the steps below.

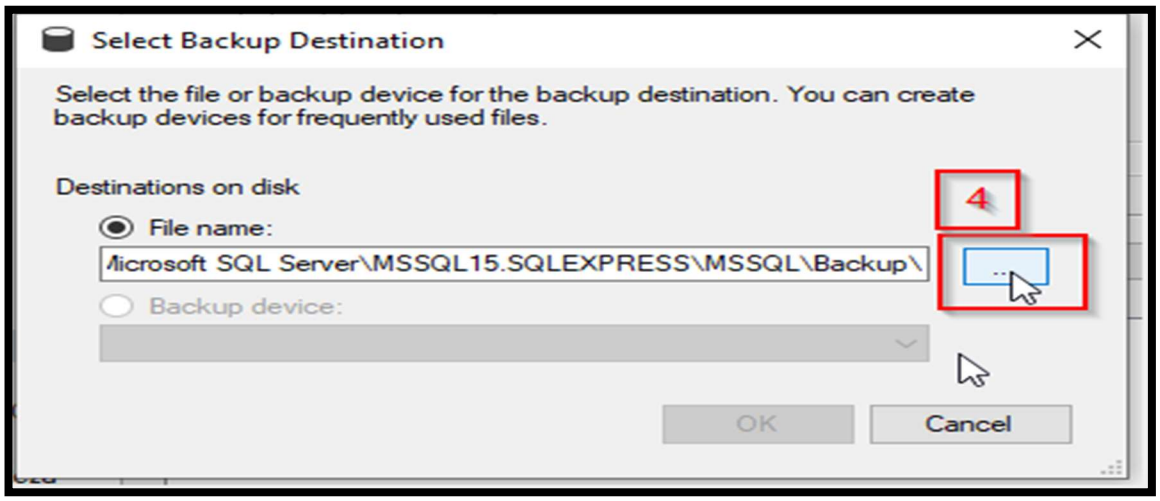
1) From the **Backup Database-WeVote** page (refer to step 4 in the previous section), select **Disk** in the **Back up to:** drop-down list.
2) Select **Remove** until all existing backup files are removed.



3) Select **Add** to open **Backup Destination Path.**



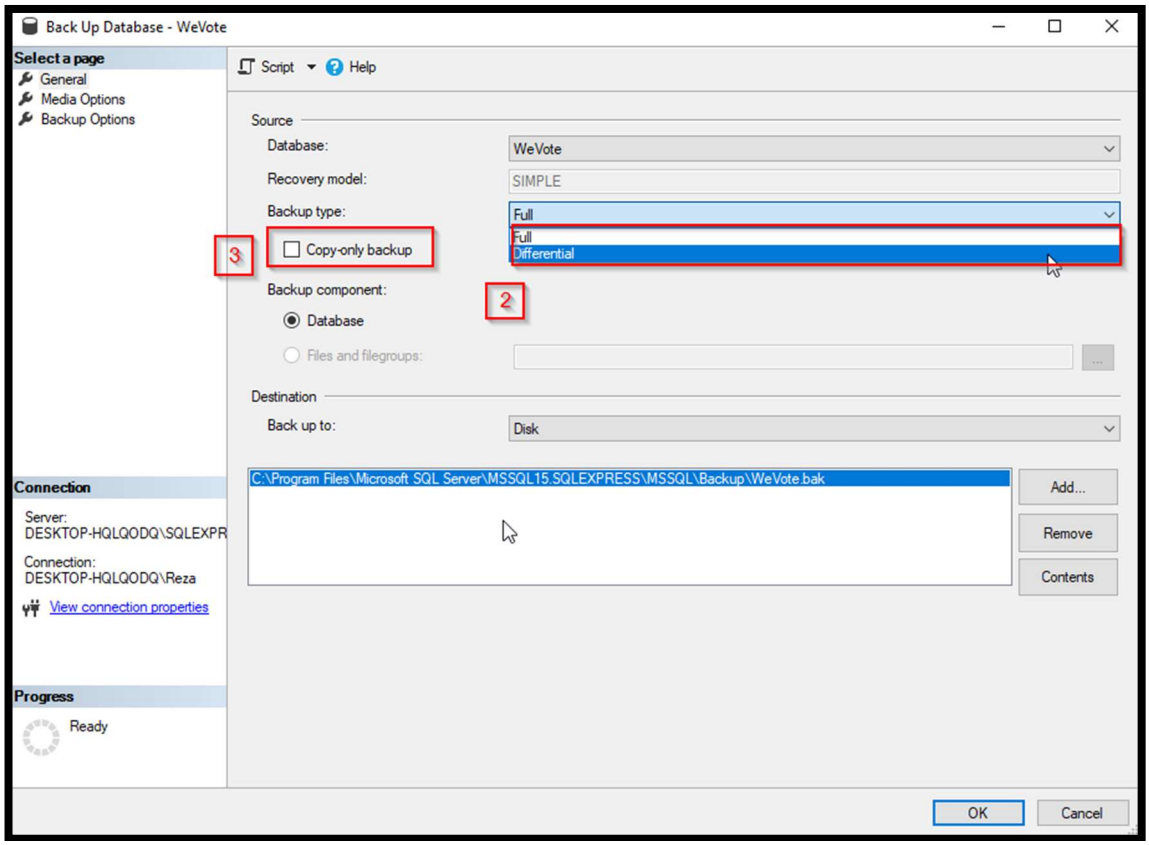
4) Enter your desired path and file name in the File name text box and use **.bak** as the extension.



