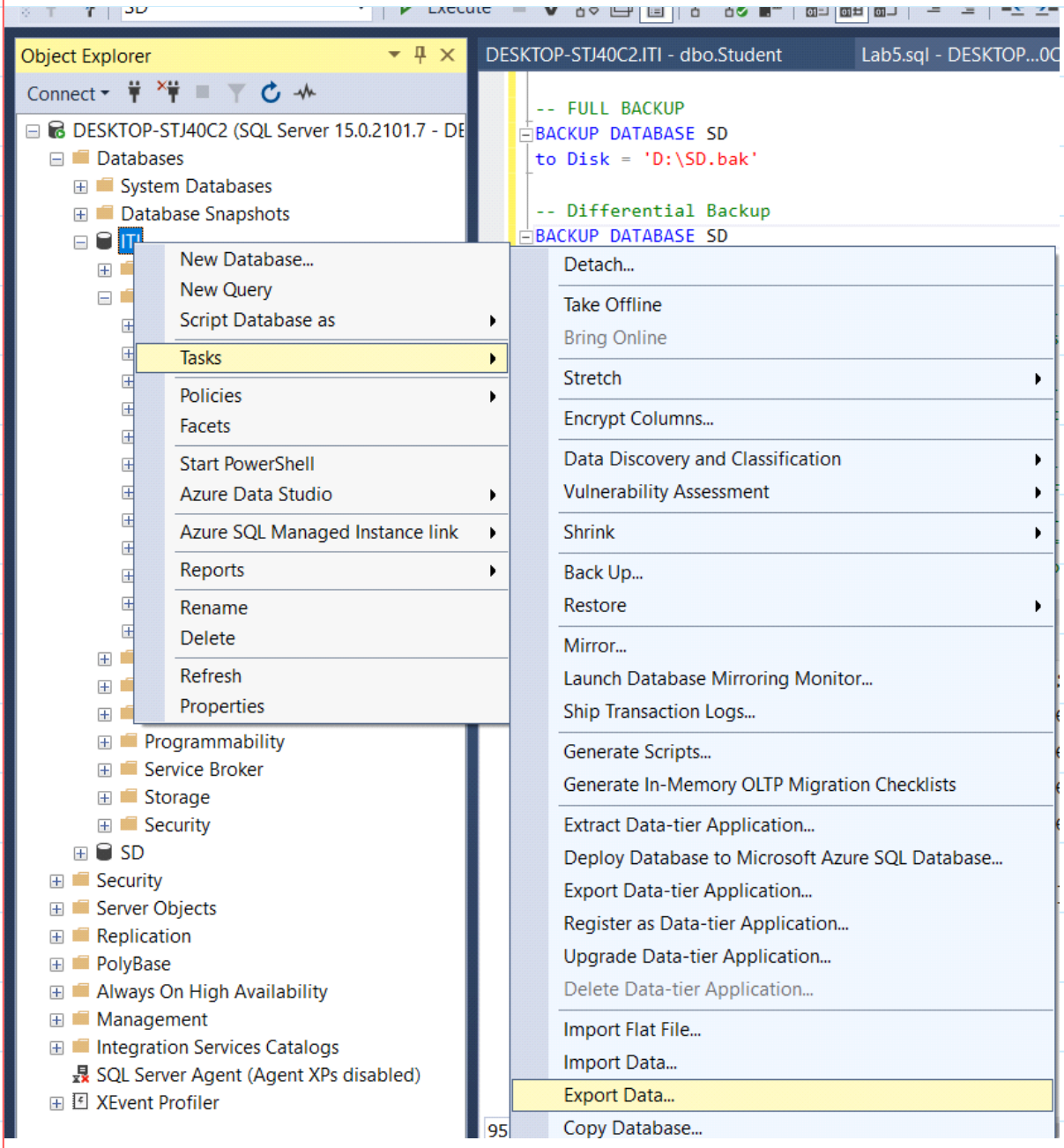
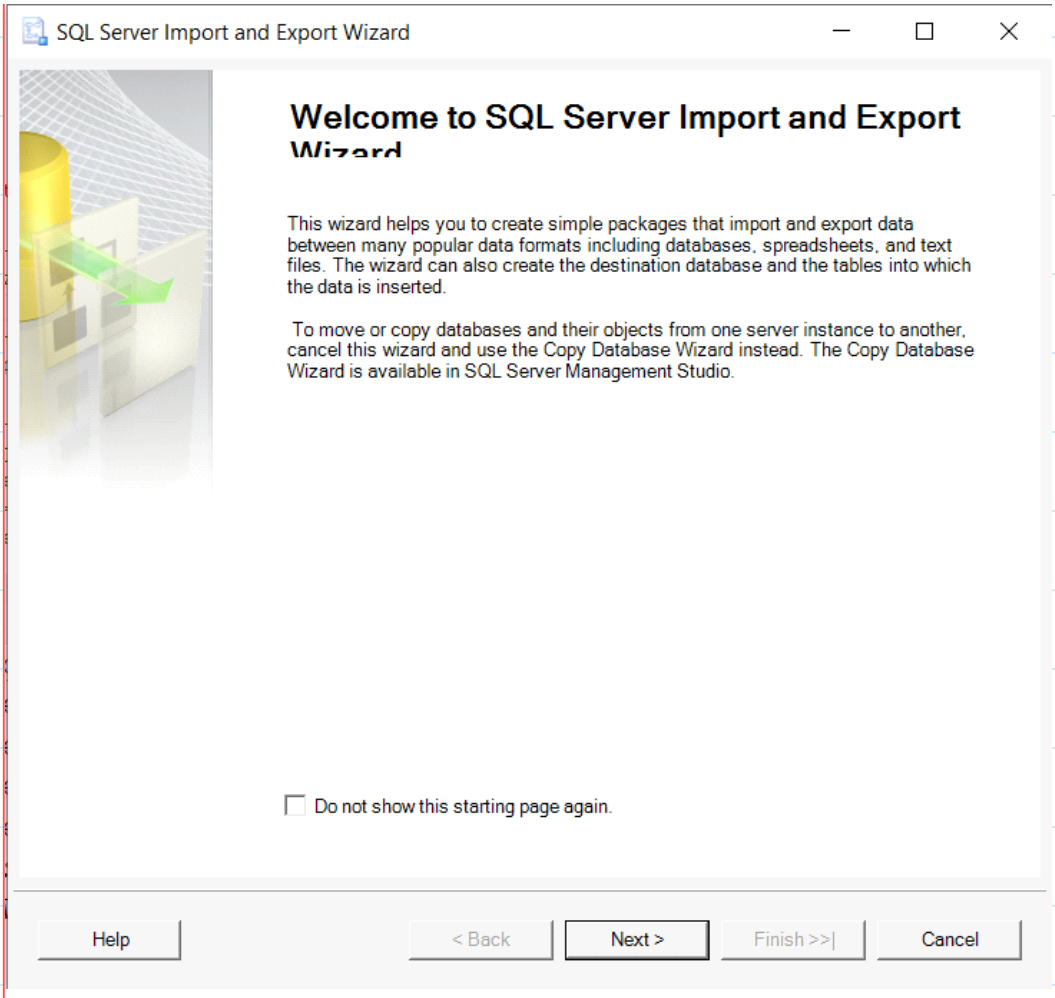
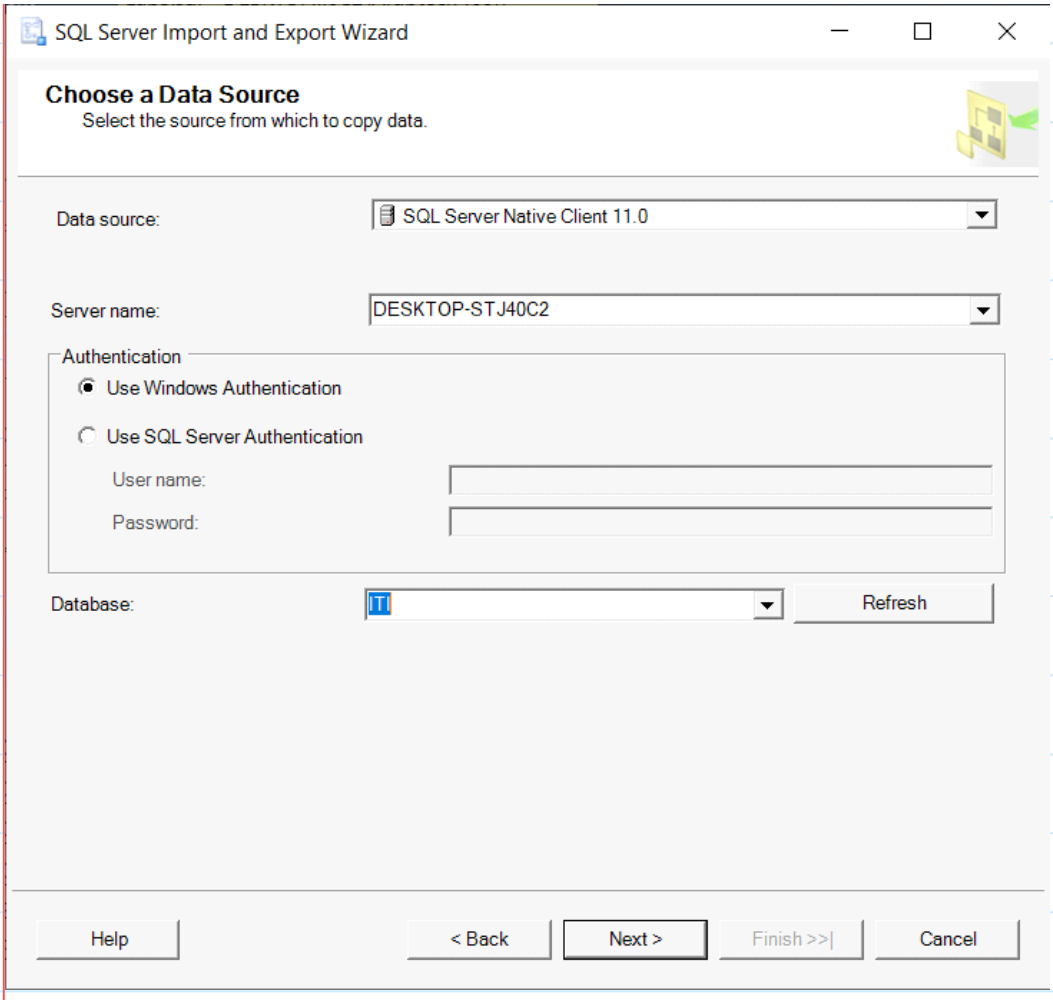
Part 1 Point 5

