

Tenzin Rabjam
Final Documentation
W01344651
CSIS -3540
Date: 12/2/2018

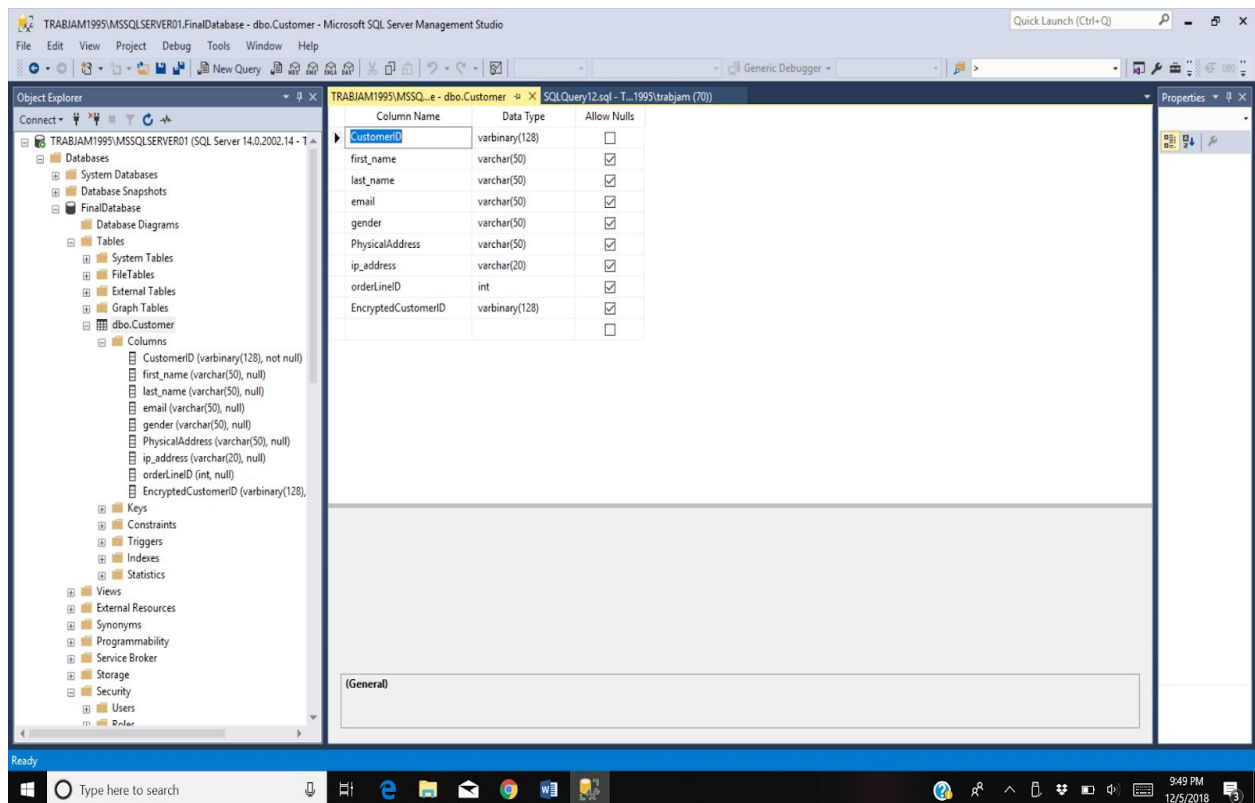
Final Database Documentation

Before concerning on this projects overview, I have sequentially followed the instructions, and at first, I have created a database named Final Database for storing almost a million rows of customer's information. Although I managed to put the real data for all the people until the 100th index. So, then I decided to put random information with the help of mockaroo.

I will elaborate all my efforts and information regarding this project in following steps:

Step 1:

For the first step, I have created a database called Final Database and created a table called customers. I have added following fields called [CustomerID] ,[first_name] ,[last_name] ,[email] ,[gender] ,[PhysicalAddress] ,[ip_address] ,[orderLineID] for the customer's personal information.



Step 2:

Then I have entered some customer's personal information for the test purpose. Then I have added an encrypted column name EncryptedCustomerID.

The screenshot displays the Microsoft SQL Server Management Studio (SSMS) interface. The title bar indicates the active query is 'SQLQuery4.sql - TRABJAM1995\MSSQLSERVER01.FinalDatabase (TRABJAM1995\trabjam (75))'.

The **Object Explorer** on the left shows the database structure, including 'Storage', 'Security', and 'Logins'. The 'Logins' folder is expanded, showing various system and user logins.

The central **SQL Query Editor** contains the following T-SQL script:

```
--GO
--CREATE CERTIFICATE customerIDSecurity
--  WITH SUBJECT = 'CustomerID';
--GO
--;

--ALTER TABLE Customer
--  ADD EncryptedCustomerID int;
--GO

--CREATE SYMMETRIC KEY customerIDKey
--  WITH ALGORITHM = AES_256
--  ENCRYPTION BY CERTIFICATE customerIDSecurity;
--GO

--OPEN SYMMETRIC KEY customerIDKey
--  DECRYPTION BY CERTIFICATE customerIDSecurity;

UPDATE Customer
SET EncryptedCustomerID = EncryptByKey(Key_GUID('customerIDKey'), CustomerID);
GO
```

The **Messages** pane at the bottom shows the execution result: '(576000 rows affected)'.

The **Properties** pane on the right displays connection details for the 'TRABJAM1995\MSSQLSERVER' connection. The 'Aggregate Status' section shows 'Connection failures' with an 'Elapsed time' of '00:00:15.281'. The 'Connection' section shows 'Connection name' as 'TRABJAM1995\MSSQLSERVER'. The 'Connection Details' section shows 'Connection elapsed t' as '00:00:15.281', 'Connection encrypti' as 'Not encrypted', 'Connection finish tin' as '12/5/2018 5:07:18 PM', 'Connection rows ret.' as '0', 'Connection start tim' as '12/5/2018 5:07:03 PM', 'Connection state' as 'Open', 'Display name' as 'TRABJAM1995\MSSQLSERVER', 'Login name' as 'TRABJAM1995\trabjam', 'Server name' as 'TRABJAM1995\MSSQLSERVER', 'Server version' as '14.0.2002', 'Session Tracing ID' as 'SPID', and 'SPID' as '75'.

The status bar at the bottom indicates 'Query executed... TRABJAM1995\MSSQLSERVER01 (... TRABJAM1995\trabjam (75)) FinalDatabase 00:00:15 0 rows'.

SQLQuery6.sql - TRABJAM1995\MSSQLSERVER01\FinalDatabase (TRABJAM1995\trabjam (51))* - Microsoft SQL Server Management Studio

File Edit View Query Project Debug Tools Window Help

Connect ▾

Object Explorer

- TenzinSecretDatabase
- WideWorldImporters
- WideWorldImportersDW
- Security
 - Logins
 - ##MS_PolicyEventProcessingLogin##
 - ##MS_PolicyTsqlExecutionLogin##
 - ##MS_SSIServerCleanupJobLogin##
 - distributor_admin
 - FirstUser
 - FourthUser
 - NT AUTHORITY\SYSTEM
 - NT SERVICE\MSSQLMSSQLSERVER01
 - NT SERVICE\SQLAgent\MSSQLSERVER01
 - NT SERVICE\SQLTELEMETRY\MSSQLSERVER01
 - NT SERVICE\SQLWriter
 - NT SERVICE\Winmgmt
 - sa
 - SecondUser
 - test2
 - ThirdUser
 - TRABJAM1995\trabjam
 - FinalLoginUser1_DataAnalysier
 - FinalLoginUser2_DataDisplay
 - FinalLoginUser3_DataUpdater
 - Server Roles
 - Credentials
 - Cryptographic Providers
 - Audits
 - Server Audit Specifications
 - Server Objects
 - Replication
 - PolyBase
 - Always On High Availability

SQLQuery4.sql - TR...1995\trabjam (75)*

SQLQuery6.sql - TR...1995\trabjam (51)*

/***** Script for SelectTopNRows command from SSMS *****/

```
SELECT *  
FROM [FinalDatabase].[dbo].[Customer]
```