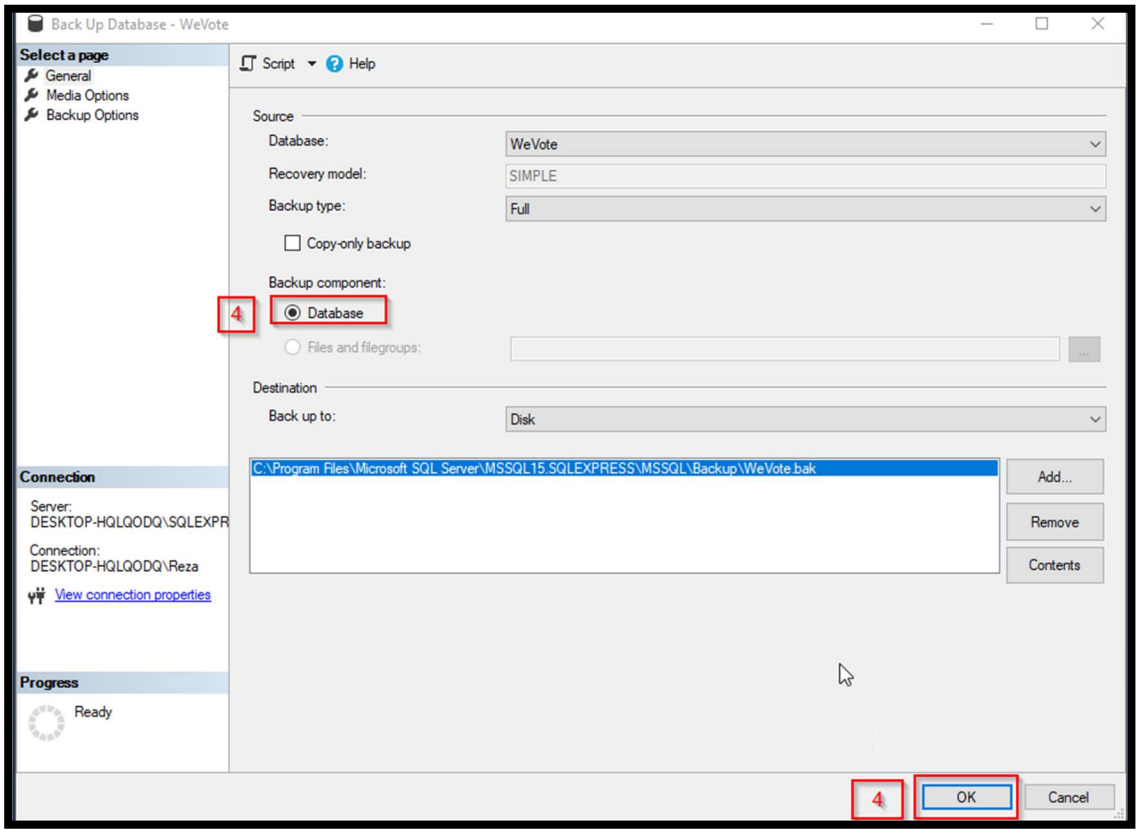
5) Click OK twice to initiate the backup.
6) When the backup completes successfully, click OK to close the SQL Server Management Studio dialog box.

➢ Differential Backup

1) Repeat steps 1 – 4 from Full Backup.
2) In the **Backup type** list box, select **Differential.**
3) Verify that the **Copy Only Backup** check box is not selected.



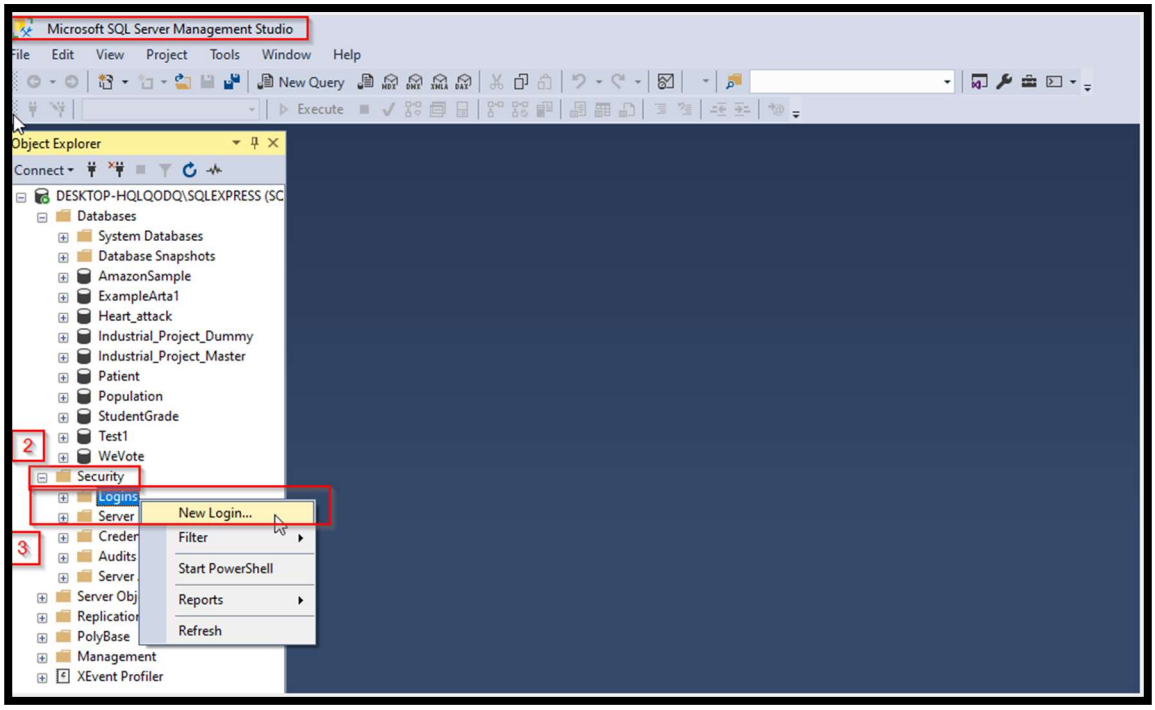
4) Choose **Database** as **Backup component** and then click **OK** to complete the differential backup.



