

20764 Administering a Microsoft SQL Database Infrastructure Project 1

Introduction

This project will test your knowledge on the labs that you have completed in this course. You will work with the database you created in Assignment 5, making modifications as necessary. **Ensure that you have completed Assignments 5, 8 and 10 in their entirety** before you begin this project. In addition, before you begin, please ensure that you verify the information that is your RetailSales database, and re-run SQL commands as necessary.

Database Structure

The following tables should already represent the structure of your RetailSales database.

Database:	Retail Sales				
Table:	Ottawa.Customers		Table:	Ottawa.Suppliers	
Column Name	Character Type	Max Characters	Column Name	Character Type	Max Characters
CUSTOMERID	int (PK)		SUPPLIERID	int (PK)	
FIRSTNAME	varchar	100	SUPPLIERNAME	varchar	100
LASTNAME	varchar	100	ADDRESS	varchar	100
ADDRESS	varchar	100	CITY	varchar	100
CITY	varchar	100	PROVINCE	varchar	100
PROVINCE	varchar	100	POSTALCODE	varchar	100
PHONENUMBER	varchar	100	PHONENUMBER	varchar	100
Table:	Ottawa.Products		Table:	Transactions	
Column Name	Character Type	Max Characters	Column Name	Character Type	Max Characters
PRODUCTID	int (PK)		TRANSNUM	int (PK)	
DESCRIPTION	varchar	255	PRODUCTID	int (FK)	
COST	money		CUSTOMERID	int (FK)	
RETAILPRICE	money		RETAILPRICE	money	
SUPPLIERID	int (FK)		QUANTITY	int	

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Table Information:

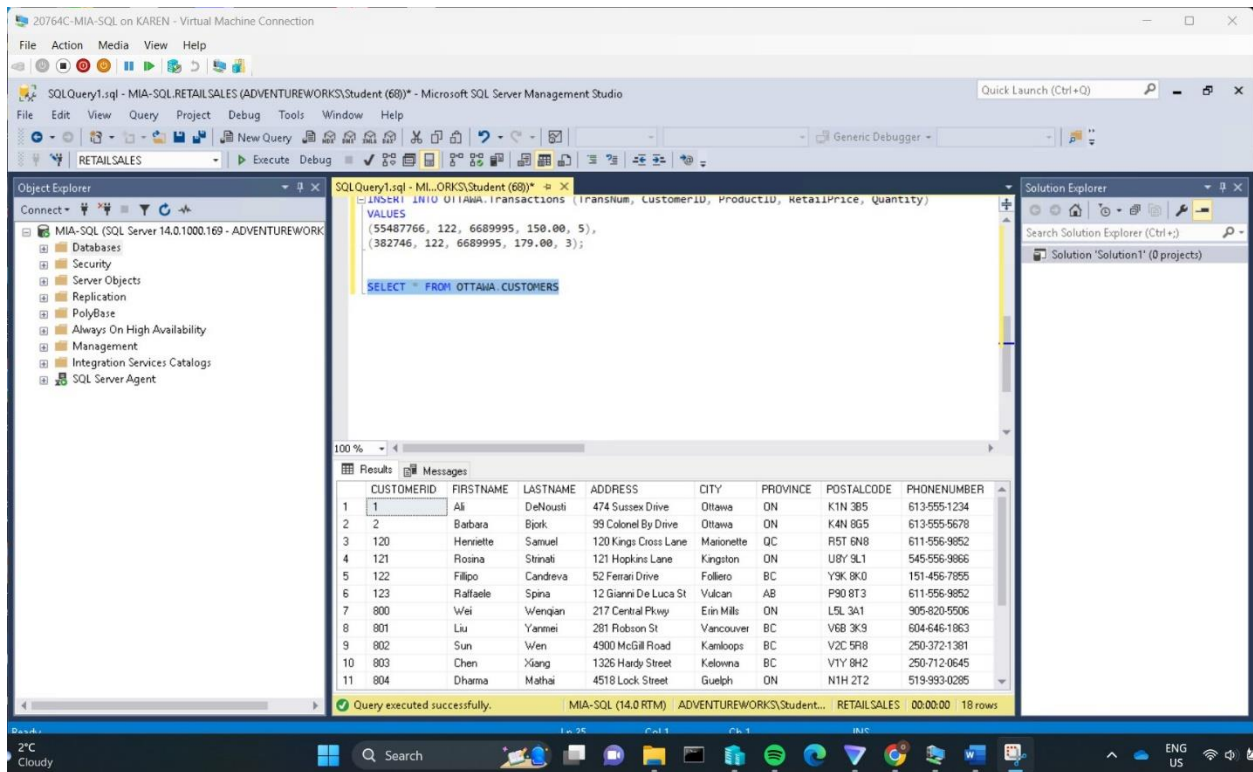
Add the following information into the tables.