Results

	CustomerID	first_name	last_name	email	gender	PhysicalAddress	ip_address	orderLineID	EncryptedCustomerID
1	0x00000001	Yetie	Ganstan	ygarstan0@addthis.com	Female	5294 Northport Trail	129.36.162.251	20	0x009A0B9B43CF43429289EAF6B5500D540200
2	0x00000002	Margaretta	Abthorpe	matthorpe0@yellowpages.com	Female	3228 Mur Alley	2.149.240.126	83	0x009A0B9B43CF43429289EAF6B5500D540200
3	0x00000003	Robby	Sulley	rsulley1@washingtont.com	Female	7 Gateway Junction	214.33.19.126	36	0x009A0B9B43CF43429289EAF6B5500D540200
4	0x00000004	Aubry	Bletsor	abletsor2@instagram.com	Female	2 Prairieview Point	245.224.175.244	89	0x009A0B9B43CF43429289EAF6B5500D540200
5	0x00000005	Otfand	Ellard	oellard3@pinterest.com	Male	131 Hazelcrest Pass	190.90.195.242	10	0x009A0B9B43CF43429289EAF6B5500D540200
6	0x00000006	Shurlocke	Markwell	smarkwell4@timesonline.co.uk	Male	54257 Shoshone Way	2.55.250.171	3	0x009A0B9B43CF43429289EAF6B5500D540200
7	0x00000007	Archibold	Calder	acalder5@tiny.cc	Male	48305 Harper Point	253.15.223.181	50	0x009A0B9B43CF43429289EAF6B5500D540200
8	0x00000008	Free	Rubica	frubica5@php.net	Male	2 Schurz Hill	19.213.244.36	52	0x009A0B9B43CF43429289EAF6B5500D540200
9	0x00000009	Candice	Lequeux	clequeux7@webeden.co.uk	Female	35 Hazelcrest Way	210.118.22.89	94	0x009A0B9B43CF43429289EAF6B5500D540200
10	0x0000000A	Steward	Sawl	ssawl8@java.com	Male	030 Reinke Trail	255.154.242.178	19	0x009A0B9B43CF43429289EAF6B5500D540200
11	0x0000000B	Shamon	Epine	sepine9@washingtont.com	Female	48 Roth Junction	98.165.42.94	9	0x009A0B9B43CF43429289EAF6B5500D540200
12	0x0000000C	Jordan	Vasiltsov	jvasiltsova@jiggy.com	Female	6443 East Way	209.37.150.64	54	0x009A0B9B43CF43429289EAF6B5500D540200
13	0x0000000D	Debbi	Courage	dcourage0@mitbeian.gov.cn	Female	70 Waxwing Trail	9.37.29.203	21	0x009A0B9B43CF43429289EAF6B5500D540200
14	0x0000000E	Drud	Lawling	dlawlingc@topsy.com	Male	61 Buena Vista Park	185.99.8.205	17	0x009A0B9B43CF43429289EAF6B5500D540200
15	0x0000000F	Fidole	Vicar	fvicar@gravatar.com	Male	0 Buhler Circle	173.218.157.233	10	0x009A0B9B43CF43429289EAF6B5500D540200
16	0x00000010	Egor	Fedorch...	efedorchenkoe@usnews.com	Male	73962 Everett Alley	199.159.236.182	87	0x009A0B9B43CF43429289EAF6B5500D540200
17	0x00000011	Roxine	Bousler	rbouslerf@symantec.com	Female	4 Vermont Park	176.10.73.223	60	0x009A0B9B43CF43429289EAF6B5500D540200
18	0x00000012	Tipharie	Haps	thapag@yolasite.com	Female	24 Londondery Court	61.35.108.173	32	0x009A0B9B43CF43429289EAF6B5500D540200
19	0x00000013	Cissiee	Camili	ccamilih@chron.com	Female	2489 Bultman Lane	118.78.82.146	70	0x009A0B9B43CF43429289EAF6B5500D540200
20	0x00000014	Elaina	Jaumet	ejaumet@omniture.com	Female	62073 Montana Terr...	94.209.162.85	83	0x009A0B9B43CF43429289EAF6B5500D540200
21	0x00000015	Ilene	Oen	ioenj@milbeian.gov.cn	Female	83 Springview Center	102.77.92.180	8	0x009A0B9B43CF43429289EAF6B5500D540200
22	0x00000016	Airt	Aktoft	aaktoftk@man.com	Male	75334 Sloan Parkway	82.189.148.75	100	0x009A0B9B43CF43429289EAF6B5500D540200

Query executed successfully. TRABJAM1995\MSSQLSERVER01 (... TRABJAM1995\trabjam (51)) FinalDatabase 00:00:07 / 576000 rows

Properties

Current connect

Aggregate Status

Conne

Elapsed: 00:00:07.6

Finish: 12/5/2018

Name: TRABJAM

Rows: 576000

Start: 12/5/2018

State: Open

Connection

Conne TRABJAM

Connection Details

Conne 00:00:07.6

Conne Not encrypt

Conne 12/5/2018

Conne 576000

Conne 12/5/2018

Conne Open

Display: TRABJAM

Login: TRABJAM

Server: TRABJAM

Server: 14.0.2002

Session

SPID: 51

Name

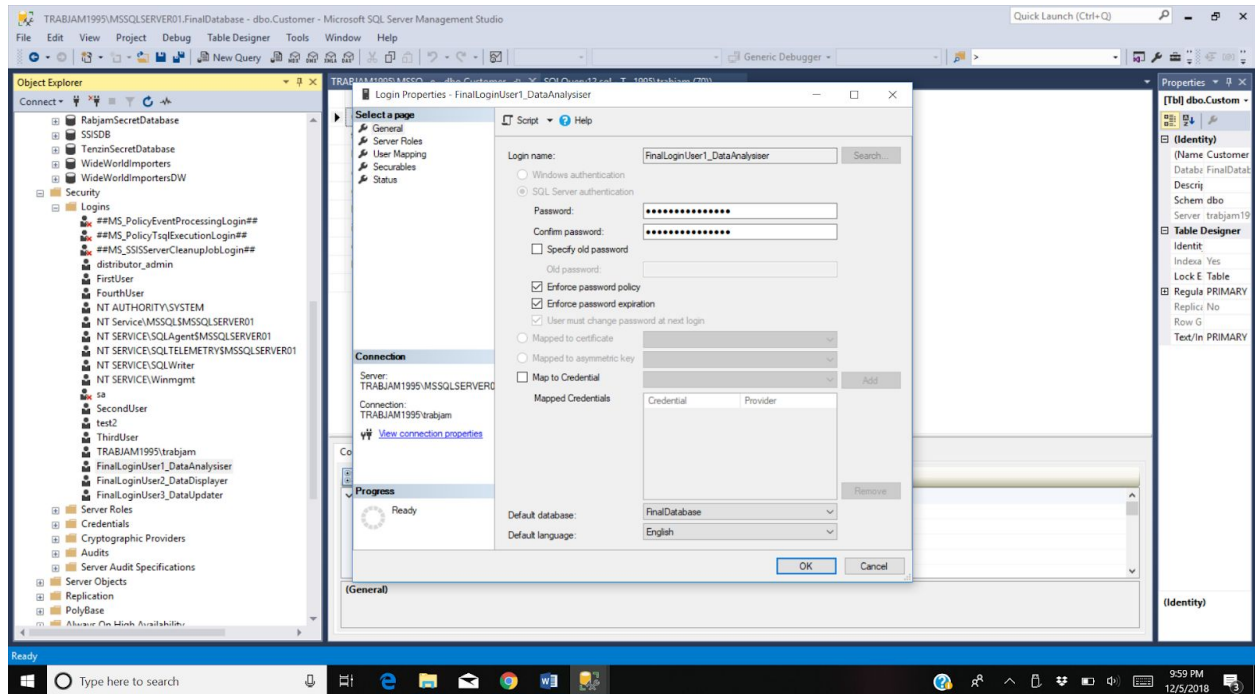
The name of the connection.