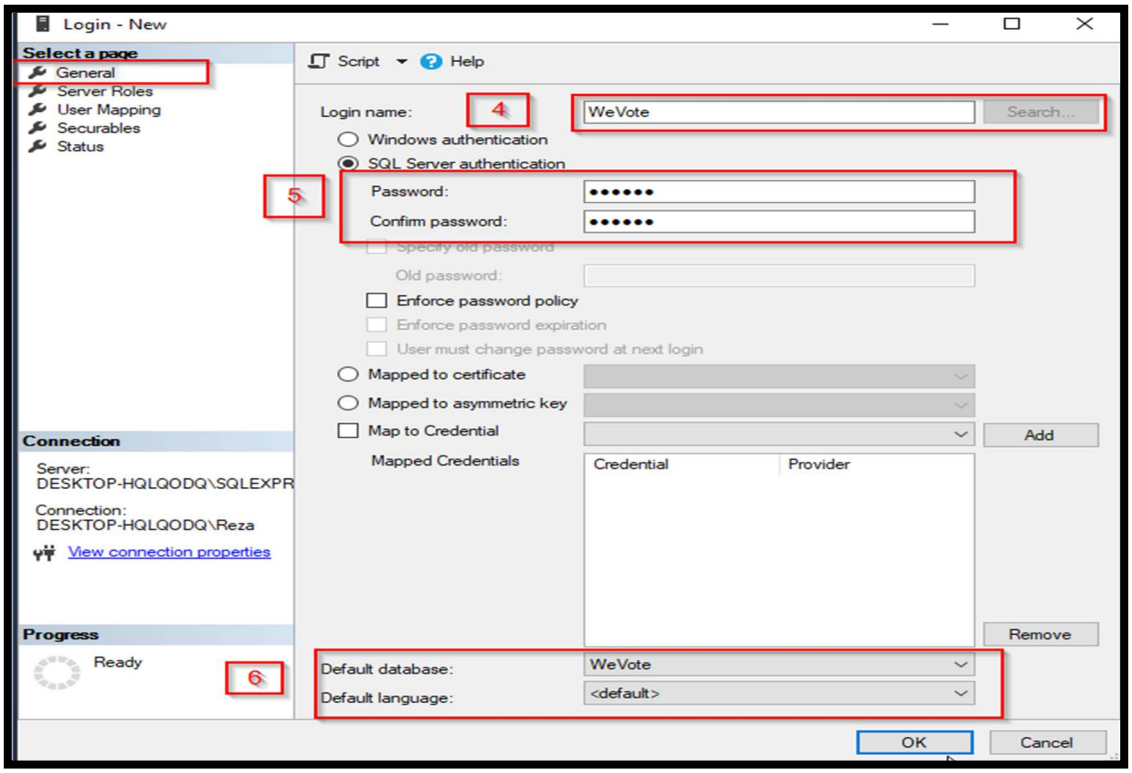
Assigning sysadmin and db_owner Roles

Sysadmin (sa) role can perform any activity within the SSMS environment and the database on the server. To create a new user with system administrator and db_owner rights, perform the following steps:

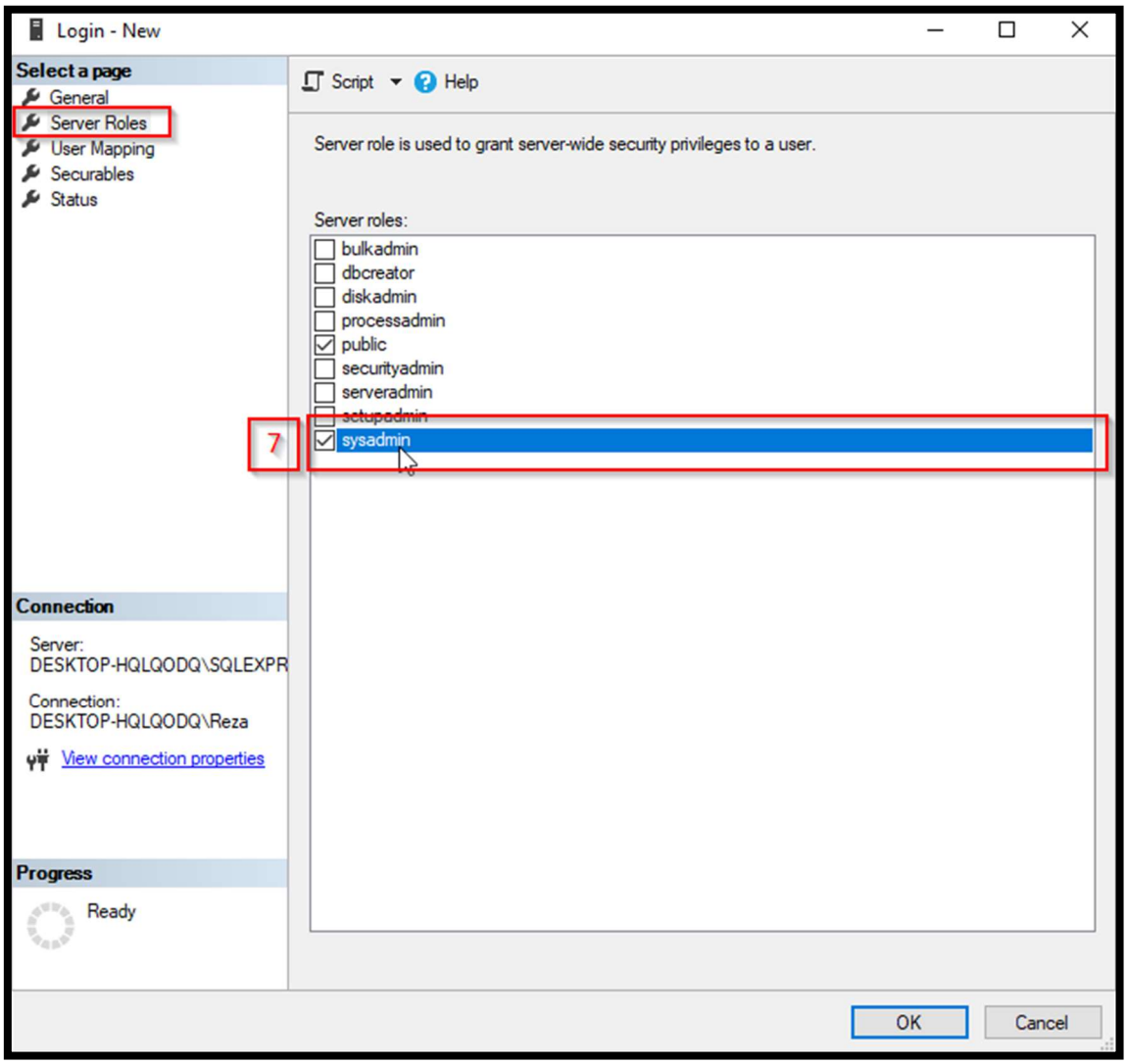
1) Connect to SQL Server (Login to SQL Server).
2) In the **Object Explorer** of **SQL Server Management Studio,** navigate to the **Security** folder and expand it.
3) Right-click the **Logins** folder and choose **New Login.** The **New Login** dialog box opens.