Customers Table			
CustomerID:	120	CustomerID:	121
FirstName:	Henriette	FirstName:	Rosina
LastName:	Samuel	LastName:	Strinati
Address:	120 Kings Cross Lane	Address:	121 Hopkins Lane
City:	Marionette	City:	Kingston
Province:	QC	Province:	ON
PostalCode:	R5T 6N8	PostalCode:	U8Y 9L1
PhoneNumber:	611-556-9852	PhoneNumber:	545-556-9866
CustomerID:	122	CustomerID:	123
FirstName:	Fillipo	FirstName:	Raffaele
LastName:	Candrea	LastName:	Spina
Address:	52 Ferrari Drive	Address:	12 Gianni De Luca St
City:	Folliero	City:	Vulcan
Province:	BC	Province:	AB
PostalCode:	Y9K 8K0	PostalCode:	P90 8T3
PhoneNumber:	151-456-7855	PhoneNumber:	611-556-9852
Suppliers Table			
SupplierID:	779562	SupplierID:	688559
SupplierName:	Multimicro Inc	SupplierName:	ChrisCo
Address:	29 Multimicro Way	Address:	73 Wild Goose Road
City:	Laval	City:	WaWa
Province:	QC	Province:	ON
PostalCode:	U8P 0Y7	PostalCode:	POS 0A2
PhoneNumber:	819-966-3579	PhoneNumber:	552-669-9866
Products Table			
ProductID:	6689995	ProductID:	6685585
Description:	Logitech Ergo K860	Description:	High Speed 4K HDMI Cable, 25ft
Cost:	101.10	Cost:	12.00
RetailPrice	150.00	RetailPrice	19.99
SupplierID	779562	SupplierID	779562
Transactions Table			
TransNum:	55487766	TransNum:	382746
CustomerID:	122	CustomerID:	122
ProductID:	6689995	ProductID:	6689995
RetailPrice:	150.00	RetailPrice:	179.00
Quantity:	5	Quantity:	3

Query

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- Run a query that display the contents of all tables (do four separate queries)
 - Take a screenshot



The screenshot shows the Microsoft SQL Server Enterprise Manager interface. The left pane displays the Object Explorer with the 'MIA-SQL (SQL Server 14.0.1000.169 - ADVENTUREWORKS)' server selected. The central pane shows a query window with the following SQL code:

```
SELECT * FROM OTTAWA.CUSTOMERS
```

The right pane shows the Results tab with the following data:

CUSTOMERID	FIRSTNAME	LASTNAME	ADDRESS	CITY	PROVINCE	POSTALCODE	PHONENUMBER
1	Ali	DeNouiti	474 Sussex Drive	Ottawa	ON	K1N 3B5	613-555-1234
2	Barbara	Bjork	99 Colonel By Drive	Ottawa	ON	K4N 8G5	613-555-5678
3	Henriette	Samuel	120 Kings Cross Lane	Mosionette	QC	R5T 6N8	611-555-9852
4	Rosina	Stinaki	121 Hopkins Lane	Kingston	ON	U8Y 9L1	545-555-9865
5	Filipo	Candeva	52 Ferrari Drive	Follero	BC	Y9K 8K0	151-456-7895
6	Raffaele	Spina	12 Gianni De Luca St	Vulcan	AB	P90 8T3	611-555-9852
7	Wei	Wengian	217 Central Pkwy	Ein Mills	ON	L5L 3A1	905-820-9506
8	Liu	Yanmei	281 Robson St	Vancouver	BC	V6B 3K9	604-646-1863
9	Sun	Wen	4900 McGill Road	Kamloops	BC	V2C 5R8	250-372-1381
10	Chen	Xiang	1326 Hardy Street	Kelowna	BC	V1Y 8H2	250-712-0645
11	Dharma	Mathai	4518 Lock Street	Guelph	ON	N1H 2T2	519-993-0285

The bottom status bar indicates 'Query executed successfully. MIA-SQL (14.0 RTM) ADVENTUREWORKS\Student... RETAILSALES 00:00:00 18 rows'.

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The image displays two screenshots of the Microsoft SQL Server Enterprise Manager interface, specifically the SQL Query Editor window, showing the execution of SQL queries and the resulting data.

Top Screenshot: The query editor shows a query that selects data from the `OTTAWA.SUPPLIERS` table. The query is:

```
SELECT * FROM OTTAWA.SUPPLIERS
```

The results pane displays a table with 11 rows and 7 columns: `SUPPLIERID`, `SUPPLIERNAME`, `ADDRESS`, `CITY`, `PROVINCE`, `POSTALCODE`, and `PHONENUMBER`. The data is as follows:

SUPPLIERID	SUPPLIERNAME	ADDRESS	CITY	PROVINCE	POSTALCODE	PHONENUMBER
567289	Network Solutions	1273 Wellington st	Ottawa	ON	K9R 8W9	613-555-2837
567290	Supply Adept	2582 Brand Road	Saskatoon	SK	S7K 1W8	306-717-3319
567291	Supplyva	1401 Brew Creek Rd	Whistler	BC	V0N 1B0	604-698-3922
567292	Empower	3858 50th Street	Vegreville	AB	T9C 1S1	780-210-8977
567293	Microio	1938 Promenade du Portage	Hull	QC	S4P 3Y2	819-771-5121
567294	Microaholic	3988 Glover Road	Coquitlam	BC	V3J 4S1	604-931-6017
567295	Datahalt	3659 53rd Street	Calgary	AB	T0M 1T1	403-845-6088
567296	Boticly	2130 Paradise Crescent	Hauterive	QC	G5C 1M1	418-297-7159
567297	Overleap	4798 Scotchmere Dr	Unionville	ON	L3R 0L7	905-479-1129
567298	Technium	4179 Blind Bay Road	Salmon Arm	BC	V0E 2T0	250-803-8667
567299	TechOSmic	477 Duke Street	Montreal	ON	H3C 5K4	514-235-4712