Ready Ln 2 Col 10 Ch 10 INS

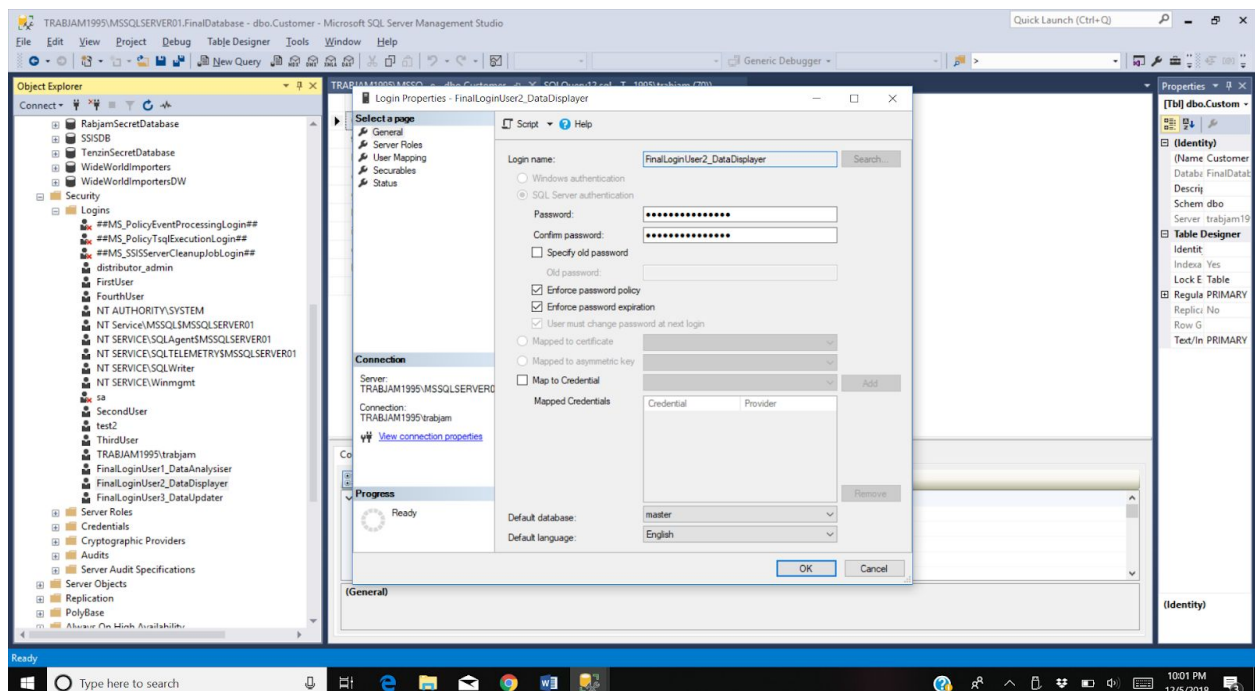
Type here to search

721 PM 12/5/2018

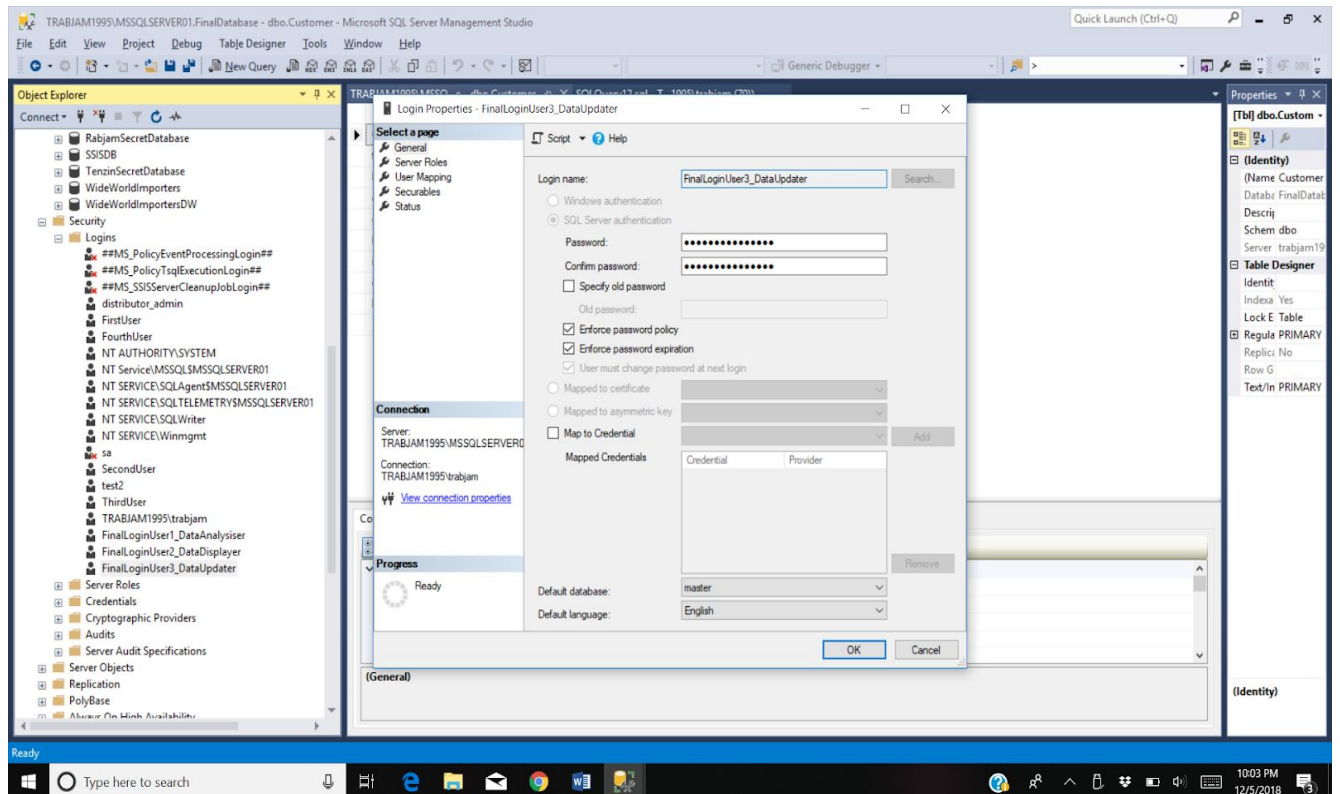
Step 3: Then on, I have created 4 logins as follows,
FinalLoginUser1_DataAnalysier: Scripting language writer's case (Sysadmin enabled all permissions granted)



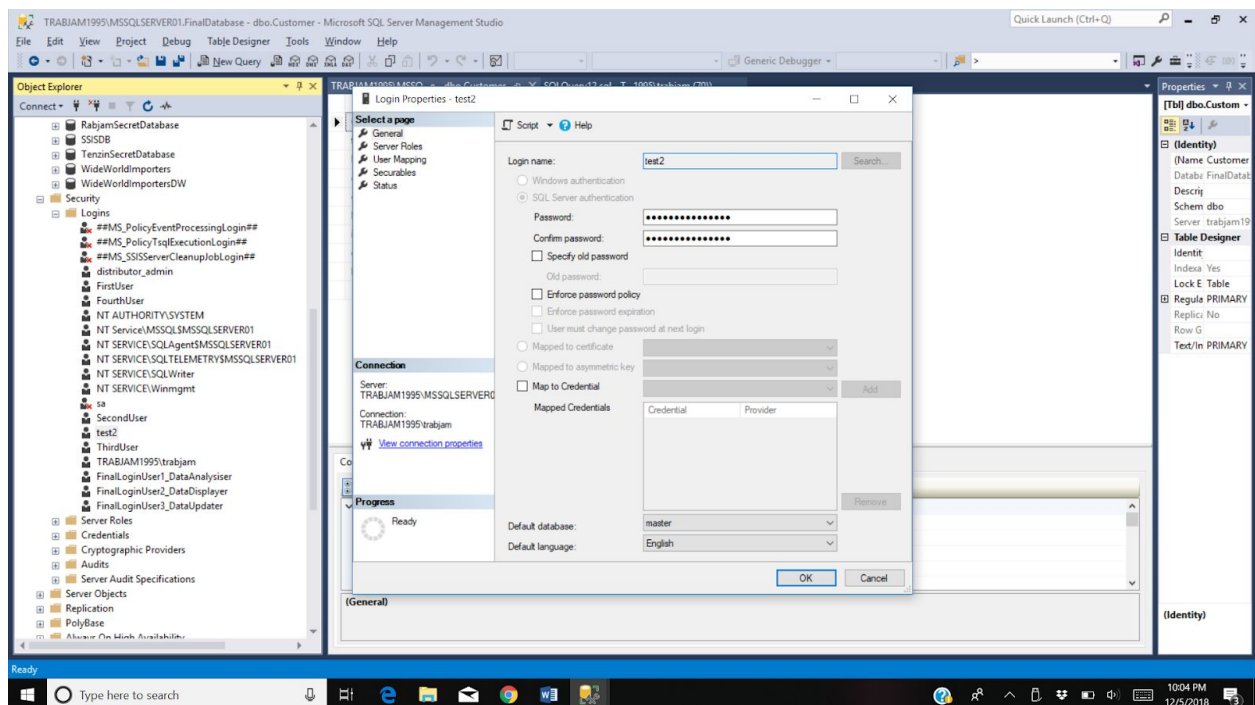
FinalLoginUser2_DataDisplayer: Client interactor (readonly granted)