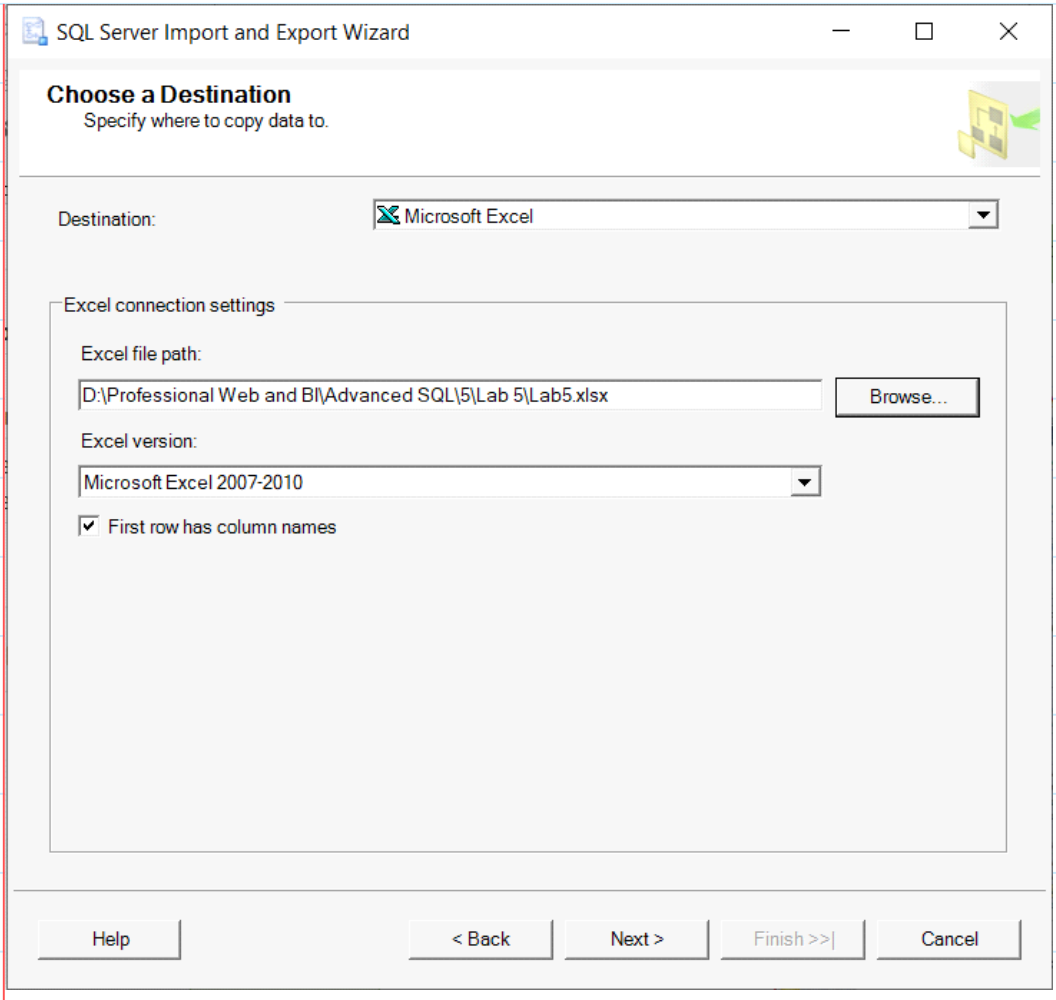
Friday, February 24, 2023 5:07 PM

5. Use import export wizard to display students data (ITI DB) in excel sheet




SQL Server Import and Export Wizard
Welcome to SQL Server Import and Export Wizard
This wizard helps you to create simple packages that import and export data between many popular data formats including databases, spreadsheets, and text files. The wizard can also create the destination database and the tables into which the data is inserted.
To move or copy databases and their objects from one server instance to another, cancel this wizard and use the Copy Database Wizard instead. The Copy Database Wizard is available in SQL Server Management Studio.
Do not show this starting page again.
Help
< Back
Next >
Finish >>|
Cancel


SQL Server Import and Export Wizard
Choose a Data Source
Select the source from which to copy data.
Data source:
SQL Server Native Client 11.0
Server name:
DESKTOP-STJ40C2
Authentication
Use Windows Authentication
Use SQL Server Authentication
User name:
Password:
Database:
ITI
Refresh
Help
< Back
Next >
Finish >>|
Cancel

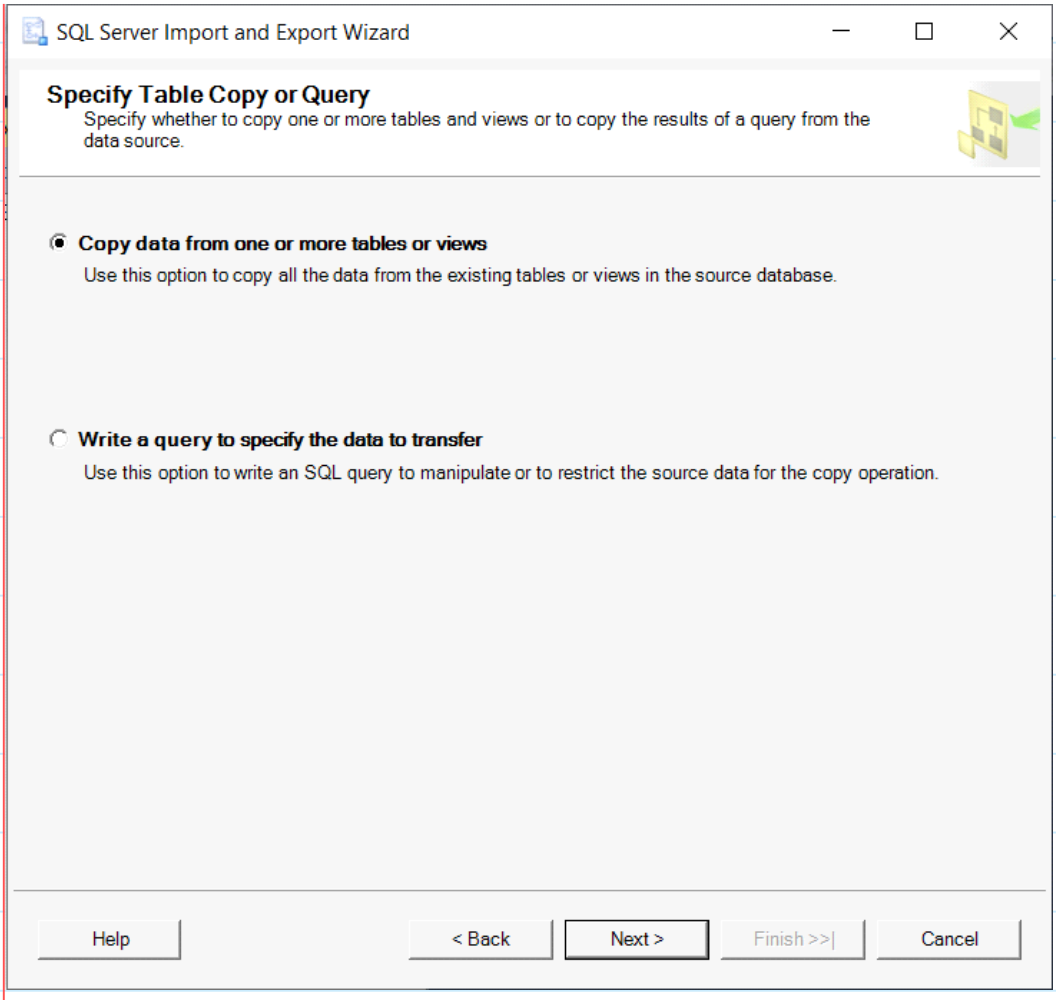


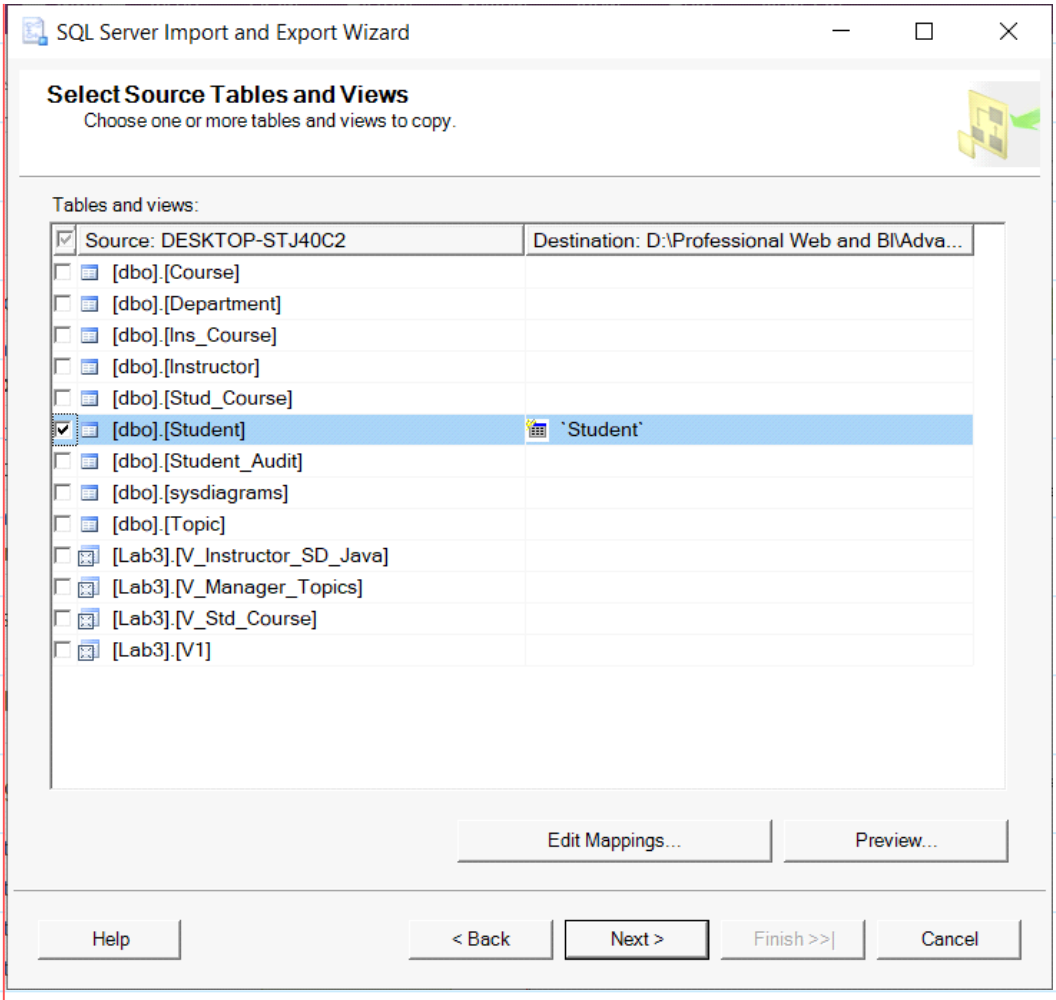
You have to download Access Database Engine