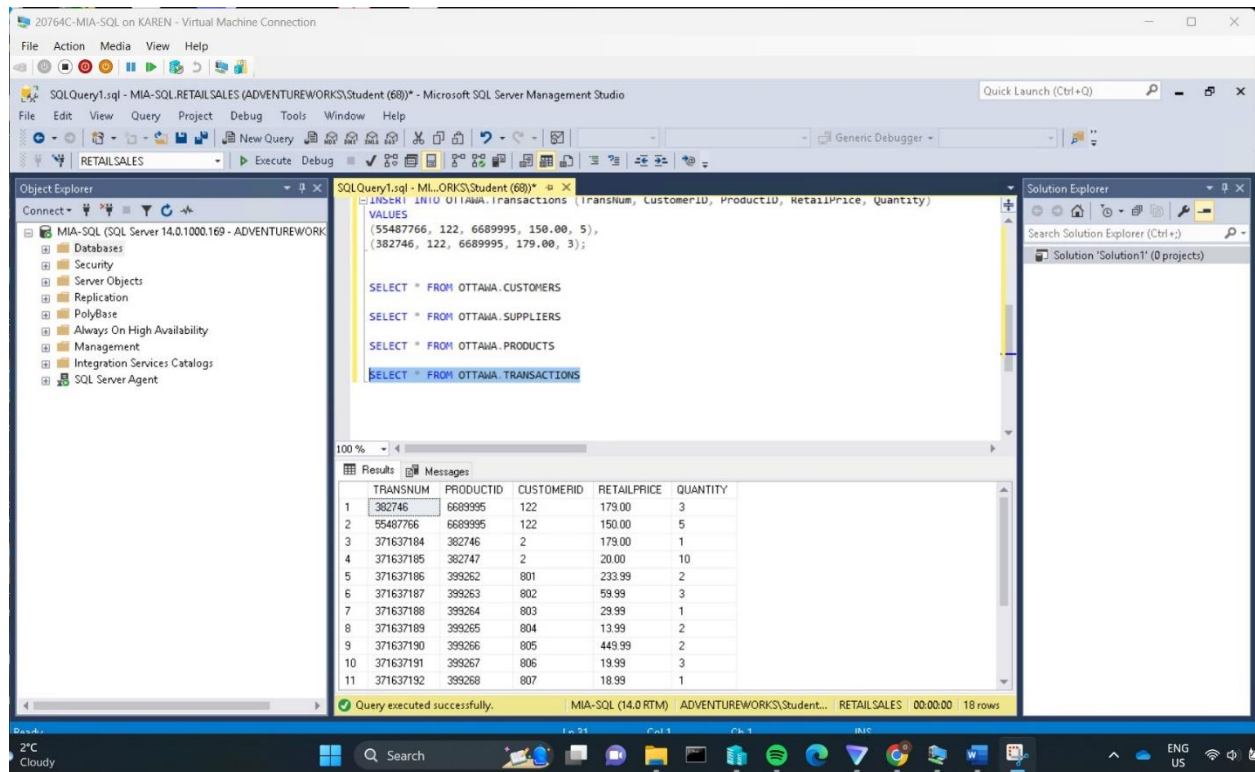
Bottom Screenshot: The query editor shows a query that selects data from the `OTTAWA.PRODUCTS` table. The query is:

```
SELECT * FROM OTTAWA.PRODUCTS
```

The results pane displays a table with 11 rows and 5 columns: `PRODUCTID`, `DESCRIPTION`, `COST`, `RETAILPRICE`, and `SUPPLIERID`. The data is as follows:

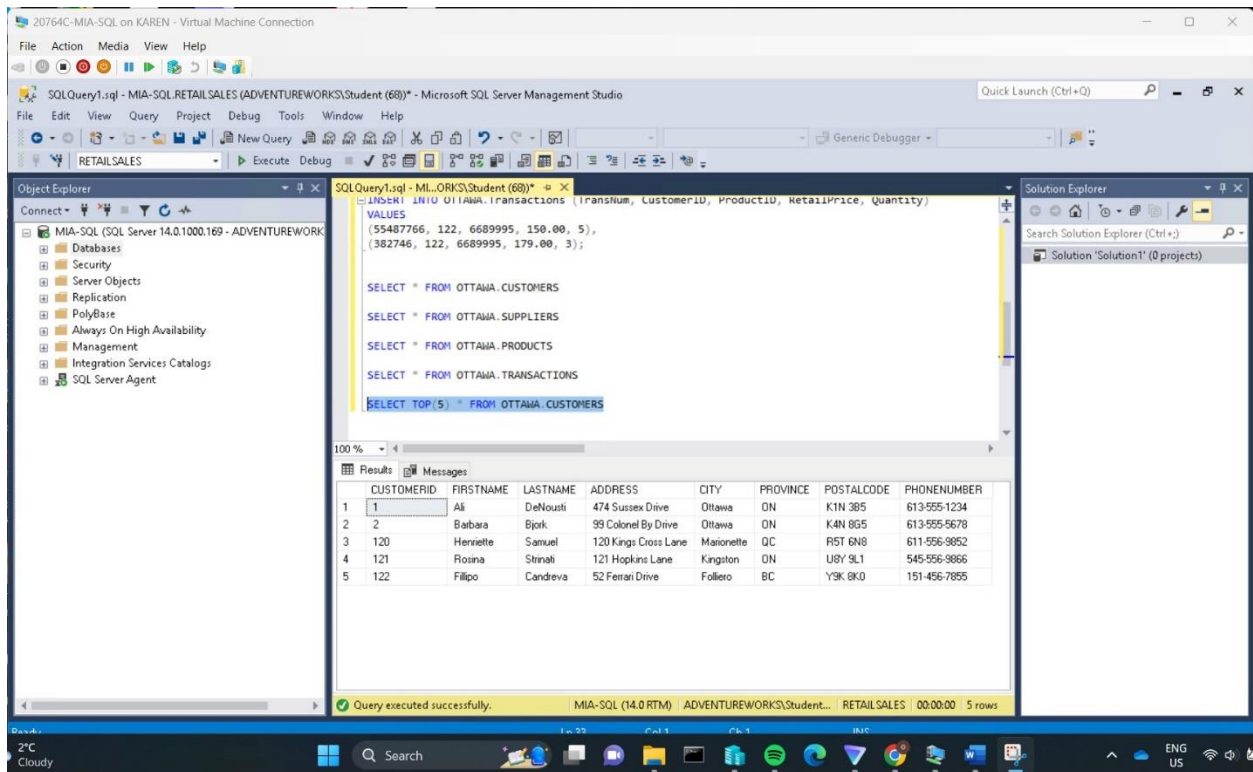
PRODUCTID	DESCRIPTION	COST	RETAILPRICE	SUPPLIERID
382746	Netgear Nighthawk AC2100 Smart WiFi Router - Dual Band G...	120.00	179.00	567289
382747	Cat 6 Ethernet Cable 100 ft Flat White, Slim Long Internet Net...	10.00	23.00	993817
399258	CyberPower CP1000AVR LCD Intelligent LCD UPS System	120.00	171.99	567299
399259	Samsung LU28R550UNQNZ 28-inch 4K UHD Monitor	120.00	449.99	567297
399260	Samsung LC49G95TSSNQZA WQHD Curved Super Wide 32...	1597.00	1999.99	567290
399261	HUANUO Dual Monitor Mount Stand	49.00	95.59	567291
399262	GTRACING Gaming Chair with Footrest Massage Office Chair ...	200.00	233.99	567292
399263	Redragon K585 DIT1 One-Handed RGB Gaming Keyboard	58.88	59.99	567293
399264	DELLUX 67G (2.36oz) Wired Lightweight Gaming Mouse	21.22	29.99	567294
399265	STANZ Basic Helping Third Hand with Magnifier	12.33	13.99	567295
399266	Powerextra 1800W Heat Gun Kits	12.36	36.99	567296

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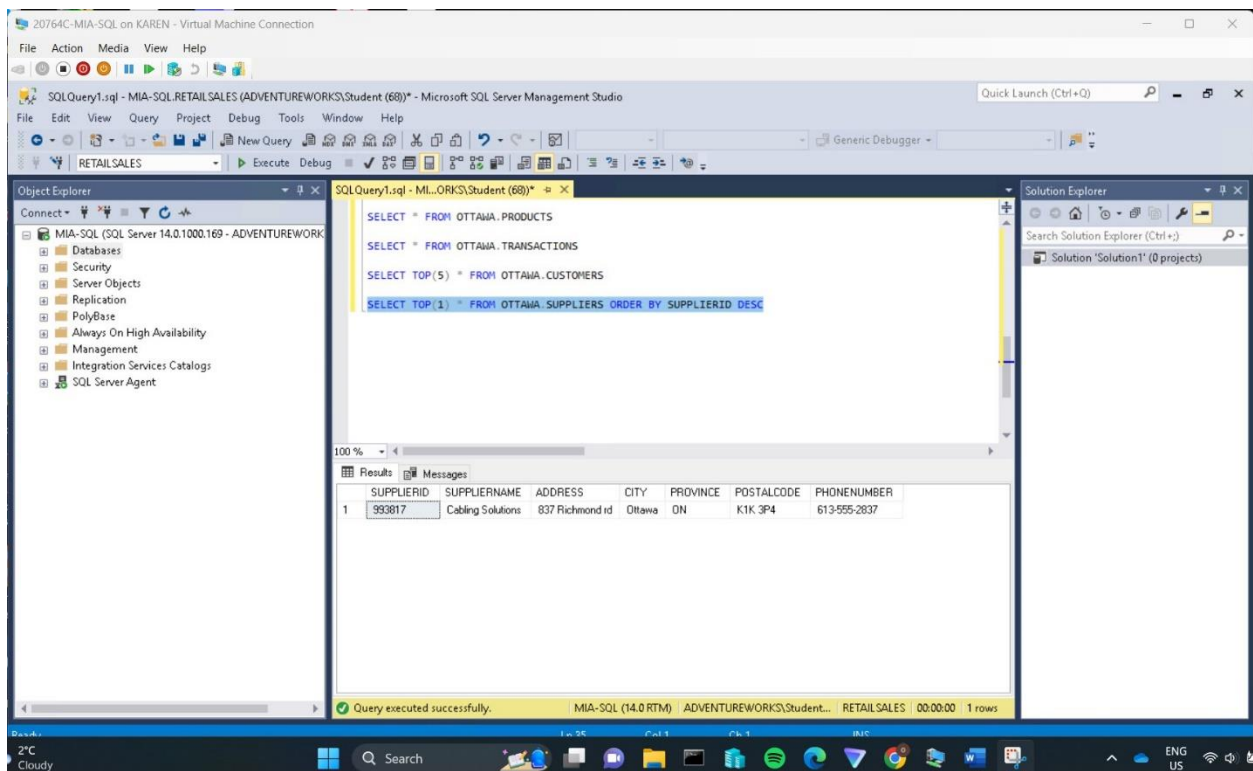