FinalLoginUser3_DataUpdater:(bulkadmin enabled with all other permissions granted)

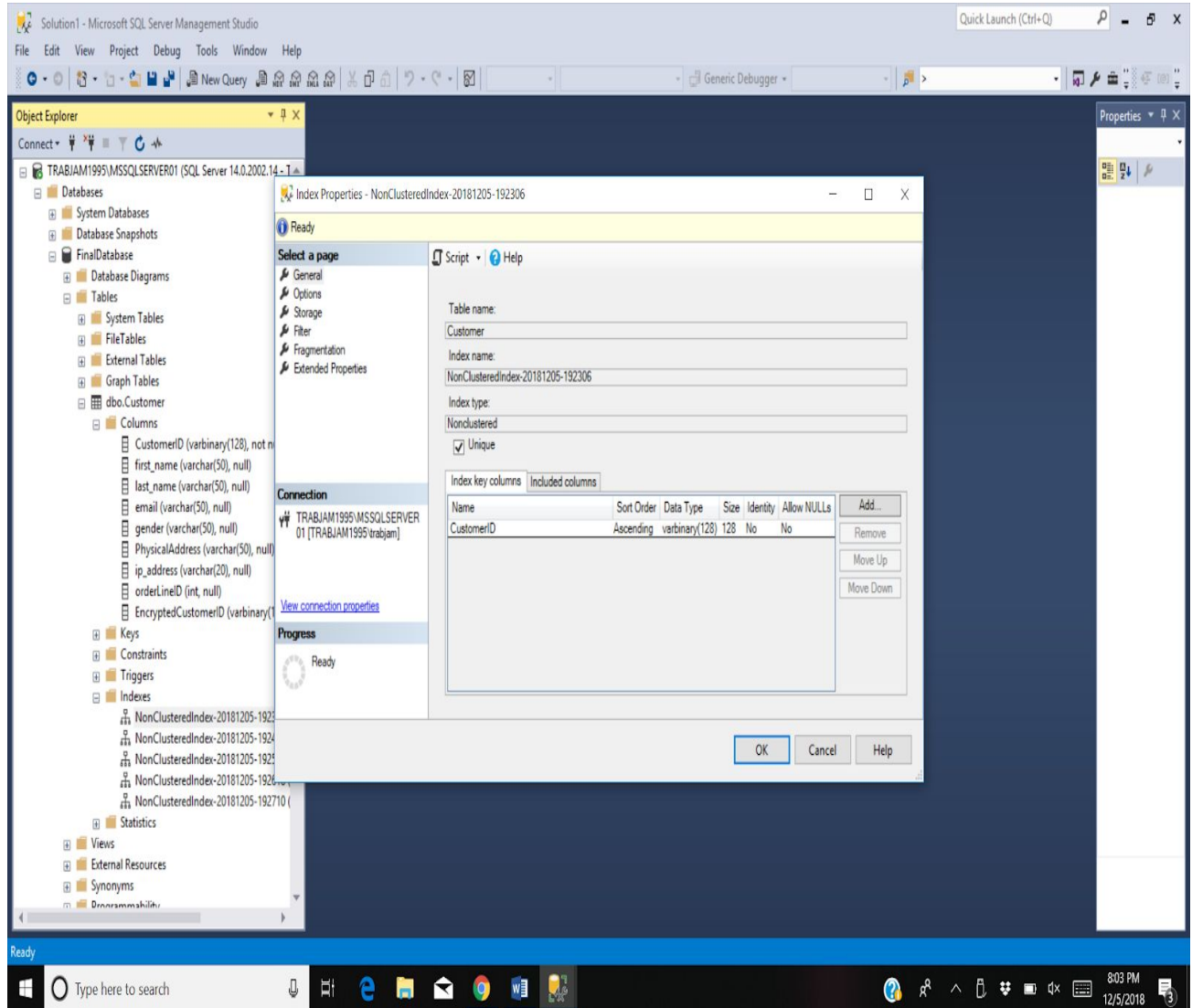


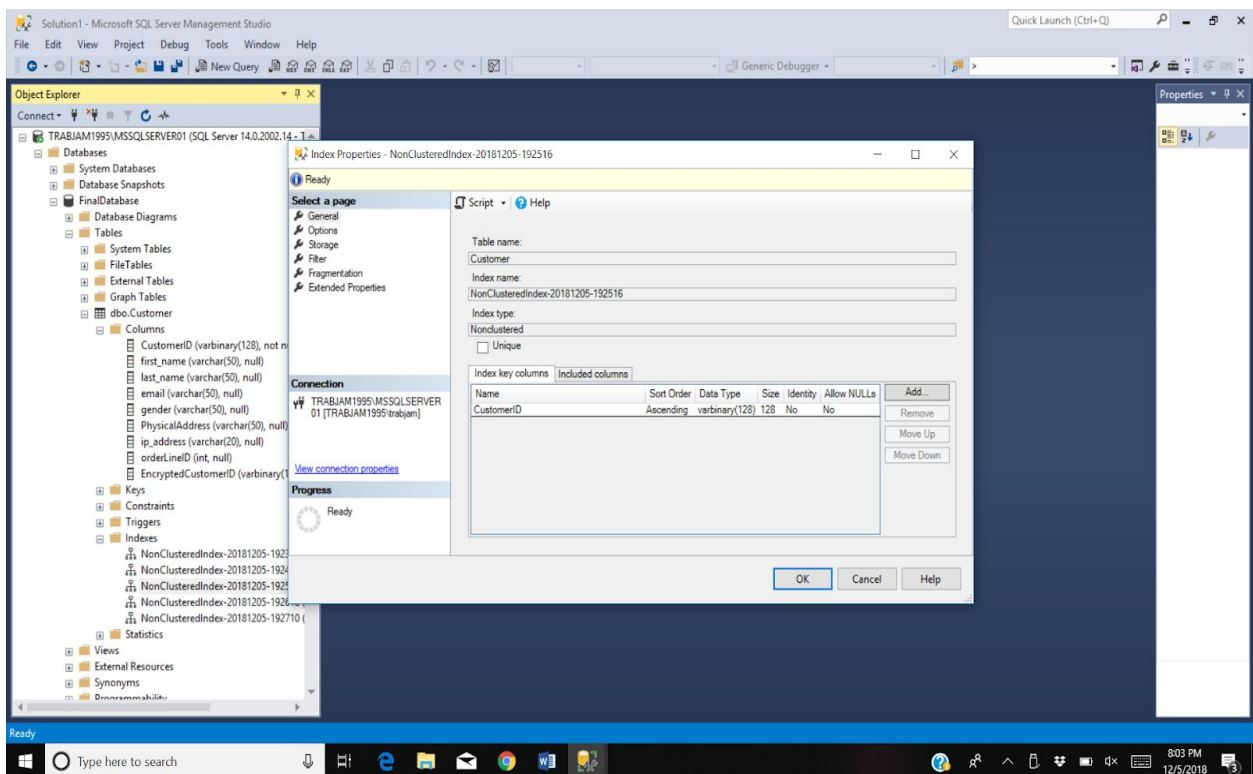
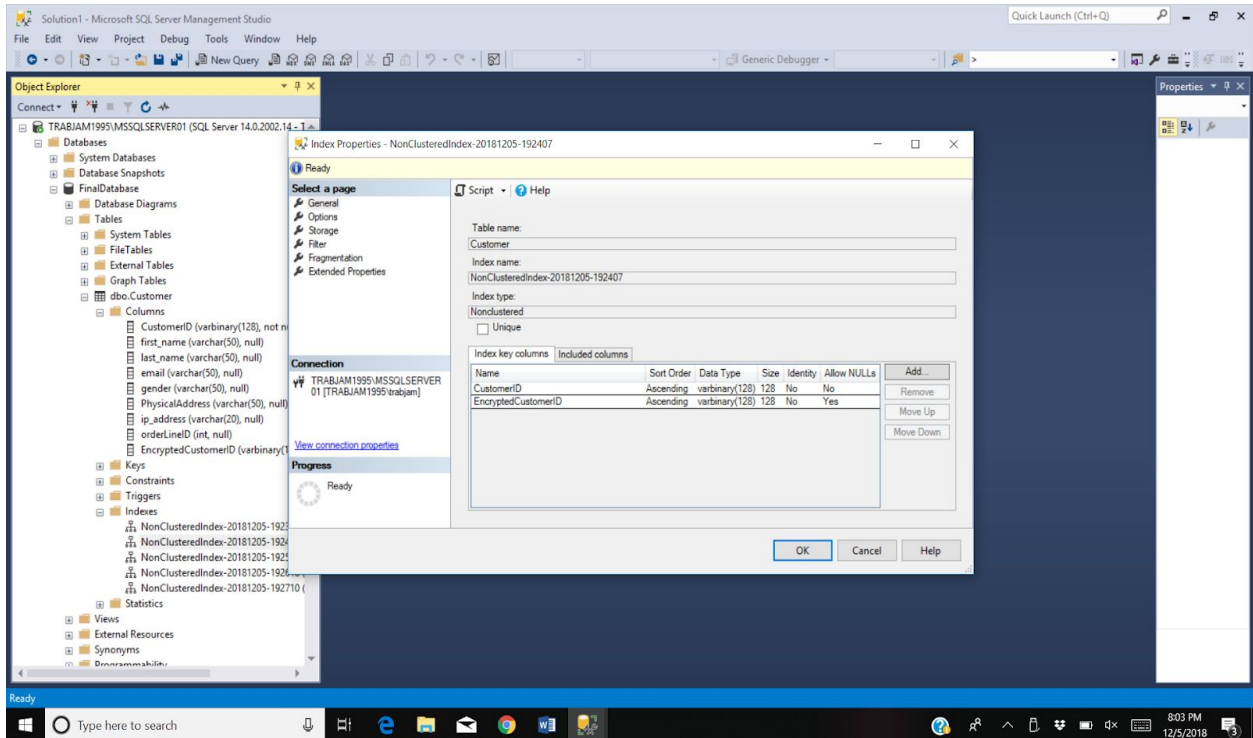
Test2: For testing cases (All permissions granted)