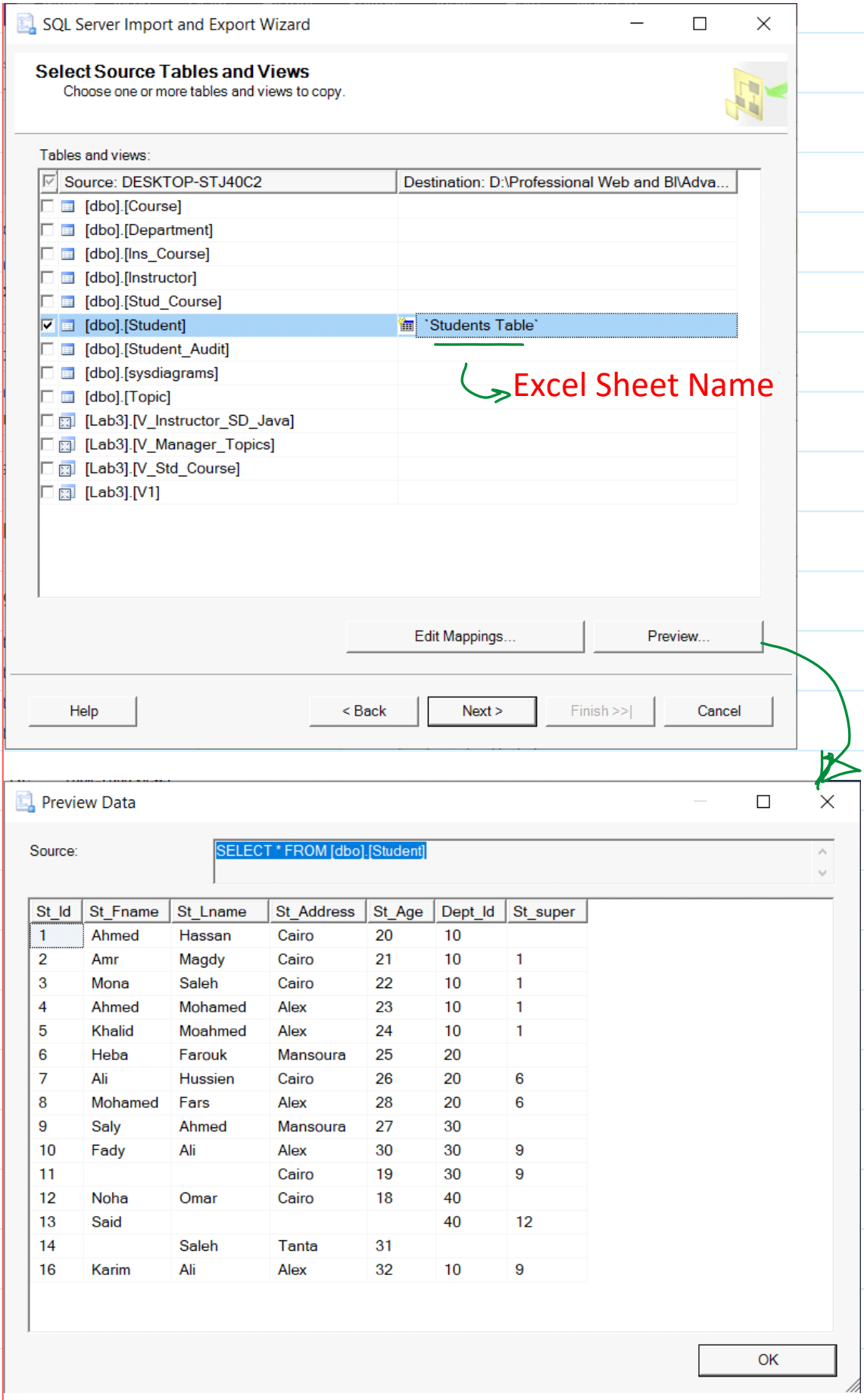
https://www.microsoft.com/en-us/download/confirmation.aspx?id=13255

https://www.microsoft.com/en-us/download/details.aspx?id=54920

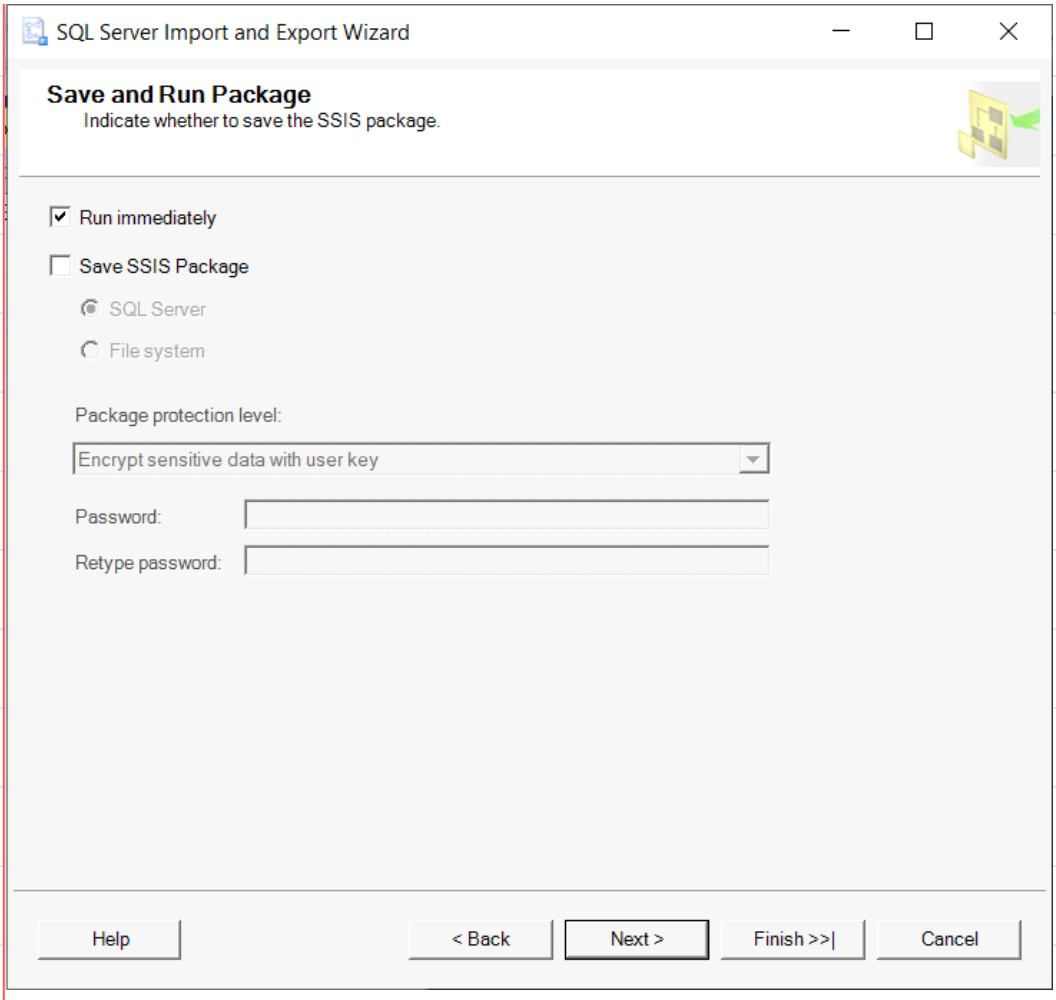
https://www.sqlshack.com/import-data-excel-file-sql-server-database/

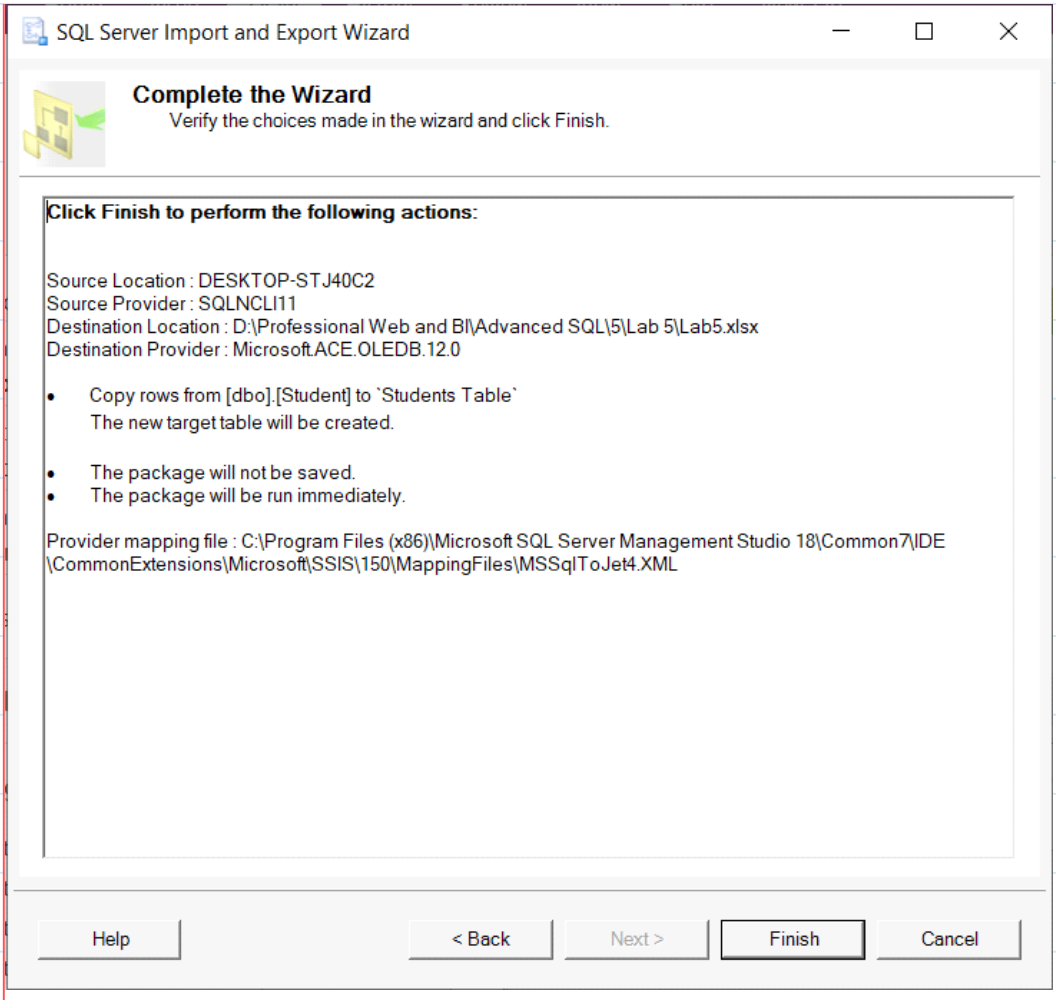

SQL Server Import and Export Wizard
Specify Table Copy or Query
Specify whether to copy one or more tables and views or to copy the results of a query from the data source.
Copy data from one or more tables or views
Use this option to copy all the data from the existing tables or views in the source database.
Write a query to specify the data to transfer
Use this option to write an SQL query to manipulate or to restrict the source data for the copy operation.
Help
< Back
Next >
Finish >>|
Cancel