4) Select the **General** page, and then enter a username (eg. WeVote) in the **Login name** text box.
5) Select **SQL Server Authentication** and enter a password.
6) Select the **WeVote** database from the **Default database** list.

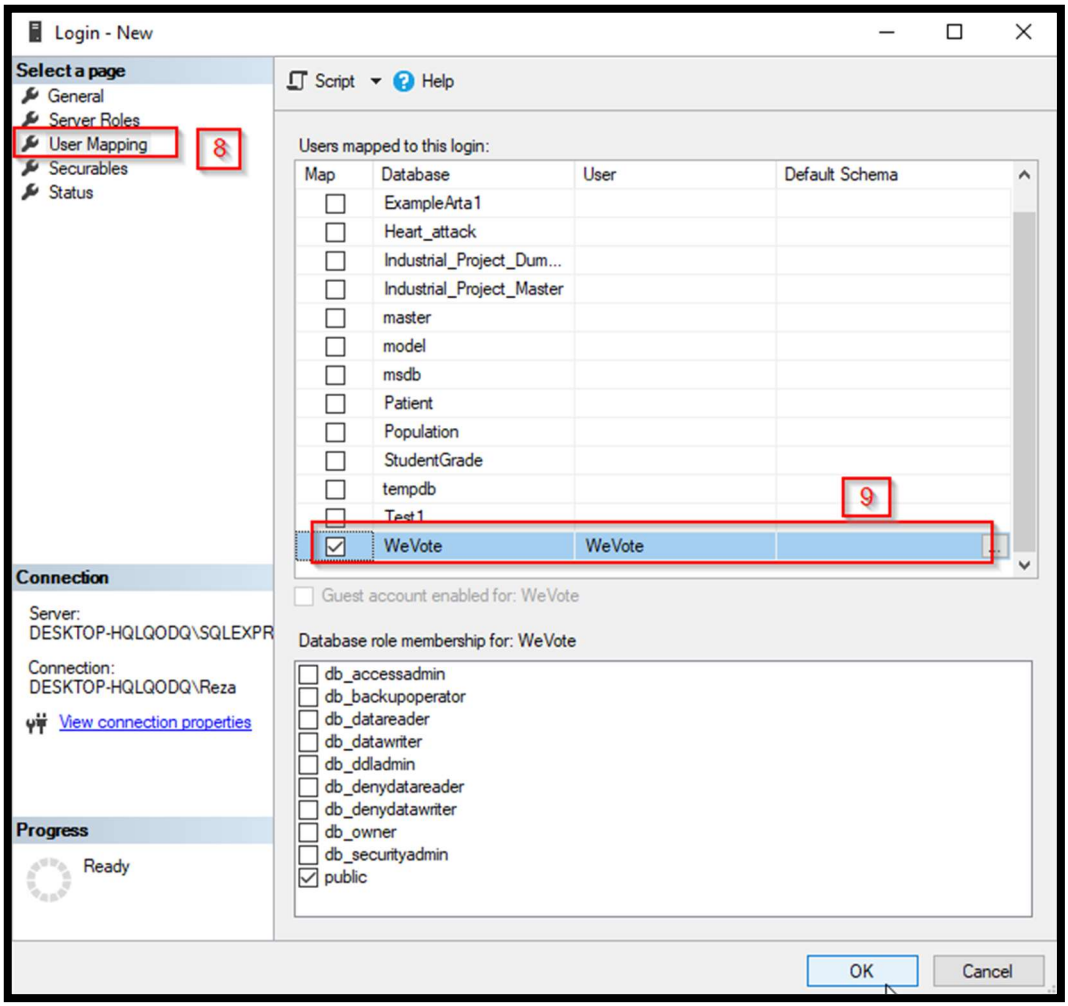


7) Select the **Server Roles** page, and then check the **sysadmin** check box in the **Server roles** list.