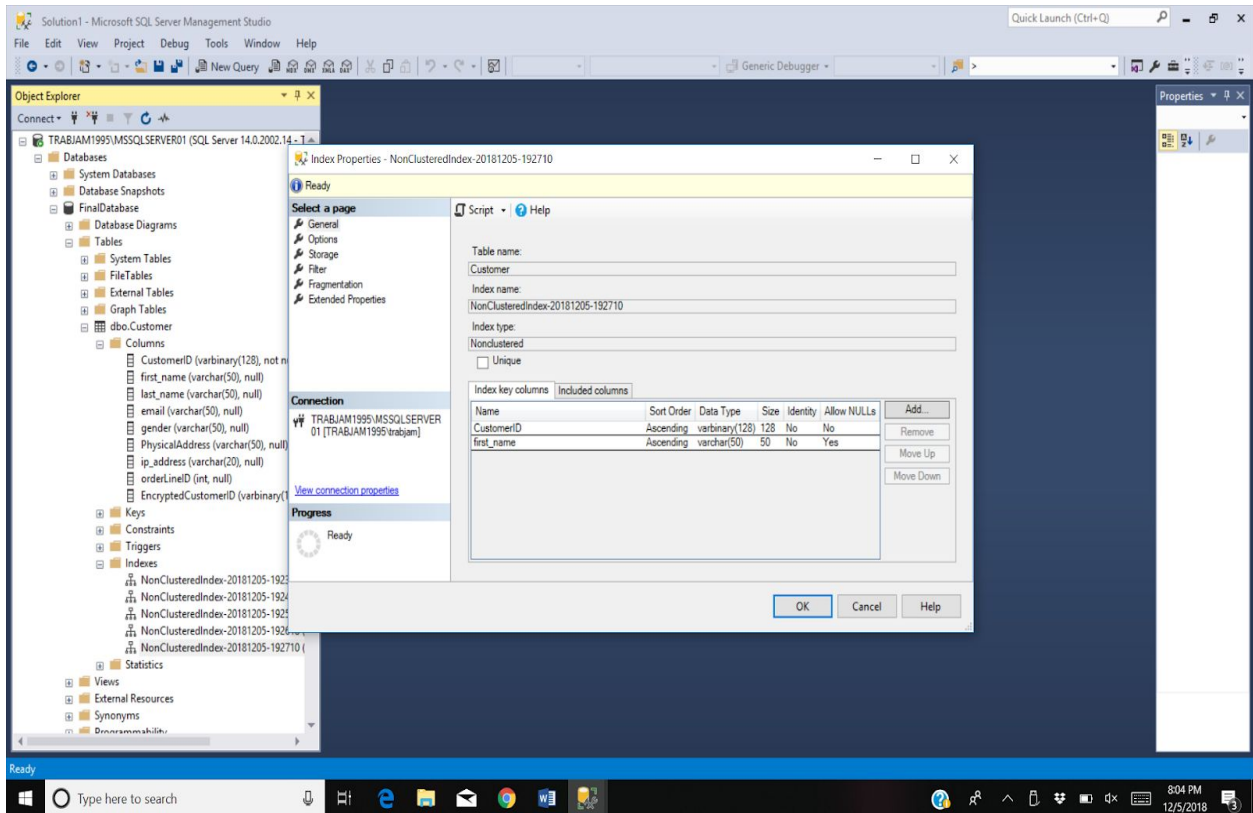
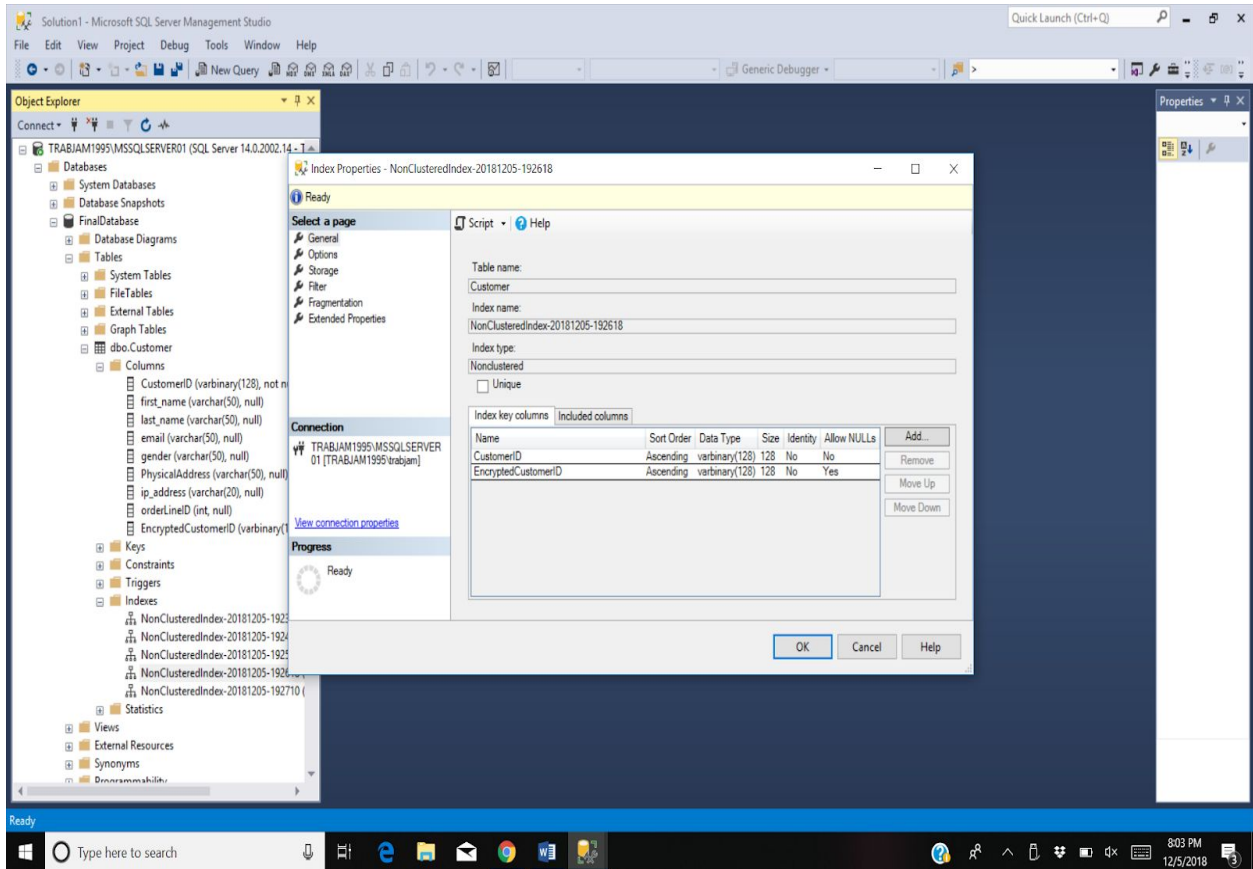