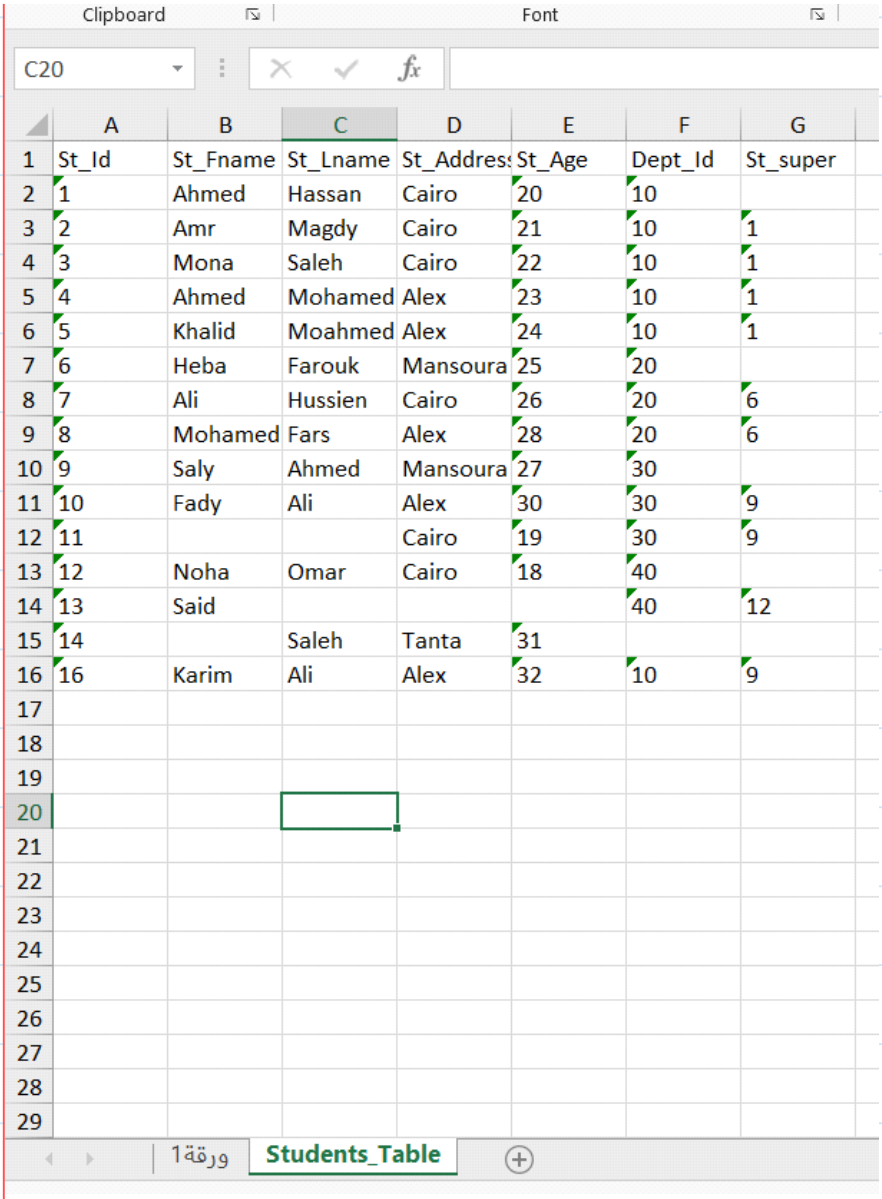

SQL Server Import and Export Wizard
Select Source Tables and Views
Choose one or more tables and views to copy.
Tables and views:
Source: DESKTOP-STJ40C2
Destination: D:\Professional Web and BI\Adva...
[dbo].[Course]
[dbo].[Department]
[dbo].[Ins_Course]
[dbo].[Instructor]
[dbo].[Stud_Course]
[dbo].[Student]
`Student`
[dbo].[Student_Audit]
[dbo].[sysdiagrams]
[dbo].[Topic]
[Lab3].[V_Instructor_SD_Java]
[Lab3].[V_Manager_Topics]
[Lab3].[V_Std_Course]
[Lab3].[V1]
Edit Mappings...
Preview...
Help
< Back
Next >
Finish >>|
Cancel



St_Id	St_Fname	St_Lname	St_Address	St_Age	Dept_Id	St_super
1	Ahmed	Hassan	Cairo	20	10	
2	Amr	Magdy	Cairo	21	10	1
3	Mona	Saleh	Cairo	22	10	1
4	Ahmed	Mohamed	Alex	23	10	1
5	Khalid	Moahmed	Alex	24	10	1
6	Heba	Farouk	Mansoura	25	20	
7	Ali	Hussien	Cairo	26	20	6
8	Mohamed	Fars	Alex	28	20	6
9	Saly	Ahmed	Mansoura	27	30	
10	Fady	Ali	Alex	30	30	9
11			Cairo	19	30	9
12	Noha	Omar	Cairo	18	40	
13	Said				40	12
14		Saleh	Tanta	31		
16	Karim	Ali	Alex	32	10	9


SQL Server Import and Export Wizard
Save and Run Package
Indicate whether to save the SSIS package.
Run immediately
Save SSIS Package
SQL Server
File system
Package protection level:
Encrypt sensitive data with user key
Password:
Retype password:
Help
< Back
Next >
Finish >>|
Cancel


SQL Server Import and Export Wizard
Complete the Wizard
Verify the choices made in the wizard and click Finish.
Click Finish to perform the following actions:
Source Location : DESKTOP-STJ40C2
Source Provider : SQLNCLI11
Destination Location : D:\Professional Web and BI\Advanced SQL\5\Lab 5\Lab5.xlsx
Destination Provider : Microsoft.ACE.OLEDB.12.0
Copy rows from [dbo].[Student] to `Students Table`
The new target table will be created.
The package will not be saved.
The package will be run immediately.
Provider mapping file : C:\Program Files (x86)\Microsoft SQL Server Management Studio 18\Common7\IDE
\CommonExtensions\Microsoft\SSIS\150\MappingFiles\MSSqlToJet4.XML
Help
< Back
Next >
Finish
Cancel


Clipboard
Font
C20
A B C D E F G
1 St_Id St_Fname St_Lname St_Address St_Age Dept_Id St_super
2 1 Ahmed Hassan Cairo 20 10
3 2 Amr Magdy Cairo 21 10 1
4 3 Mona Saleh Cairo 22 10 1
5 4 Ahmed Mohamed Alex 23 10 1
6 5 Khalid Moahmed Alex 24 10 1
7 6 Heba Farouk Mansoura 25 20
8 7 Ali Hussien Cairo 26 20 6
9 8 Mohamed Fars Alex 28 20 6
10 9 Saly Ahmed Mansoura 27 30
11 10 Fady Ali Alex 30 30 9
12 11 Cairo 19 30 9
13 12 Noha Omar Cairo 18 40
14 13 Said 40 12
15 14 Saleh Tanta 31
16 16 Karim Ali Alex 32 10 9
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ورقة1
Students_Table