- Run a query that displays only the first 5 lines of the Customers table
 - Take a screenshot

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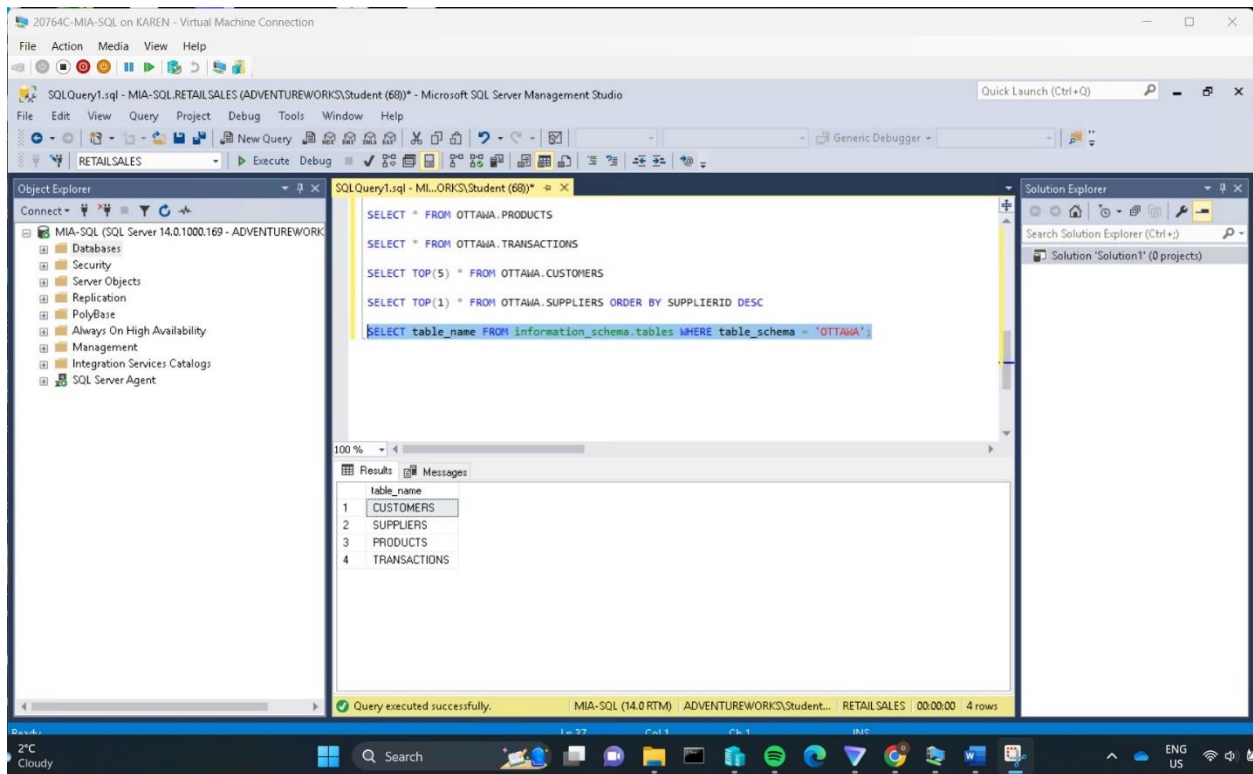


- Run a query that displays the last line in the Suppliers table
 - Take a screenshot



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- Run a query that displays the names of the four tables that you created in the RetailSales database
 - Take a screenshot



Backup

- Perform a Full backup of the RetailSales database
 - Take a screenshot that displays the size of the RetailSales database backup
 - Note: You can either run an SQL query on the size of the backup or take a screenshot of File Explorer showing the file size.

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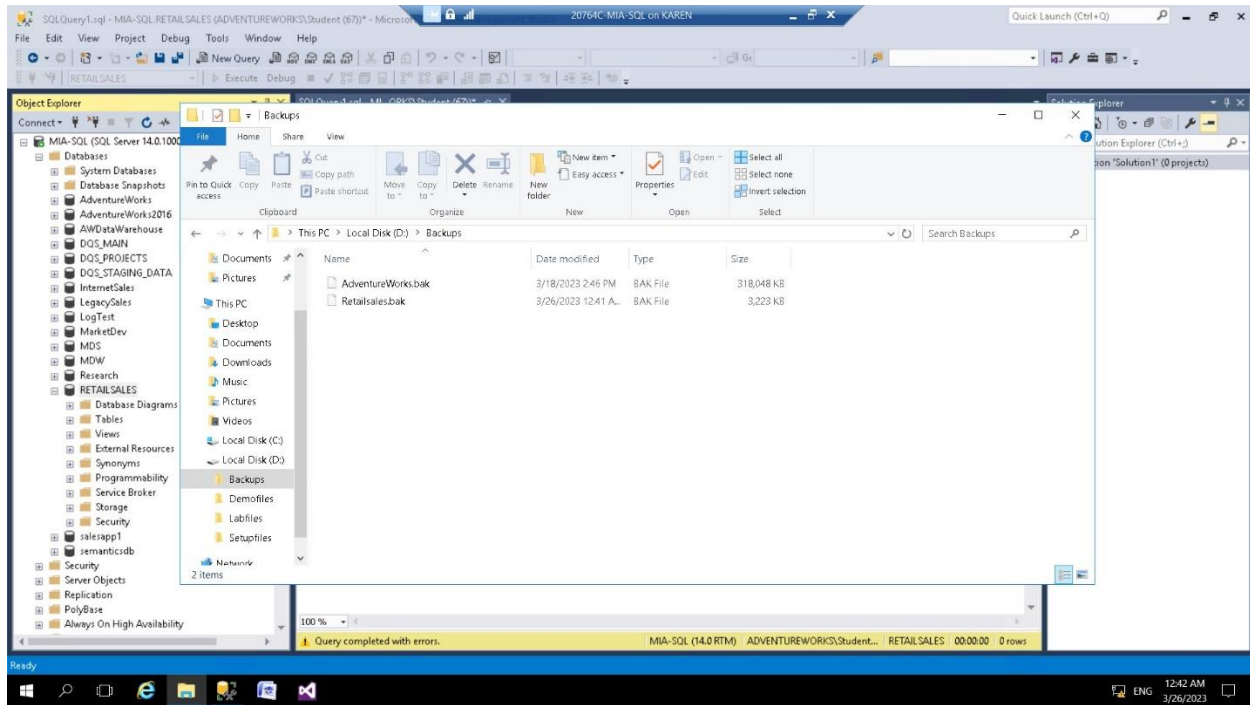