Step 4:

Then as per the instructions, I have created 5 non-clustered indexes:







Step 5:

Correspondingly, I have created a simple maintenance plan called “fullDiffTransactionLogBackup” for the different types of backups(Full, Differential and Transaction log backups) with the default time setups after every two weeks.

The screenshot displays the Microsoft SQL Server Enterprise Manager interface. The left pane shows the 'Object Explorer' with the 'Maintenance Plans' folder expanded under the 'FullDiffTransactionLog Backups' server. The main pane shows the 'FullDiffTransactionLog Backups [Design]' window, which contains a table of subplans and a flowchart of the backup tasks.

Subplan	Description	Schedule	Run as
Full	Full Backups	Occurs every day every 2 hou...	SQL Server Agent service account
Differential	Differential Backup	Occurs every week on Sunday...	SQL Server Agent service account
Transaction Logs	Transaction Logs	Occurs every week on Sunday...	SQL Server Agent service account

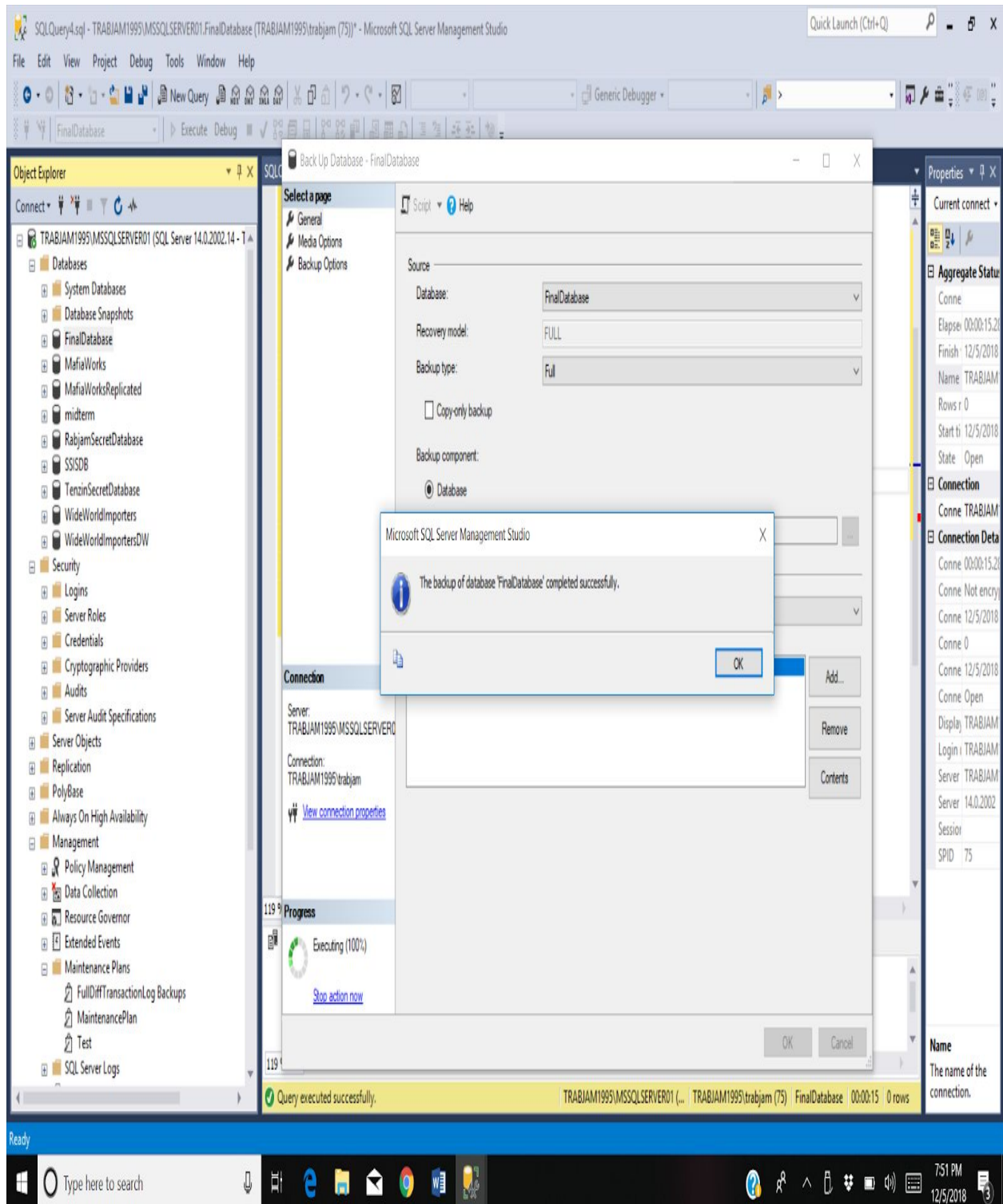
The flowchart shows the sequence of tasks:

- Full Back Up Database Task**: Backup Database on Local server connection, Databases: FinalDatabase, Type: Full, Append existing, Destination: Disk, Backup Compression (Default).
- Differential Back Up Database Task**: Backup Database on Local server connection, Databases: FinalDatabase, Type: Differential, Append existing, Destination: Disk, Backup Compression (Default).
- Back Up Database Task 2**: Backup Database on Local server connection, Databases: FinalDatabase, Type: Transaction Log, Append existing, Destination: Disk, Backup Compression (Default).

The right pane shows the 'Properties' window for the 'Full Sequence' task, with various execution and identification settings.

Step 6:

Then, I have loaded almost a million rows of fake customer's data from mockaroo. Until, my table's storage exceeds 50 mb. Then I have done a full backup of the database.



SQLQuery4.sql - TRABJAM1995\MSSQLSERVER01\FinalDatabase (TRABJAM1995\trabjam (75)) - Microsoft SQL Server Management Studio

File Edit View Project Debug Tools Window Help

Generic Debugger

FinalDatabase Execute Debug

Object Explorer

Connect

TRABJAM1995\MSSQLSERVER01 (SQL Server 14.0.2002.14 - T)

Databases

System Databases

Database Snapshots

FinalDatabase

Database Diagrams

Tables

System Tables

FileTables

External Tables

Graph Tables

dbo.Customer

Views

External Resources

Synonyms

Programmability

Service Broker

Storage

Security

MafiaWorks

MafiaWorksReplicated

midterm

RabjamSecretDatabase

SSISDB

TenzinSecretDatabase

WideWorldImporters

WideWorldImportersDW

Security

Logins

Server Roles

Credentials

Cryptographic Providers

Audits

Server Audit Specifications

Table Properties - Customer

Select a page

General

Permissions

Change Tracking

Storage

Security Predicates

Extended Properties

Script Help

Compression

Compression type None

Filegroups

FILESTREAM filegroup

Table is partitioned False

Text filegroup

Filegroup PRIMARY

General

Data space 66.430 MB

Vardecimal storage format is enabled False

Index space 88.469 MB

Row count 400000

Connection

Server: TRABJAM1995\MSSQLSERVER01

Connection: TRABJAM1995\trabjam

[View connection properties](#)

Progress

Ready

FILESTREAM filegroup

The name of the FILESTREAM filegroup containing the table.