Part 1 Point 6

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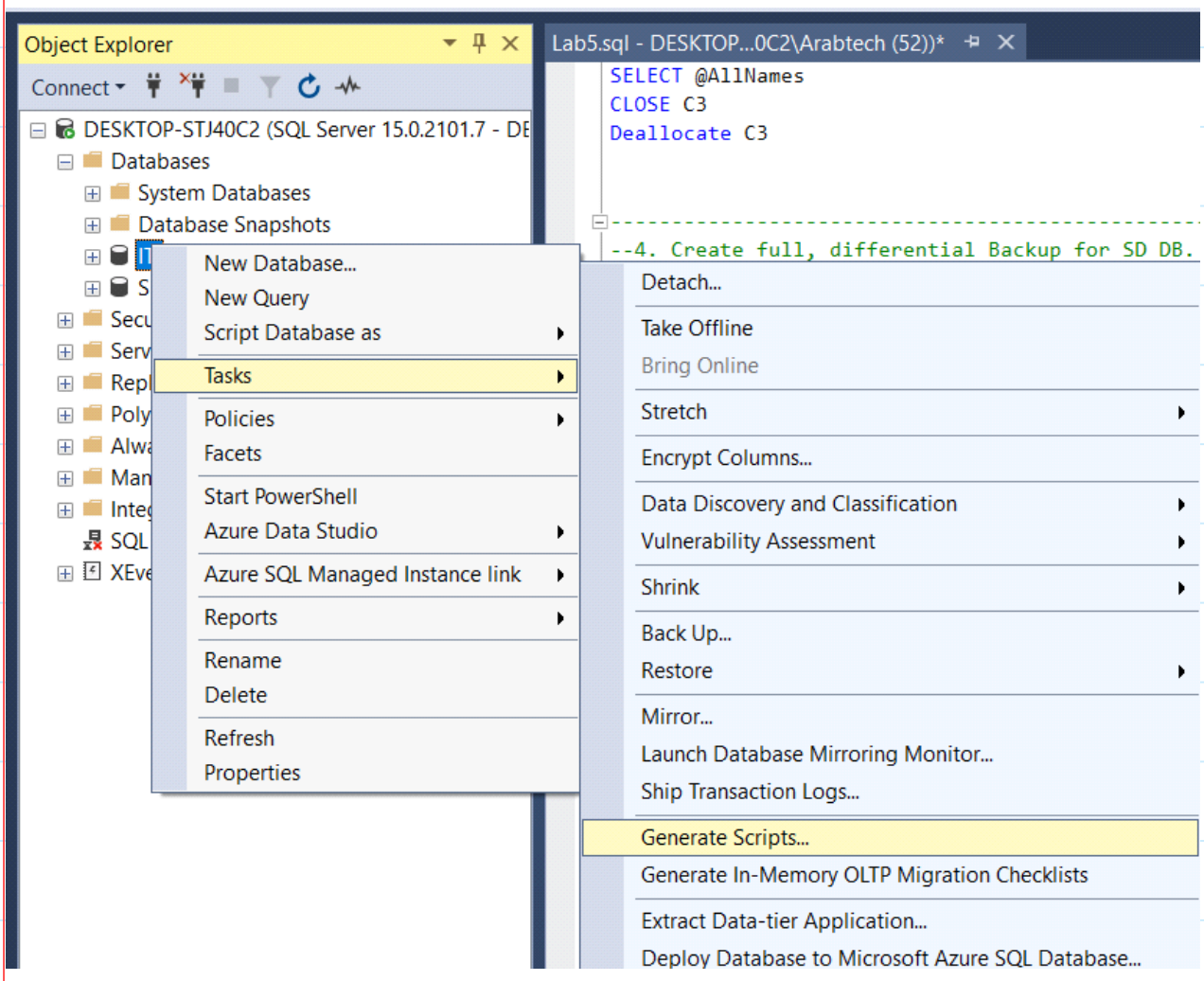
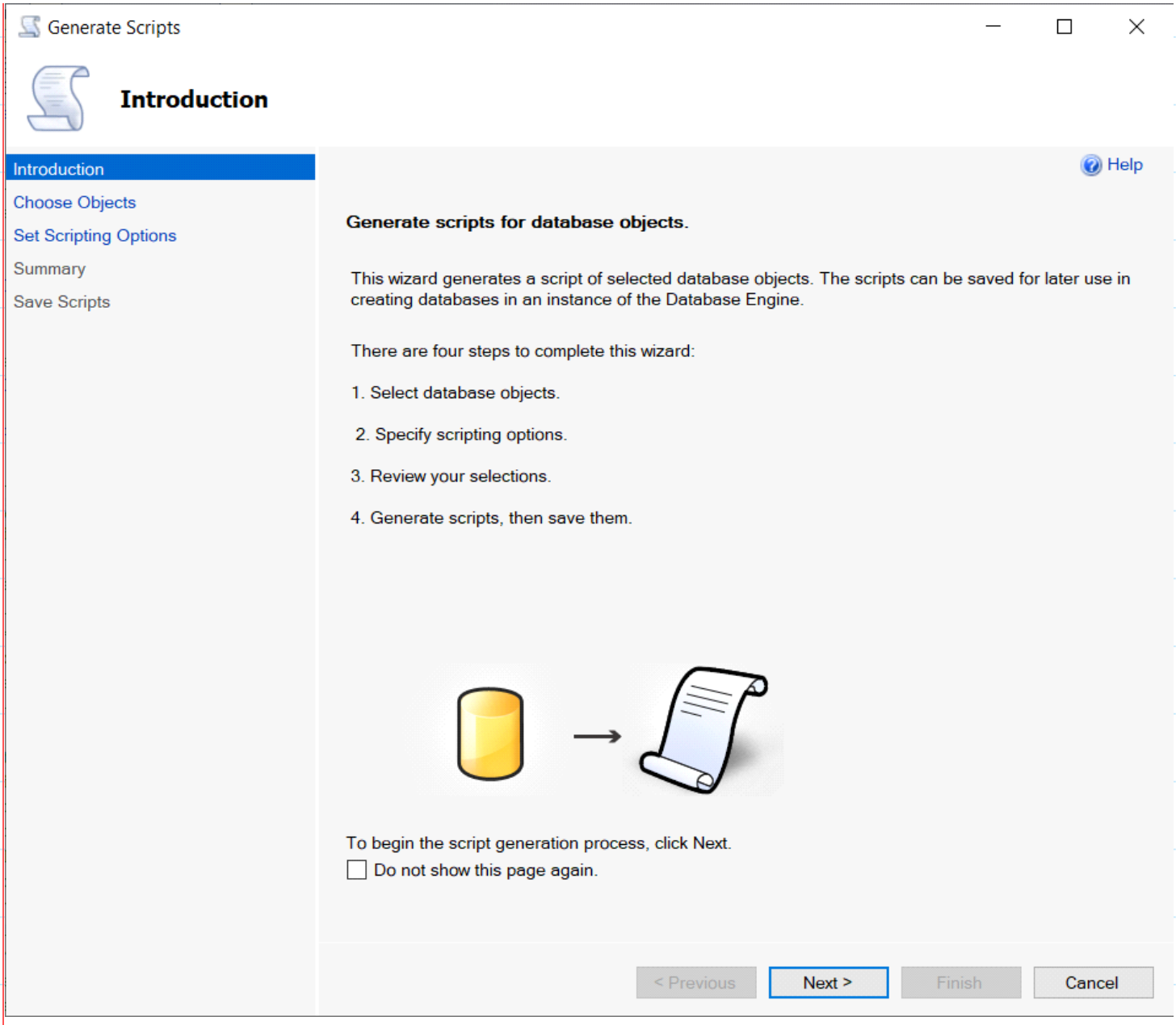
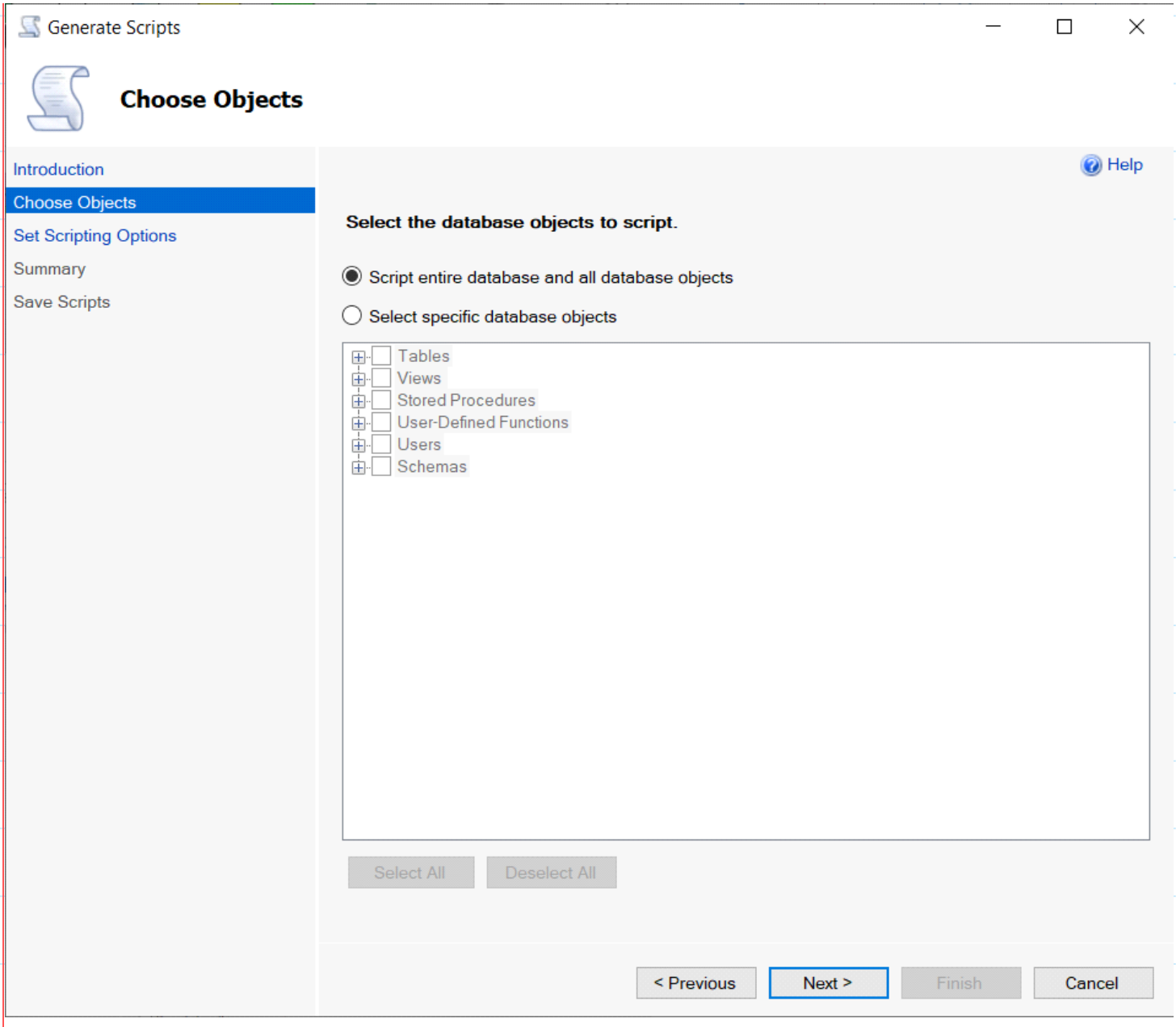
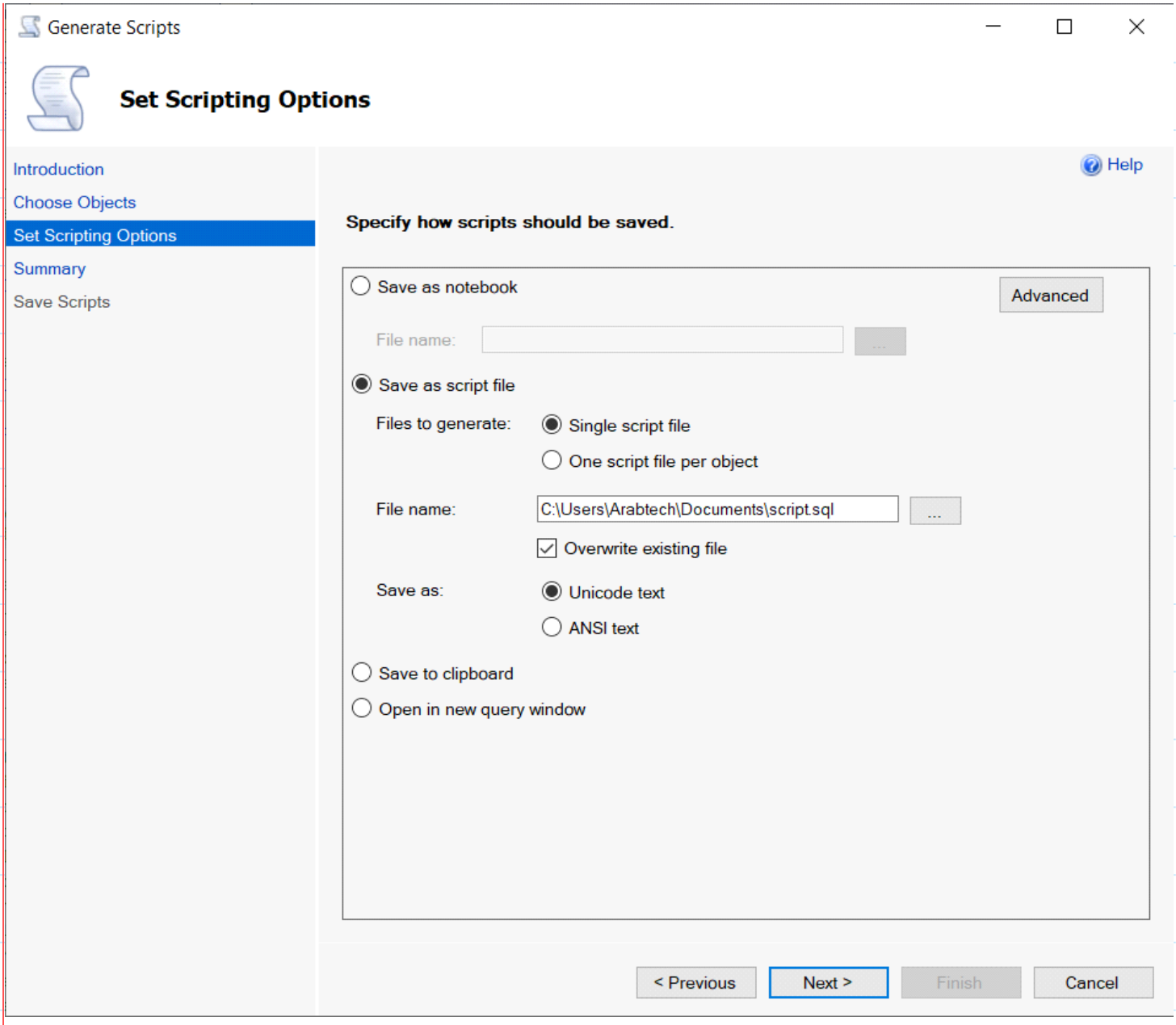
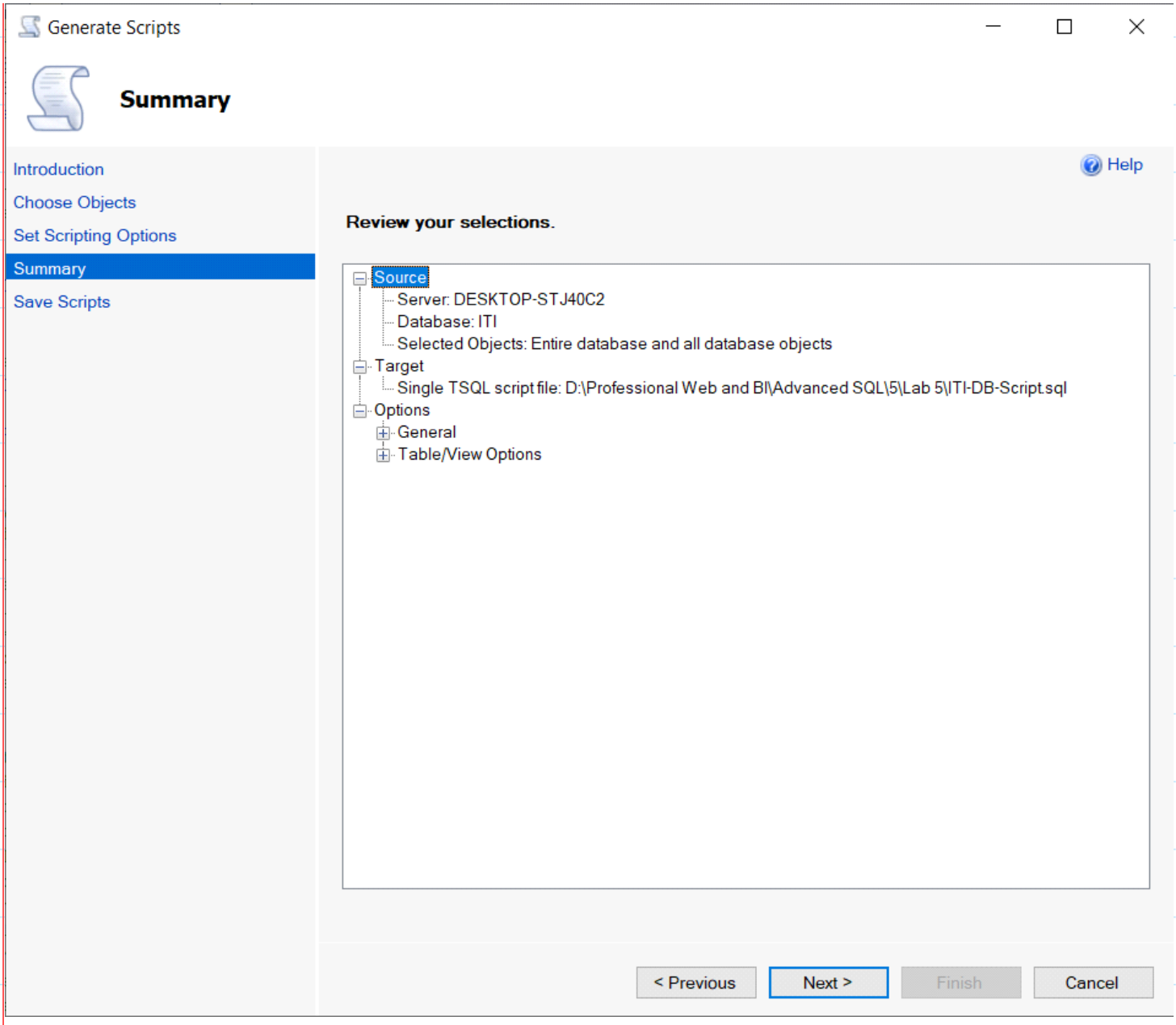
6. Try to generate script from DB ITI that describes all tables and views in this DB