Table Information (Revisited)

Add the following information to the database into the appropriate table.

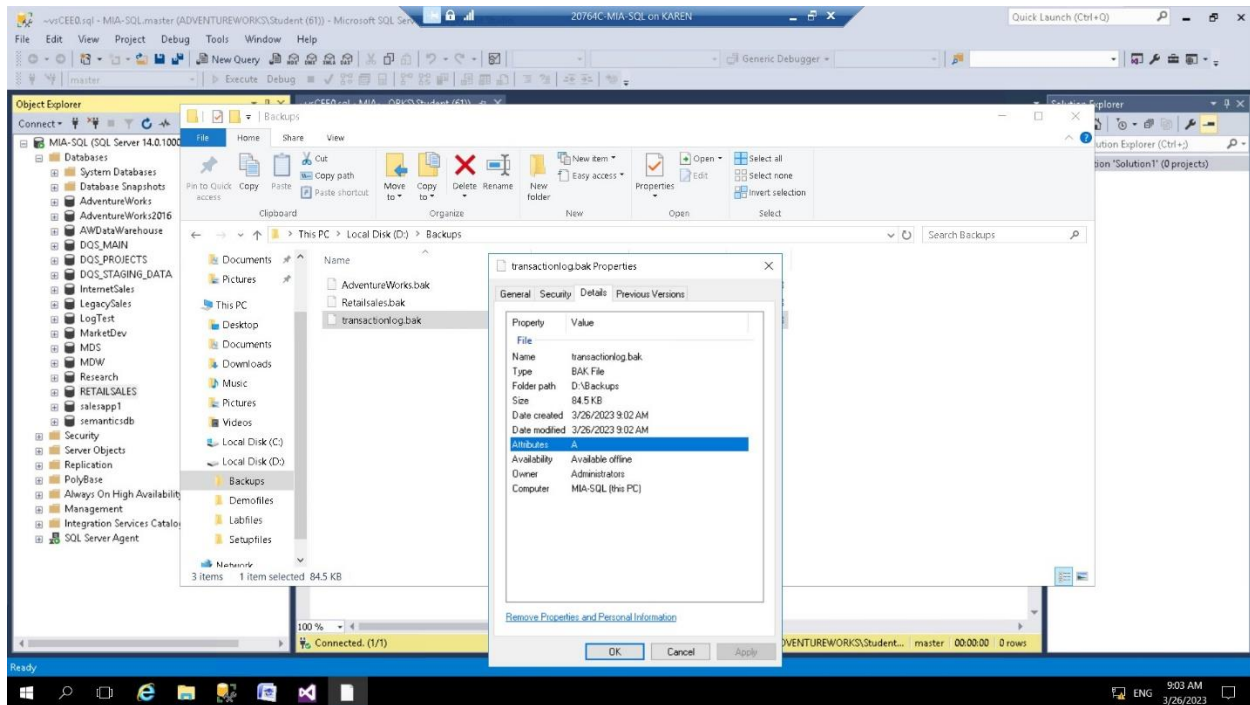
Customers Table	
CustomerID:	130
FirstName:	Tamara
LastName:	Egorova
Address:	6665 Kiseleva Way
City:	Seren
Province:	MN
PostalCode:	S9E 3R3
PhoneNumber:	955-556-2223
Suppliers Table	
SupplierID:	8859992
SupplierName:	Kalindi Corp
Address:	1 Starfield Way
City:	Cali
Province:	YK
PostalCode:	C8A L1E
PhoneNumber:	332-654-7855
Products Table	
ProductID:	62223335
Description:	Projector Screen 100 Inch 16:9
Cost:	51.00
RetailPrice:	109.96
SupplierID:	8859992
Transactions Table	
TransNum:	55488855
CustomerID:	121

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ProductID:	62223335
RetailPrice:	109.96
Quantity:	1

Backup (Revisited)

- Perform a transaction log backup of the RetailSales database
 - Take a screenshot showing the size of the transaction log backup



Query

- Run a query displaying the last line entered of each table
 - Take a screenshot for each query