OK Cancel

Properties

Current connect

Aggregate Status

Conne

Elapsed: 00:00:15.20

Finish: 12/5/2018

Name: TRABJAM

Rows: 0

Start time: 12/5/2018

State: Open

Connection

Conne: TRABJAM

Connection Details

Conne: 00:00:15.20

Conne: Not encrypted

Conne: 12/5/2018

Conne: 0

Conne: 12/5/2018

Conne: Open

Display: TRABJAM

Login: TRABJAM

Server: TRABJAM

Server: 14.0.2002

Session

SPID: 75

Name

The name of the connection.

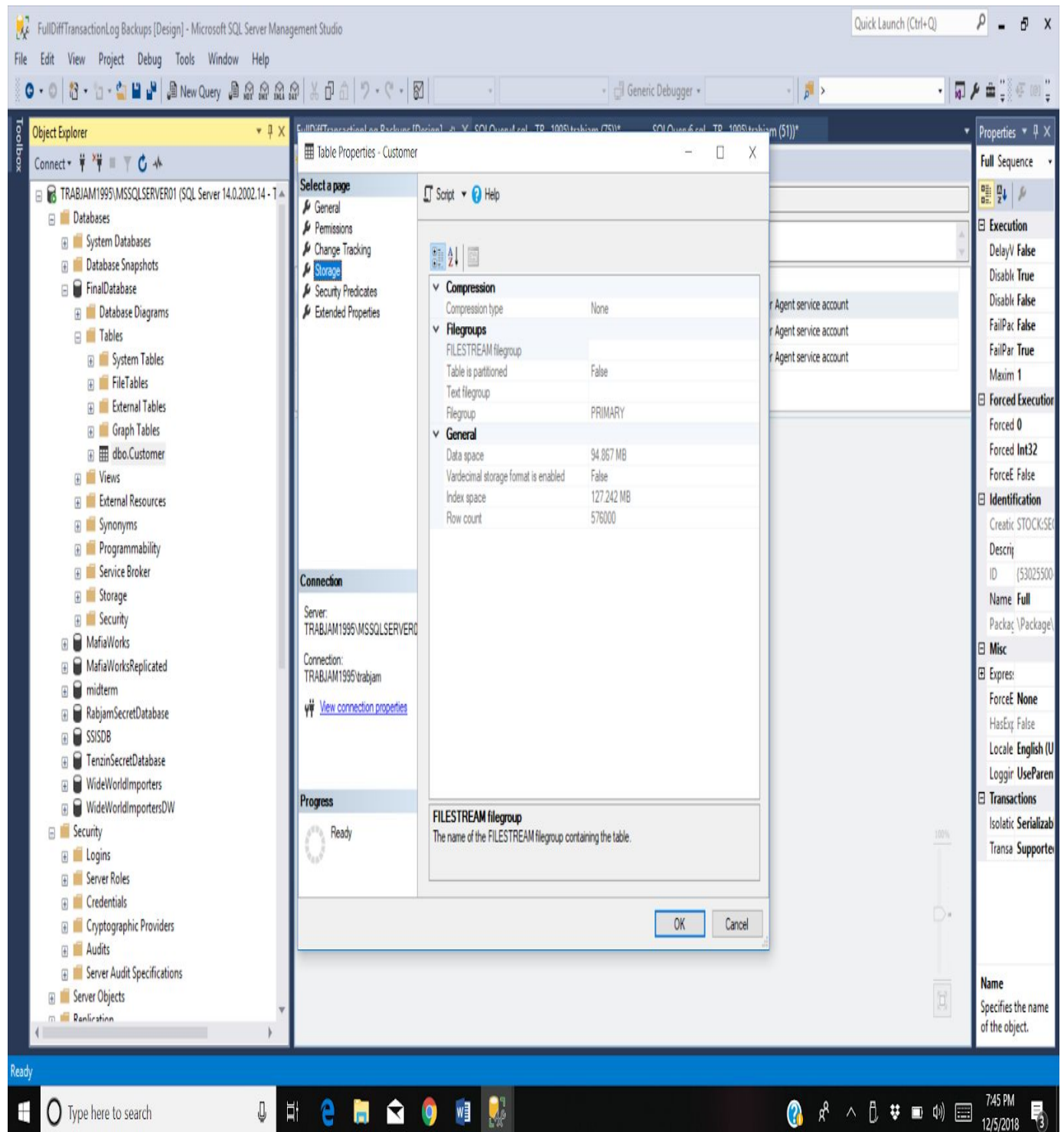
Query executed successfully. TRABJAM1995\MSSQLSERVER01 (100%) TRABJAM1995\trabjam (75) FinalDatabase 00:00:15 0 rows

Ready

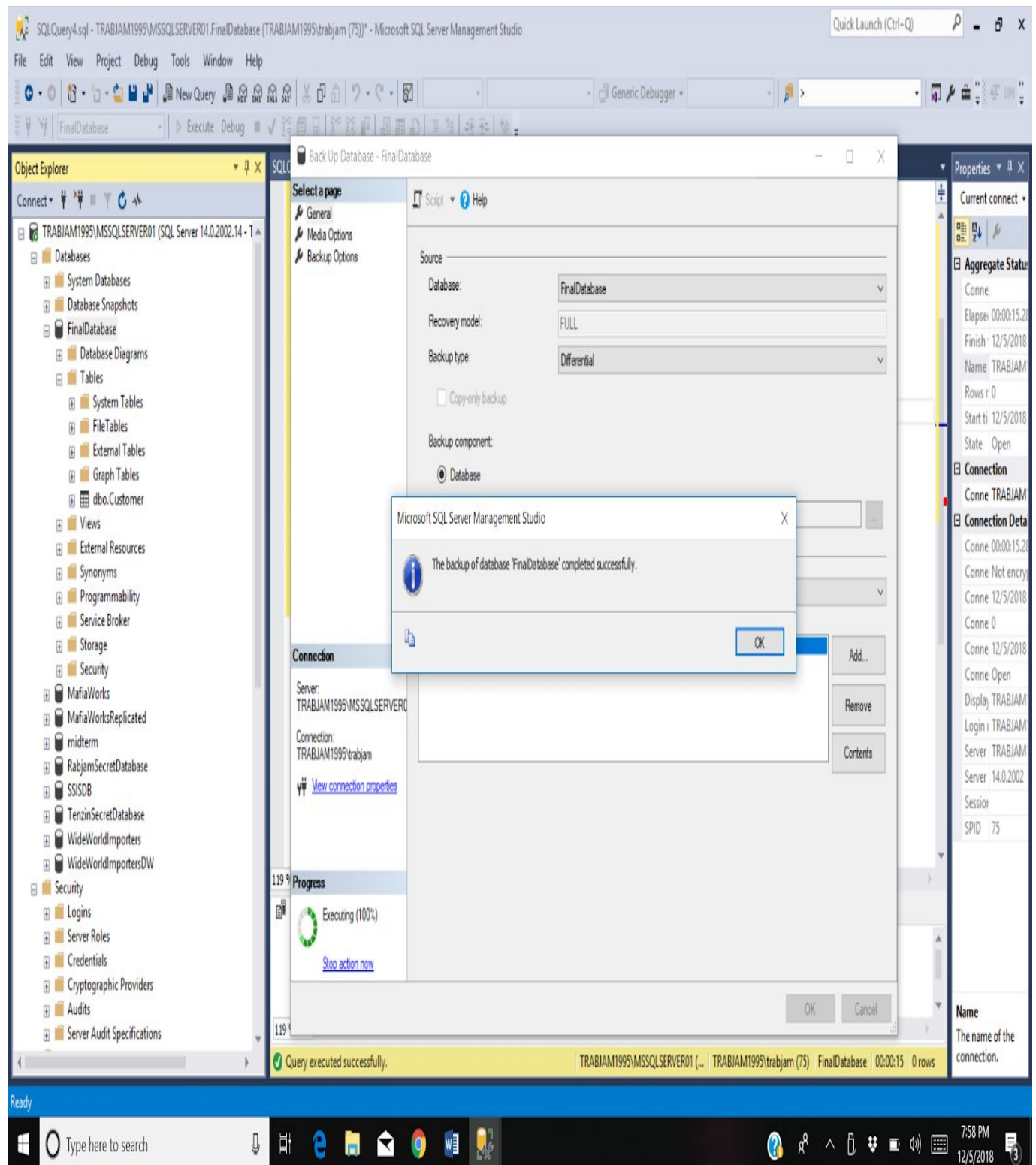
Type here to search

7:57 PM 12/5/2018

Then I have loaded more data in it exceeding 120MB (In the picture: it is loaded up to around 90 MB data because my backup was appended as I restored it for the extra 50 MB more).