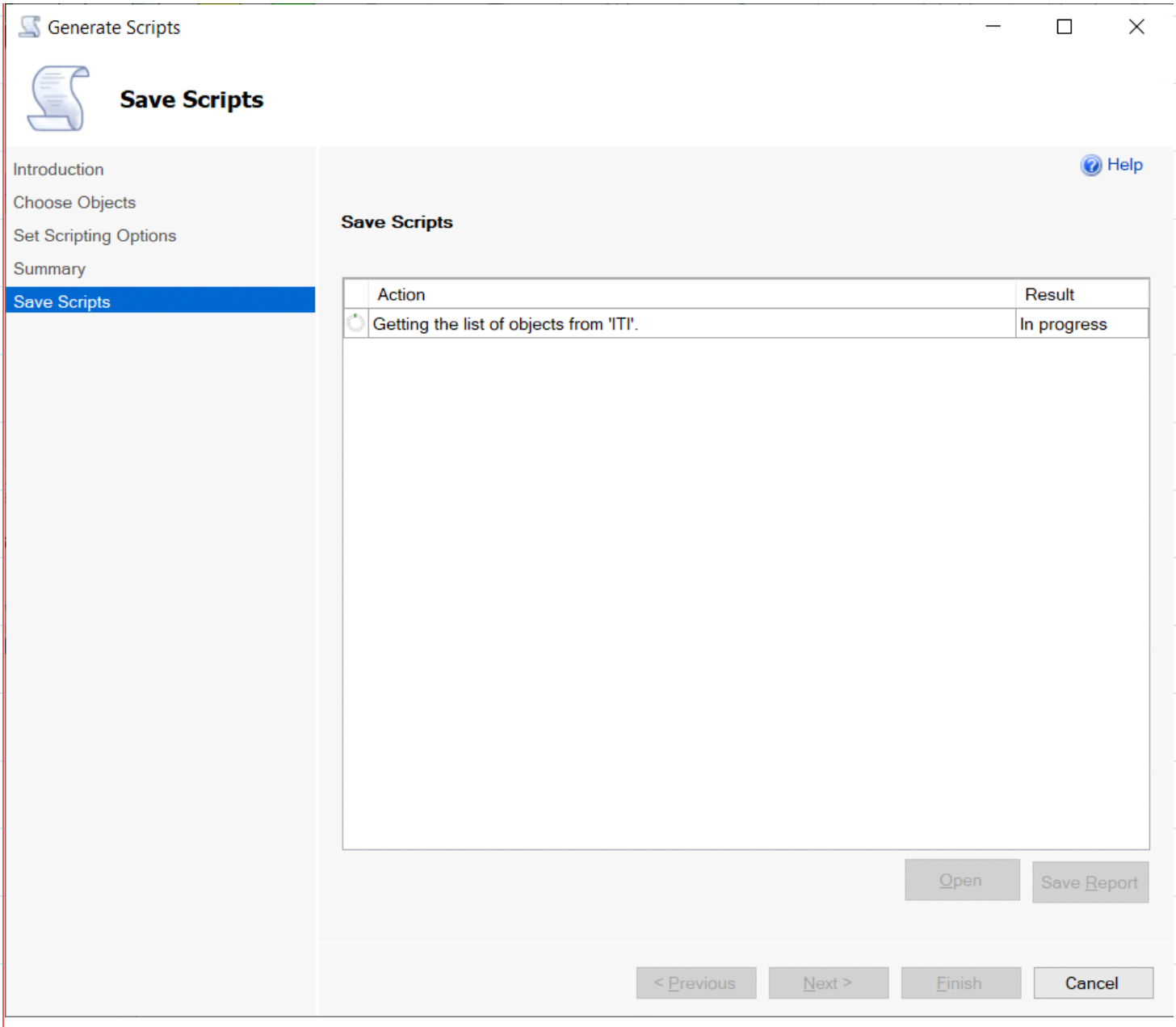



Generate Scripts
Introduction
Introduction
Choose Objects
Set Scripting Options
Summary
Save Scripts
Help
Generate scripts for database objects.
This wizard generates a script of selected database objects. The scripts can be saved for later use in creating databases in an instance of the Database Engine.
There are four steps to complete this wizard:
1. Select database objects.
2. Specify scripting options.
3. Review your selections.
4. Generate scripts, then save them.
To begin the script generation process, click Next.
Do not show this page again.
< Previous
Next >
Finish
Cancel