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The screenshot displays the Microsoft SQL Server Enterprise Manager interface. The left pane shows the Object Explorer with the 'MIA-SQL (SQL Server 14.0.1000.169 - ADVENTUREWORKS)' server selected. The central pane shows a query window with the following SQL script:

```
INSERT INTO OTTAWA.Customers (CustomerID, FirstName, LastName, Address, City, Province, PostalCode, PhoneNumber) VALUES (130, 'Tamar', 'Egorova', '6665 Kiseleva Way', 'Seren', 'MN', '55488855', '955-556-2223');

INSERT INTO OTTAWA.Suppliers (SupplierID, SupplierName, Address, City, Province, PostalCode, PhoneNumber) VALUES (8859992, 'Projector Screen 100', '100 Main St', 'Seren', 'MN', '55488855', '955-556-2223');

INSERT INTO OTTAWA.Products (ProductID, Description, Cost, RetailPrice, SupplierID) VALUES (62223335, 'Projector Screen 100', 100, 100, 8859992);

INSERT INTO OTTAWA.Transactions (TransactionID, CustomerID, ProductID, RetailPrice, Quantity) VALUES (55488855, 121, 62223335, 1, 1);

Select * FROM OTTAWA.Customers WHERE CUSTOMERID = 130;
```

The bottom pane shows the results of the query, displaying a single row of data from the OTTAWA.Customers table:

CUSTOMERID	FIRSTNAME	LASTNAME	ADDRESS	CITY	PROVINCE	POSTALCODE	PHONENUMBER
1	130	Tamar	Egorova	6665 Kiseleva Way	Seren	MN	55488855

The status bar at the bottom indicates 'Query executed successfully.' and 'MIA-SQL (14.0 RTM) ADVENTUREWORKS/Student... RETAILSALES 00:00:00 1 rows'.

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The screenshot displays the Microsoft SQL Server Enterprise Manager interface. The left pane shows the Object Explorer with the RETAILSALES database selected. The center pane shows a query window with the following SQL script:

```
INSERT INTO OTTAWA.Customers (CustomerID, FirstName, LastName, Address, City, Province, PostalCode, PhoneNumber) VALUES (130, 'John', 'Doe', '123 Main St', 'Ottawa', 'ON', 'K1A 1A1', '555-1234');

INSERT INTO OTTAWA.Suppliers (SupplierID, SupplierName, Address, City, Province, PostalCode, PhoneNumber) VALUES (8859992, 'Kalmid Corp', '1 Staheld Way', 'Cal', 'YK', 'CBA LIE', '332 654-7895');

INSERT INTO OTTAWA.Products (ProductID, Description, Cost, RetailPrice, SupplierID) VALUES (62223335, 'Projector Screen 100', 51.00, 109.96, 8859992);

INSERT INTO OTTAWA.Transactions (TransNum, CustomerID, ProductID, RetailPrice, Quantity) VALUES (55488855, 121, 62223335, 1, 1);

Select * FROM OTTAWA.Customers WHERE CUSTOMERID = 130;

Select * FROM OTTAWA.SUPPLIERS WHERE SUPPLIERID = 8859992;

Select * FROM OTTAWA.PRODUCTS WHERE PRODUCTID = 62223335;
```

The right pane shows the Results tab with the following data:

SUPPLIERID	SUPPLIERNAME	ADDRESS	CITY	PROVINCE	POSTALCODE	PHONENUMBER
8859992	Kalmid Corp	1 Staheld Way	Cal	YK	CBA LIE	332 654-7895

The bottom status bar indicates the query was executed successfully, returning 1 row.

The second screenshot shows the same query window with the following SQL script:

```
INSERT INTO OTTAWA.Customers (CustomerID, FirstName, LastName, Address, City, Province, PostalCode, PhoneNumber) VALUES (130, 'John', 'Doe', '123 Main St', 'Ottawa', 'ON', 'K1A 1A1', '555-1234');

INSERT INTO OTTAWA.Suppliers (SupplierID, SupplierName, Address, City, Province, PostalCode, PhoneNumber) VALUES (8859992, 'Kalmid Corp', '1 Staheld Way', 'Cal', 'YK', 'CBA LIE', '332 654-7895');

INSERT INTO OTTAWA.Products (ProductID, Description, Cost, RetailPrice, SupplierID) VALUES (62223335, 'Projector Screen 100', 51.00, 109.96, 8859992);

INSERT INTO OTTAWA.Transactions (TransNum, CustomerID, ProductID, RetailPrice, Quantity) VALUES (55488855, 121, 62223335, 1, 1);

Select * FROM OTTAWA.Customers WHERE CUSTOMERID = 130;

Select * FROM OTTAWA.SUPPLIERS WHERE SUPPLIERID = 8859992;

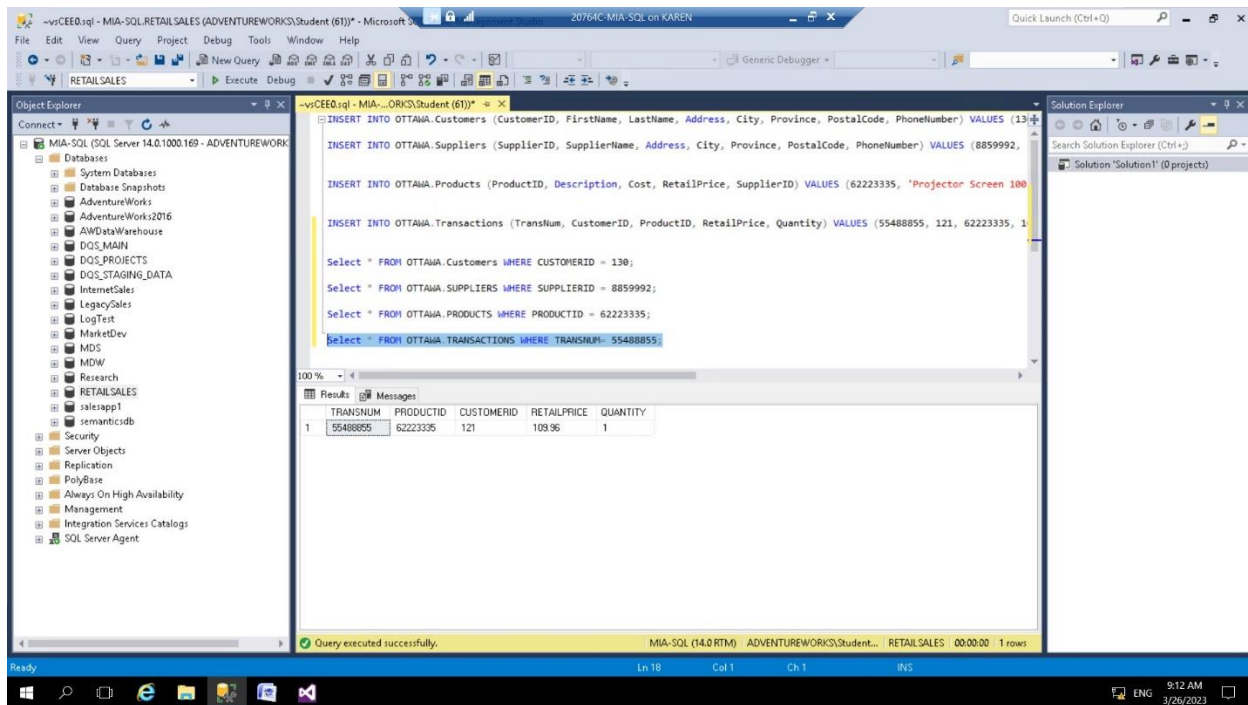
Select * FROM OTTAWA.PRODUCTS WHERE PRODUCTID = 62223335;
```