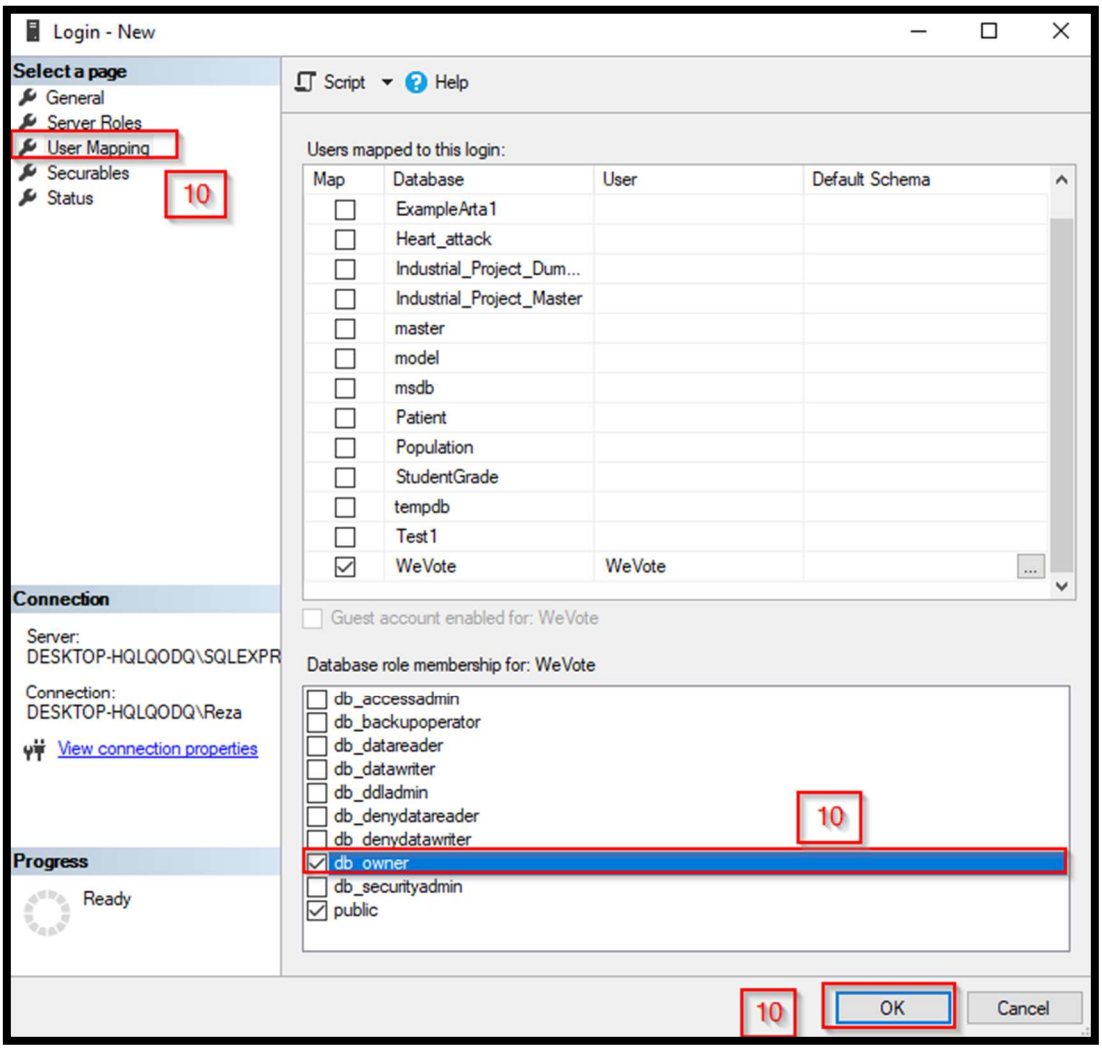


8) Select the **User Mapping** page.

9) In the **Map** column, check the check box for the database. The login name shows in the **User** column as default.



10) In the **Database role membership for** list, check the **db_owner** check box and click **OK.**



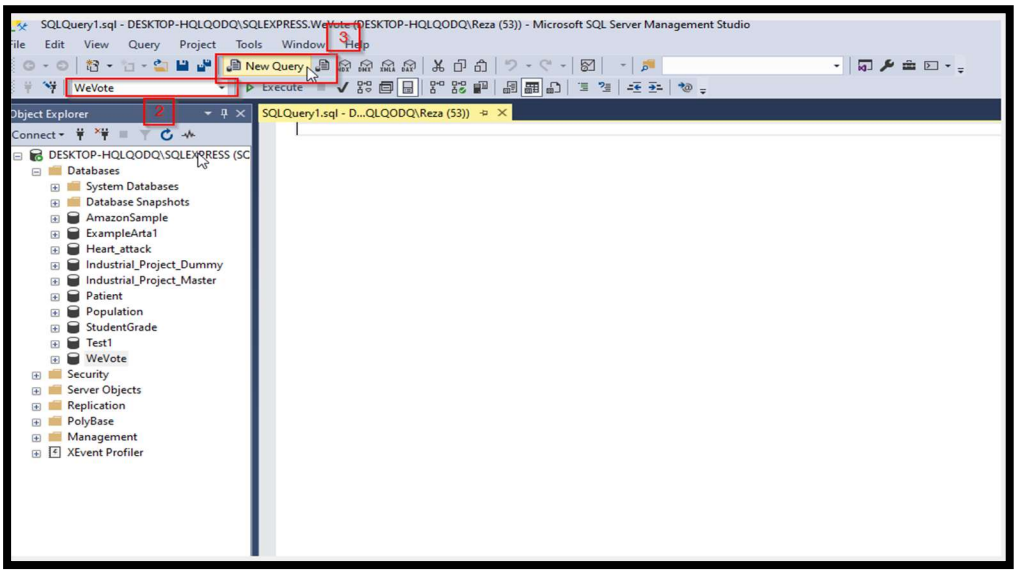
Update Tables Using Bulk Insert

Bulk Insert loads data from a data file into a table or views in a user-specified format in SQL server. It is assumed that the file format that would be used to update the "WeVote" database is CSV (Excel format).

For demonstration purposes, a source file "**CandidateName.csv**" saved in the "**C:**" directory is assumed.

It is recommended that the tasks to insert and update tables in the database be performed by an individual with SQL experience. This is crucial to maintain the integrity of the database. However, a simplified version of the procedure is summarized below for the users.

1) Connect to SQL Server (Login to SQL Server).
2) Expand the Object Explorer, expand the server tree and **Databases**, and select **WeVote**.
3) Click the **New Query** to create a new blank query page.

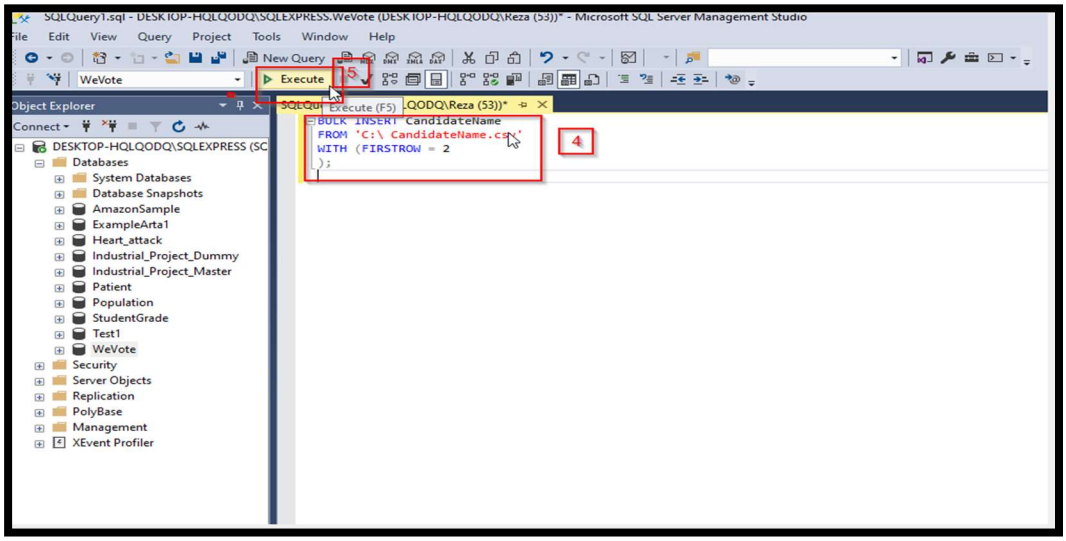


4) Insert below syntaxes to the blank query page. Please note that table name and file name here are just an example and need to be replaced with new information.

```
BULK INSERT CandidateName
FROM 'C:\ CandidateName.csv'
WITH (FIRSTROW = 2
);
```