Generate Scripts
Choose Objects
Introduction
Choose Objects
Set Scripting Options
Summary
Save Scripts
Help
Select the database objects to script.
Script entire database and all database objects
Select specific database objects
Tables
Views
Stored Procedures
User-Defined Functions
Users
Schemas
Select All
Deselect All
< Previous
Next >
Finish
Cancel


Generate Scripts
Set Scripting Options
Introduction
Choose Objects
Set Scripting Options
Summary
Save Scripts
Help
Specify how scripts should be saved.
Save as notebook
Advanced
File name:
Save as script file
Files to generate:
Single script file
One script file per object
File name:
C:\Users\Arabtech\Documents\script.sql
Overwrite existing file
Save as:
Unicode text
ANSI text
Save to clipboard
Open in new query window
< Previous
Next >
Finish
Cancel


Generate Scripts
Summary
Introduction
Choose Objects
Set Scripting Options
Summary
Save Scripts
Help
Review your selections.
Source
Server: DESKTOP-STJ40C2
Database: ITI
Selected Objects: Entire database and all database objects
Target
Single TSQL script file: D:\Professional Web and BI\Advanced SQL\5\Lab 5\ITI-DB-Script.sql
Options
General
Table/View Options
< Previous
Next >
Finish
Cancel


Generate Scripts
Save Scripts
Introduction
Choose Objects
Set Scripting Options
Summary
Save Scripts
Help
Save Scripts
Action
Result
Getting the list of objects from 'ITI'.
In progress
Open
Save Report
< Previous
Next >
Finish
Cancel

Part2

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Part2: What is the difference between the following objects in SQL Server

---

1. batch, script and transaction

① Batch

a group of two or more separate SQL Statements

Go is the default batch separator for T-SQL

if one statement goes through an Error ⇒ The Rest of Statements are executed Properly.

② Script

scripting in T-SQL is used to deel with Database objects

✓ Queries ✓ Databases ✓ Tables

✓ Stored Procedures ✓ Extended Events

③ Transaction

a transaction is a sequential group of SQL Statemens

- in case all modification is Successfull when the transaction is Committed
- in case all modification are undone when the transaction is rollback

2. trigger and stored procedure

Trigger	Stored Procedure
① run automatically when certain events happen	① written to do some specific task

① run automatically when certain events happen	① written to do some specific task
② execute automatically based on events	② can be invoked explicitly by the user
③ cannot take a parameter	③ can take a parameter
④ cannot return values	④ can return values

3. stored procedure and functions

Stored Procedures	Functions
① can return zero, single or multiple values	① always return a single value → scalar, → table
② only Select Statements → DML Statements are not allowed	② can perform any operation on database objects

4. drop, truncate and delete statement

drop → DDL
- → deletes the defined table with all table data
- → drops the table from the database

delete → DML
- → deletes existing records from the table according to the condition given

Truncate → DDL
- → used to delete the complete

⇒ used to delete the complete records from an existing table

5. select and select into statement

Select select specific rows from a table

Select into creates a new table and puts the data in it

Part2

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6. local and global variables

- Local variables are created when the function has started execution and is lost when the function terminates.
- A Global variable is created as execution starts and is lost when the program ends.
- The local variable doesn't provide data sharing, whereas the Global variable provides data sharing.

7. convert and cast statements

- Cast Function
  can convert an expression to the provided datatype. In short, it is used to convert one data type to another data-type.

  CAST(expression AS datatype [(length)])

  Or

  CAST(source-column-name AS target-datatype[(length-optional)])

1. **Expression**: It is the required part and it means value to convert.
2. **Datatype**: This is also must be required and using this means you want to convert expression value to this datatype.
3. **Length**: when you see anything in the bracket as per Microsoft guideline it is optional means if you want to provide then write else we are ok with not provide anything for this.

- Convert Function
  convert the value of any type into a given or specified data-type.

  CONVERT(data_type(length), expression, style)

- **Data-type**: It is a required field and it will convert your expression i.e value of some data-type to your mentioned data-type.
- **Length**:- it optional parameter.
- **Expression**:- It is an actual value to convert another data-type.
- **Style**:- This optional parameter is used if you want to format data as per your need you can use this style option.

8. DDL,DML,DCL,DQL and TCL

1. Data Definition Language (DDL)

- DDL changes the structure of the table like creating a table, deleting a table, altering a table, etc.
- All the command of DDL are auto-committed that means it permanently save all the changes in the database.

- CREATE
- ALTER
- DROP
- TRUNCATE

2. Data Manipulation Language

- DML commands are used to modify the database. It is responsible for all form of changes in the database.
- The command of DML is not auto-committed that means it can't permanently save all the changes in the database. They can be rollback.

- INSERT
- UPDATE
- DELETE

3. Data Control Language

DCL commands are used to grant and take back authority from any database user.

- Grant
- Revoke

a. Grant: It is used to give user access privileges to a database.

b. Revoke: It is used to take back permissions from the user.

9. For xml raw and for xml auto

XML clause can use to convert existing data to XML format. It can also be used to join or concatenate multiple columns into a single row.
FOR XML Clause has below 4 Modes, that decide the shape of the XML – result.

- RAW
- AUTO
- EXPLICIT
- PATH

AUTO MODE With FOR XML

FOR XML AUTO and FOR XML PATH are the simplest ways to convert SQL data into XML. In the below example, we will discuss FOR XML AUTO Clause.

10. Table valued and multi statement function

- Inline Table Valued Function
  a. You simply state `RETURNS TABLE` and the return table's definition will be based on the function's `SELECT` statement. No need to specify the structure of the return table.
  b. ITVFs do not use the `BEGIN`/`END` syntax.

- Multi Statement Function

a. Your `RETURNS` syntax explicitly specifies the structure of the return table. This is done by declaring a TABLE variable that will be used to store and accumulate the rows that are returned as the value of the function.
b. ITVFs do use the `BEGIN`/`END` syntax.

Part2

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11. Varchar(50) and varchar(max)

varchar means character data that is varying. Also known as Variable Character, it is an indeterminate length string data type. It can hold numbers, letters and special characters.
SQL varchar usually holds 1 byte per character and 2 more bytes for the length information. It is recommended to use varchar as the data type when columns have variable length and the actual data is way less than the given capacity. varchar(n) is used to store variable length value as a string, here 'n' denotes the string length in bytes and it can go up to 8000 characters.

SQL Server 2005 got around this limitation of 8KB storage size and provided a workaround with varchar(max). It is a non-Unicode large variable-length character data type and can store a maximum of 2^31-1 bytes (2 GB) of non-Unicode characters.
One limitation of using varchar(max) is we cannot create an index that has a varchar(max) as a key column, instead, it is advisable to do a Full-text index on that column
https://www.sqlshack.com/sql-varchar-data-type-deep-dive/
https://www.sqlshack.com/varcharmax-data-type-walkthrough-and-its-comparison-with-varcharn-in-sql-server/

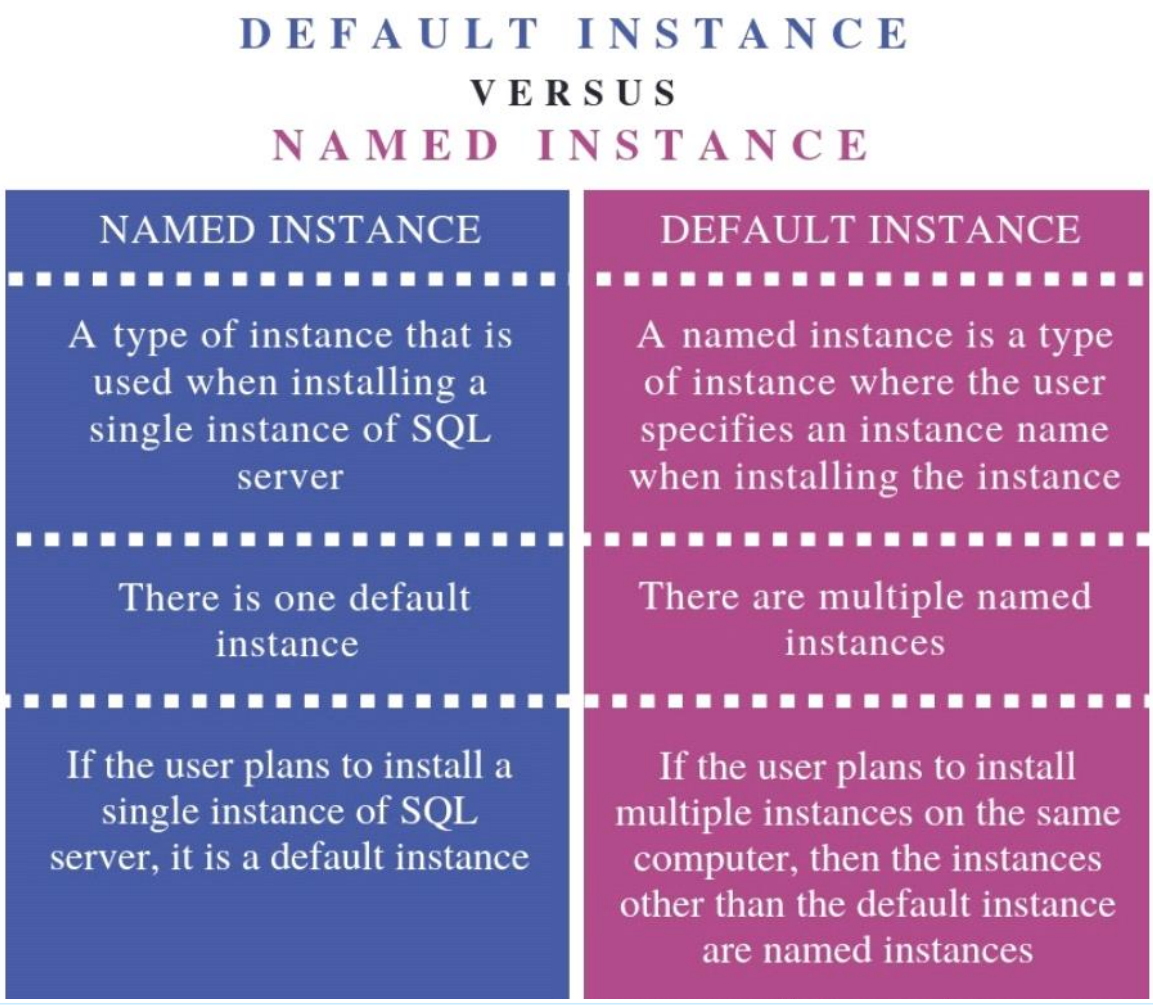
12. Datetime, datetime2(7) and datetimeoffset(7)