Then, I did a differential backup after loading it:



Then I deleted almost 25MB data(approx 30MB):

The screenshot displays the Microsoft SQL Server Management Studio (SSMS) interface. The main window shows a SQL query being executed:

```
--For removing atleast 25 MB Data from my database.  
DELETE FROM DBO.Customer WHERE CustomerID > 400000;
```

The query execution results pane shows:

```
(176000 rows affected)
```

The status bar at the bottom indicates: "Query executed successfully. TRABJAM1995\MSSQLSERVER01 (... | TRABJAM1995\trabjam (70)) FinalDatabase 00:00:21 0 rows".

The Object Explorer on the left shows the database structure for TRABJAM1995\MSSQLSERVER01 (SQL Server 14.0.2002.14 - T...).

The Properties window on the right shows connection details for the current connection (Current connect):

- Aggregate Status: Conne
- Elapsed: 00:00:21.13
- Finish: 12/5/2018
- Name: TRABJAM
- Rows: 0
- Start time: 12/5/2018
- State: Open
- Connection: Conne TRABJAM
- Connection Details: Conne 00:00:21.13, Conne Not encrypt, Conne 12/5/2018, Conne 0, Conne 12/5/2018, Conne Open, Display TRABJAM, Login: TRABJAM, Server TRABJAM, Server 14.0.2002, Session, SPID 70
- Name: The name of the connection.

SQLQuery4.sql - TRABJAM1995\MSSQLSERVER01.FinalDatabase (TRABJAM1995\trabjam (75)) - Microsoft SQL Server Management Studio

File Edit View Project Debug Tools Window Help

Generic Debugger

FinalDatabase Execute Debug

Object Explorer

- Connect
- Databases
 - System Databases
 - Database Snapshots
 - FinalDatabase
 - Database Diagrams
 - Tables
 - System Tables
 - FileTables
 - External Tables
 - Graph Tables
 - dbo.Customer
 - Views
 - External Resources
 - Synonyms
 - Programmability
 - Service Broker
 - Storage
 - Security
 - MafiaWorks
 - MafiaWorksReplicated
 - midterm
 - RabjamSecretDatabase
 - SSISDB
 - TenzinSecretDatabase
 - WideWorldImporters
 - WideWorldImportersDW
- Security
 - Logins
 - Server Roles
 - Credentials
 - Cryptographic Providers
 - Audits
 - Server Audit Specifications

Table Properties - Customer

Select a page

- General
- Permissions
- Change Tracking
- Storage
- Security Predicates
- Extended Properties

Script Help

Compression

Compression type	None
------------------	------

Filegroups

FILESTREAM filegroup	
Table is partitioned	False
Text filegroup	
Filegroup	PRIMARY

General

Data space	66.430 MB
Vardecimal storage format is enabled	False
Index space	88.463 MB
Row count	400000

Connection

Server: TRABJAM1995\MSSQLSERVER01

Connection: TRABJAM1995\trabjam

[View connection properties](#)

Progress

Ready

FILESTREAM filegroup

The name of the FILESTREAM filegroup containing the table.

OK Cancel

Properties

Current connect

Aggregate Status

Conne

Elapsed: 00:00:15.20

Finish: 12/5/2018

Name: TRABJAM

Rows: 0

Start time: 12/5/2018

State: Open

Connection

Conne: TRABJAM

Connection Details

Conne: 00:00:15.20

Conne: Not encrypted

Conne: 12/5/2018

Conne: 0

Conne: 12/5/2018

Conne: Open

Display: TRABJAM

Login: TRABJAM

Server: TRABJAM

Server: 14.0.2002

Session

SPID: 75

Name

The name of the connection.

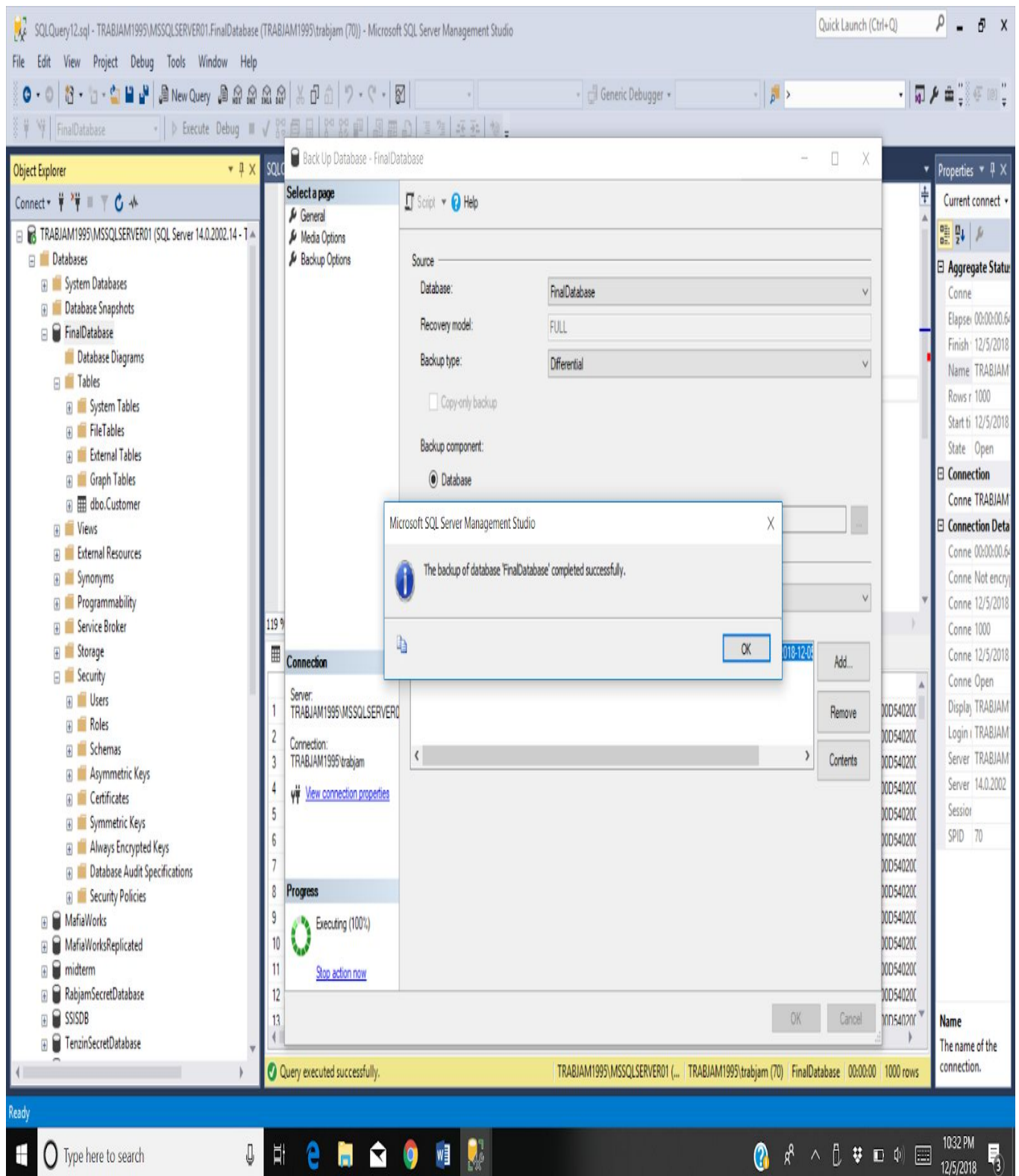
Query executed successfully. TRABJAM1995\MSSQLSERVER01 (... TRABJAM1995\trabjam (75) FinalDatabase: 00:00:15 0 rows

Ready

Type here to search

7:57 PM 12/5/2018

Then I did another differential backup,



I have turned in the 3 backups, database documentation, screen shot of the maintenance plan and a quick summary of what I have learned and how it might help me find a DBA job. I have a little differed backups as it got appended to previous one. Thank you Professor for this fruitful semester and I truly appreciate it.