a. **BULK INSERT** is a reserved SQL syntax followed by the table name you want to insert.
b. **FROM** is a reserved SQL syntax that specifies the path that we stored the CSV file we want to insert.
c. **WITH** is a reserved SQL syntax that will be used to add some conditions into our syntax.
d. **FIRST ROW** a reserved SQL syntax that specifies the starting row of the CSV file we want to insert. In this example, we want to skip the header, so the first row is equal to 2.
e. "CandidateName" is the table you wish to update.
f. "C:\ CandidateName.csv" is the source file including the new data.

5) After inserting the syntaxes in step 4 click the *Execute* button to import the new data to the database.

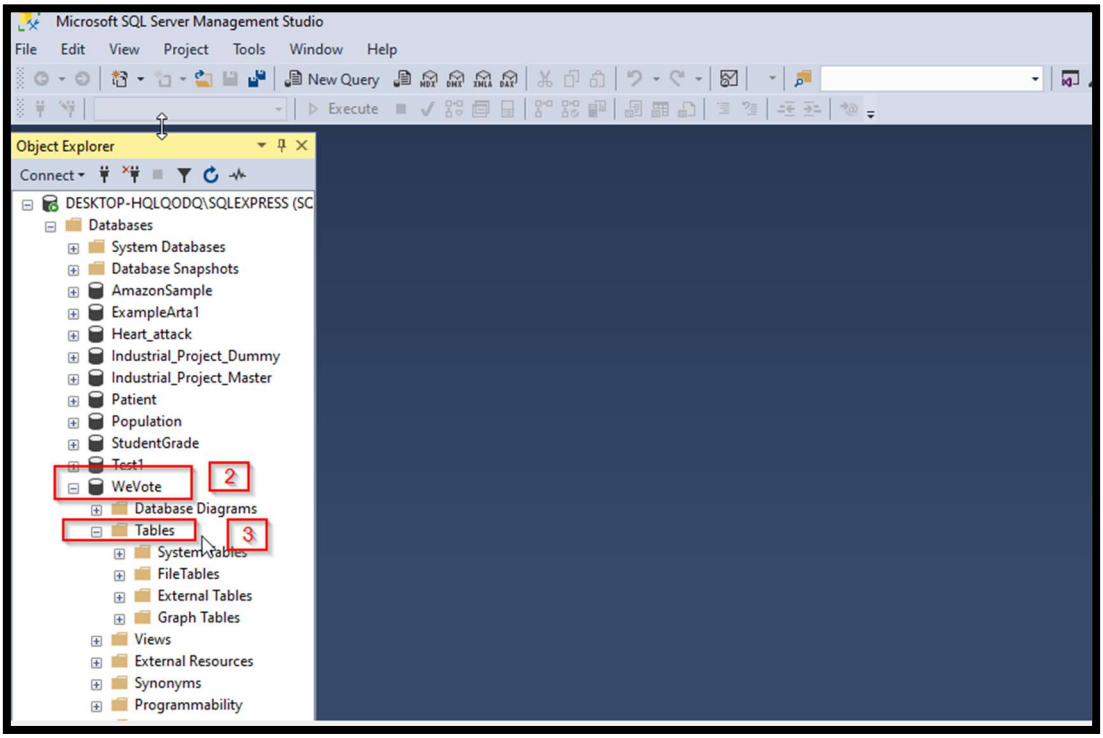


Changing Data Types

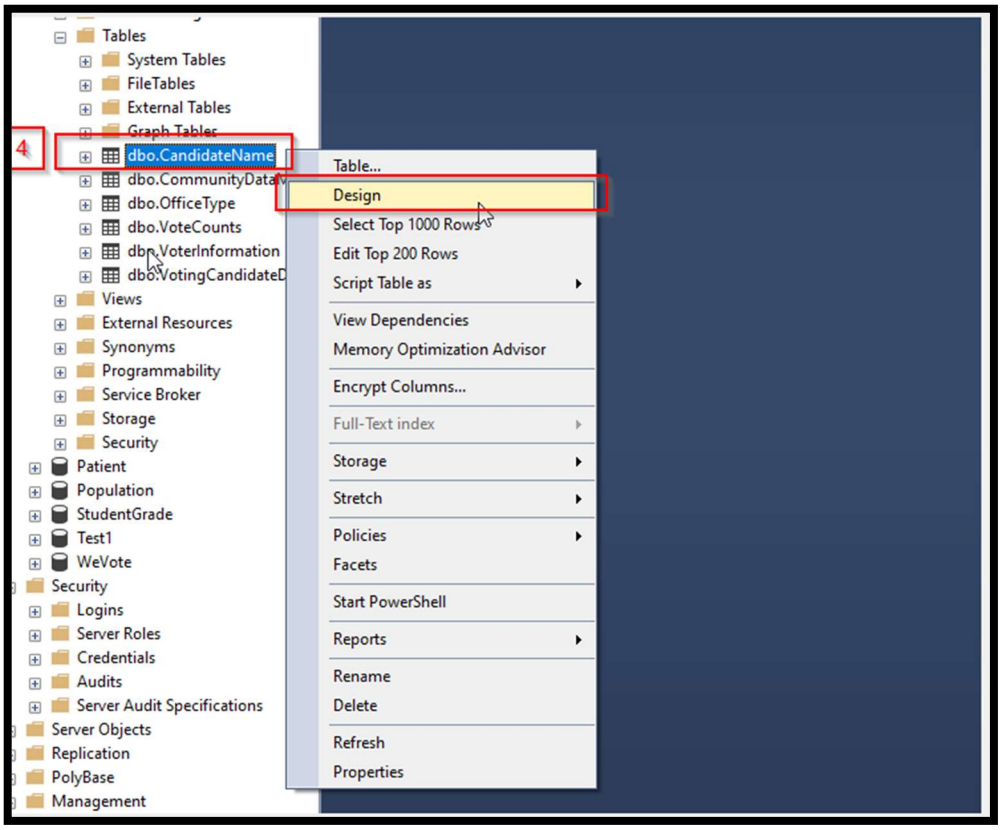
In general, it is not recommended to change the data type in the "WeVote" database except for the character-string data type. For example, in the "WeVote" database, the CandidateNames data type is varchar(30). If there is a candidate whose name is more than 30 characters, you may need to update the varchar(30) scale to varchar(40).