Property	DateTime	DateTime2
Syntax	DateTime	DateTime2[(n)] where n is fractional seconds precision from 0 to 7
Format	YYYY-MM-DD hh:mm:ss.nnn	YYYY-MM-DD hh:mm:ss[.n]
Date range	January 1, 1753, through December 31, 9999	through 9999-12-31
Time range	00:00:00 through 23:59:59.997	00:00:00 through 23:59:59.9999999
Usage	DECLARE @MyDatetime datetime	DECLARE @MyDatetime2 datetime2(7)
Fractional seconds range	Zero to three digits, ranging from 0 to 999 represents the fractional seconds.	Zero- to seven-digit number from 0 to 9999999 represents the fractional seconds
Accuracy	Rounded to increments of .000, .003, or .007 seconds	100 nanoseconds
Default value	1900-01-01 00:00:00	1900-01-01 00:00:00
Character length	19 positions minimum to 23 maximum	19 positions minimum to 27 maximum
User-defined fractional second precision	No	Yes
Storage size	8 bytes	6 bytes for precision less than 3.
ANSI and ISO 8601	No	Yes

Feature	datetimeoffset	datetime2
SQL Compliant (ANSI & ISO 8601)	Yes	Yes
Date Range	0001-01-01 through 9999-12-31	0001-01-01 through 9999-12-31
Time Range	00:00:00 through 23:59:59.9999999	00:00:00 through 23:59:59.9999999
Character Length	26 positions minimum 34 maximum	19 positions minimum 27 maximum
Storage Size	8 to 10 bytes, depending on the precision* * Plus 1 byte to store the precision	6 to 8 bytes, depending on the precision* * Plus 1 byte to store the precision
Accuracy	100 nanoseconds	100 nanoseconds
Fractional second precision	Yes	Yes
User-defined fractional second precision	Yes	Yes
Time zone offset range	-14:00 through +14:00	None
Time zone offset aware and preservation	Yes	No
Daylight saving aware	No	No

13. Default instance and named instance

The main difference between default instance and named instance in SQL server is that a SQL server can have only one default instance, but it can have multiple named instances.



https://pediaa.com/what-is-the-difference-between-default-instance-and-named-instance-in-sql-server/

14. SQL and windows Authentication

When a user connects through a Windows user account, SQL Server validates the account name and password using the Windows principal token in the operating system. This means that the user identity is confirmed by Windows. SQL Server does not ask for the password, and does not perform the identity validation.

When using SQL Server Authentication, logins are created in SQL Server that aren't based on Windows user accounts. Both the user name and the password are created by using SQL Server and stored in SQL Server. Users connecting using SQL Server Authentication must provide their credentials (login and password) every time that they connect

https://learn.microsoft.com/en-us/sql/relational-databases/security/choose-an-

authentication-mode?view=sql-server-ver16

15. Clustered and non-clustered index

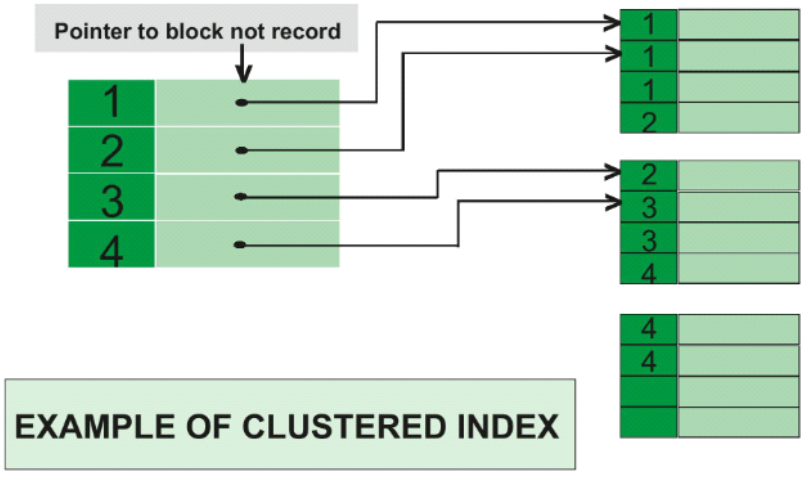
1. Clustered Index :

Clustered index is created only when both the following conditions satisfy –

- The data or file, that you are moving into secondary memory should be in sequential or sorted order.
- There should be a key value, meaning it can not have repeated values.

Whenever you apply clustered indexing in a table, it will perform sorting in that table only. You can create only one clustered index in a table like primary key. Clustered index is as same as dictionary where the data is arranged by alphabetical order.

In clustered index, index contains pointer to block but not direct data.

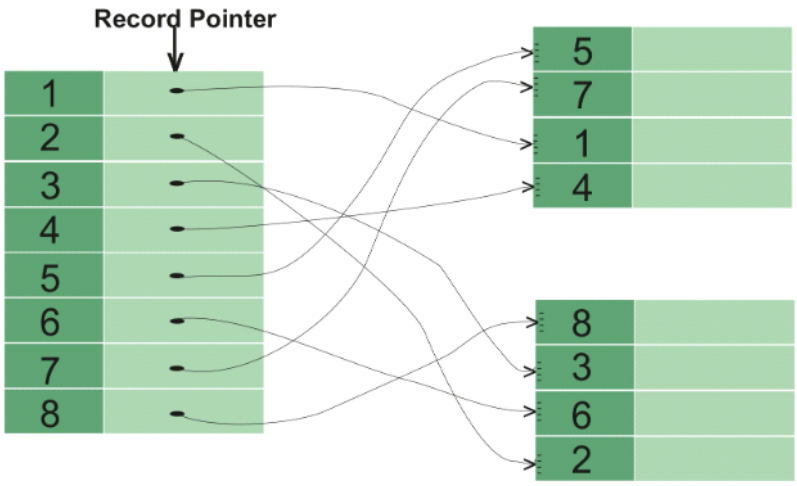


2. Non-clustered Index :

Non-Clustered Index is similar to the index of a book. The index of a book consists of a chapter name and page number, if you want to read any topic or chapter then you can directly go to that page by using index of that book. No need to go through each and every page of a book.

The data is stored in one place, and index is stored in another place. Since, the data and non-clustered index is stored separately, then you can have multiple non-clustered index in a table.

In non-clustered index, index contains the pointer to data.



EXAMPLE OF NON-CLUSTERED INDEX

https://www.geeksforgeeks.org/difference-between-clustered-and-non-clustered-index/

Part2

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16. Group by rollup and group by cube

- The GROUP BY clause is used to group the results of aggregate functions according to a specified column.
- The GROUP BY clause doesn't perform aggregate operations on multiple levels of a hierarchy.
- For example, you can calculate the total of all employee salaries for each department in a company (one level of hierarchy) but you cannot calculate the total salary of all employees regardless of the department they work in (two levels of hierarchy).
- ROLLUP operators let you extend the functionality of GROUP BY clauses by calculating subtotals and grand totals for a set of columns.
- The CUBE operator is similar in functionality to the ROLLUP operator;
- the CUBE operator can calculate subtotals and grand totals for all permutations of the columns specified in it.

17. Sequence object and identity

1.
- The Identity property is a column property meaning it is tied to the table,
- the sequence is a user-defined database object and it is not tied to any specific table meaning its value can be shared by multiple tables.

2.
- To generate the next IDENTITY value, a new row has to be inserted into the table.
- The next VALUE for a SEQUENCE object can simply be generated using the NEXT VALUE FOR clause with the sequence object.

3.
- The value for the IDENTITY property cannot be reset to its initial value.
- The value for the SEQUENCE object can be reset.

4.
- A maximum value cannot be set for the IDENTITY property. On the other hand,
- the maximum value for a SEQUENCE object can be defined.

18. Inline function and view

a) View can be materialized (indexed view) and hence performs better. But Inline Table Valued functions cannot be indexed and performance decreases when number of rows increases.

b) Views can have triggers since they can be used to change underlying tables (INSTEAD OF triggers) but not Inline Table Valued functions.

c) We can use CROSS APPLY with the Inline Table Valued function but not with a view.

d) Views don't accept parameter but Inline Table Valued function does so.

19. Table variable and temporary table

Temp Table	Table Variable
A Temp table is easy to create and back up data.	Table variable involves effort when you usually create normal tables.
Temp table results can be used by multiple users.	The table variable can be used by the current user only.
The temp table will be stored in the tempdb. It will make network traffic. When you have large data in the temp table then it has to work across the database. A Performance issue will exist.	The table variable will store in the physical memory for some of the data, then later when the size increases it will be moved to the tempdb.
The temp table can do all the DDL operations. It allows for creating the indexes, dropping, altering, etc.	The table variable won't allow doing the DDL operations. But the table variable allows us to create the clustered index only.
Temp table can be used for the current session or global. So that a multiple-user session can utilize the results in the table.	A table variable can be used up to that program. (Stored procedure)
When we do the DML operations with the temp table then it can be rollback or commit the transactions.	Temp variable cannot use the transactions. But we cannot roll back or commit for a table variables.
The function allows us to use the table variable.	Functions cannot use the temp variable. Moreover, we cannot do the DML operation in the functions but using the table variable we can do that.
Where the table variable won't do like that.	The stored procedure will do the recompilation (can't use same execution plan) when we use the temp variable for every subsequent call.

https://www.c-sharpcorner.com/UploadFile/skumaar_mca/difference-between-temp-table-and-table-variable/

20. Row_number() and dense_Rank() function

ROW_NUMBER(): It is a ranking function that assigns a unique number to each row to which it is applied (Rows can be in the partition or all the rows from the result set). It always assigns the 1 to the first row and assigns the next number to the next rows.

When we have multiple rows having the same value on which ranking or order needs to be done then in that case row_number randomly assigns the ranks to these rows.

The basic syntax of the row_number function

```
ROW_NUMBER() OVER (
PARTITION BY COL1,COL2
ORDER BY COL1 DESC|ASC)
```

DENSE_RANK():

A rank function that returns the rank of each row within a result set partition, with no gaps in the ranking values. The rank of a specific row is one plus the number of distinct rank values that come before that specific row.

The basic syntax of the Rank function

```
DENSE_RANK() OVER (
PARTITION BY COL1,COL2
ORDER BY COL1 DESC|ASC)
```