To change the data type of a column or field in SQL Server Management Studio, perform the following steps:

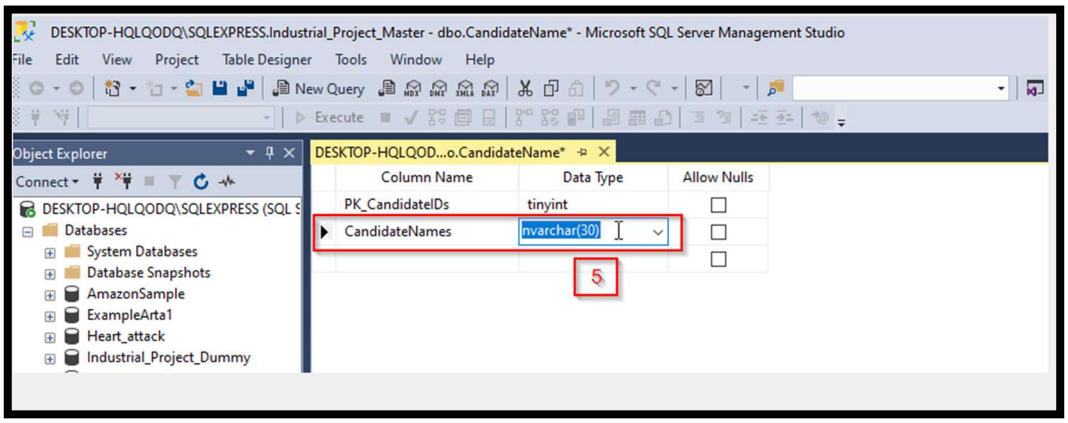
1) Connect to SQL Server (Login to SQL Server).
2) Expand the Object Explorer, expand the server tree and **Databases**, and select **WeVote**.
3) Navigate to the **Tables** folder and expand it.



4) Right-click the table with the columns for which you want to change the scale and click **Design** (eg. Dbo.CandidateName).

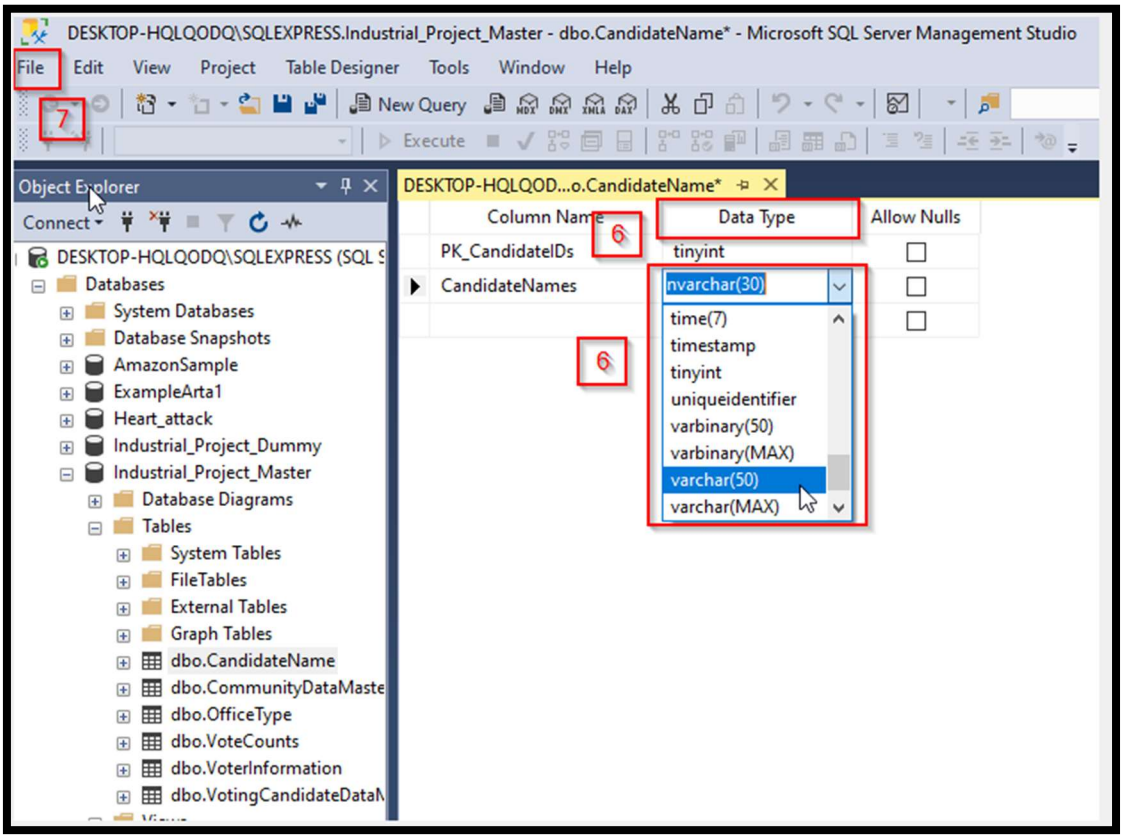


5) Select the column for which you want to modify the data type.



6) In the **Data Type** tab, click the grid cell for the Data Type property and choose a new data type from the drop-down list or change the variable length. Update the old data type (e.g. varchar(30)) to new data type (e.g. varchar(40)).

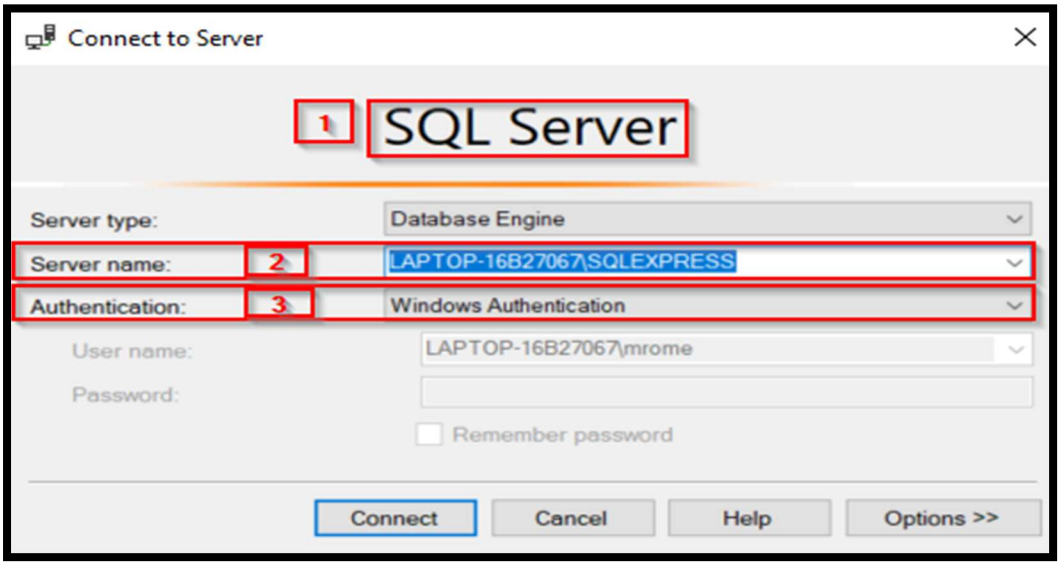
7) On the File menu, click Save table name.



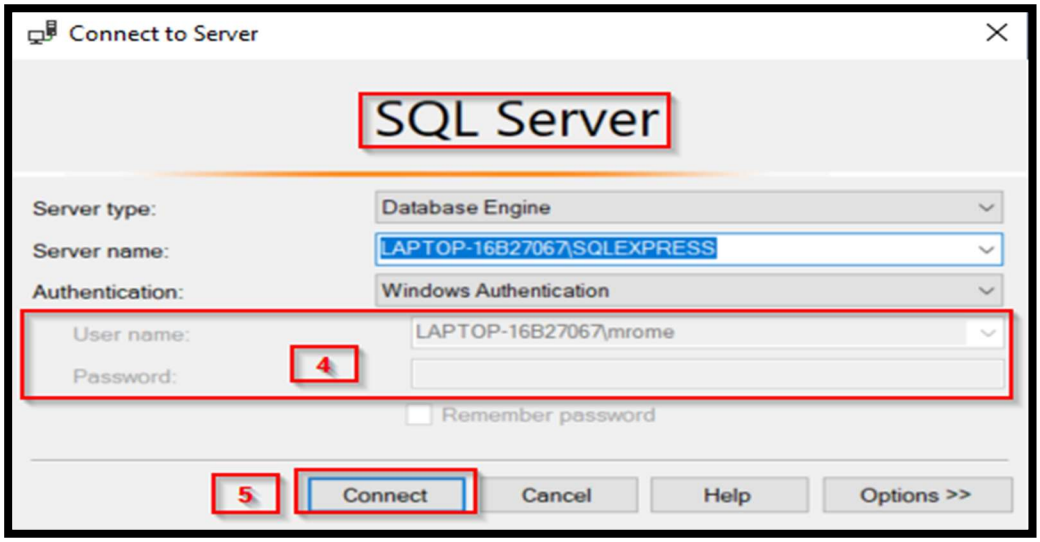
Connect SSMS with Azure

The assumption is that the client will host the "WeVote" in the Microsoft Azure cloud environment. For that, the client must set up the connection of SSMS on the Azure side. Once that is completed, a connection string with the username and password and server name on it would be created. Finally, these steps can be followed to connect SSMS with Azure.

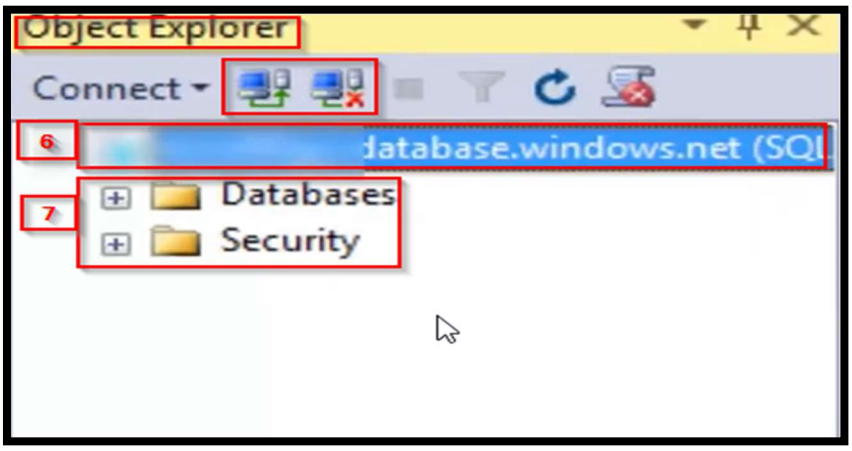
1) Open SSMS to login.
2) From the connection string, copy the server name (that is created while setting up the connection in Azure) into Server Name of the SQL server login screen.
3) For Authentication, choose SQL Server Authentication from the drop-down list.



4) Put username and password from the connection screen.
5) Click connect.



6) This will connect to the server and show the server name in Object Explorer.
7) In few seconds, the Database and Security tab will fill out.
8) Now you are connected to your Azure database from SSMS.



References

(2021, 1 10). Retrieved from Microsoft: https://docs.microsoft.com/en-us/sql/relational-databases/backup-restore/create-a-differential-database-backup-sql-server?view=sql-server-ver15