The right pane shows the Results tab with the following data:

PRODUCTID	DESCRIPTION	COST	RETAILPRICE	SUPPLIERID
62223335	Projector Screen 100 Inch 16.9	51.00	109.96	8859992

The bottom status bar indicates the query was executed successfully, returning 1 row.

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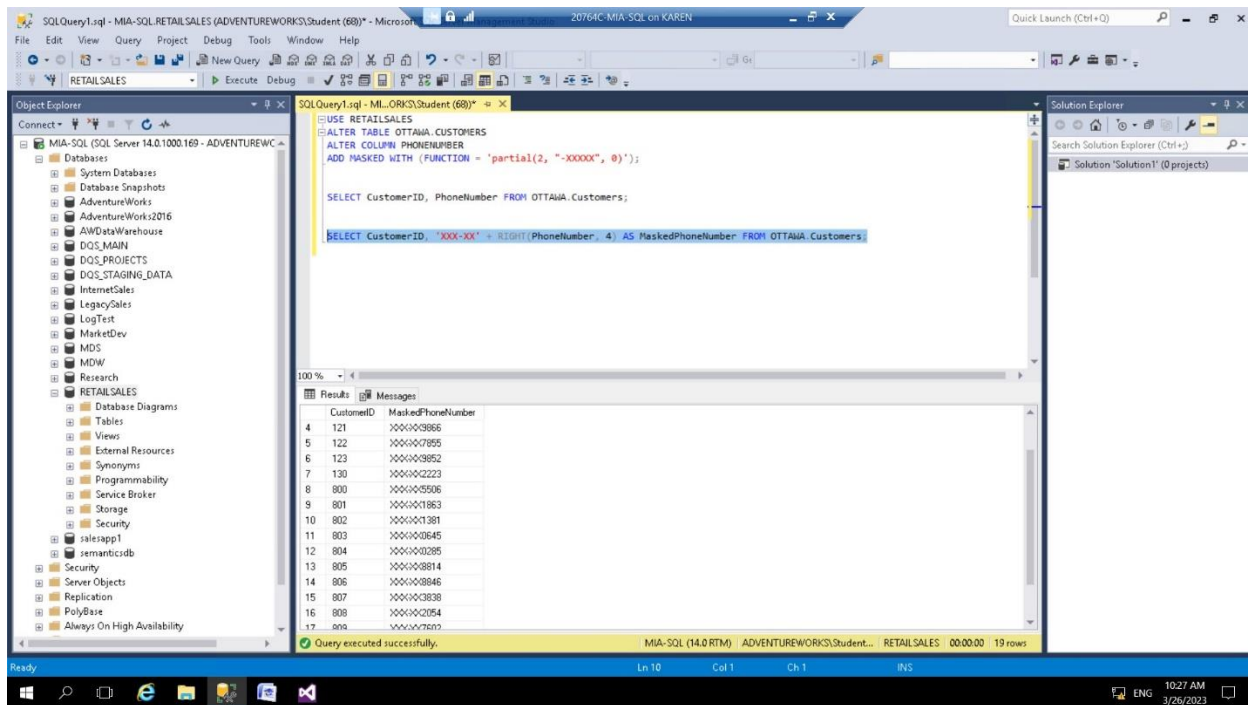
Security

- Create a **dynamic display mask** that hides the Customer Phone Numbers in the Customers table
- **Encrypt** the Cost field in the Products table
- Create a **dynamic display mask** that hides the address information in the Suppliers table

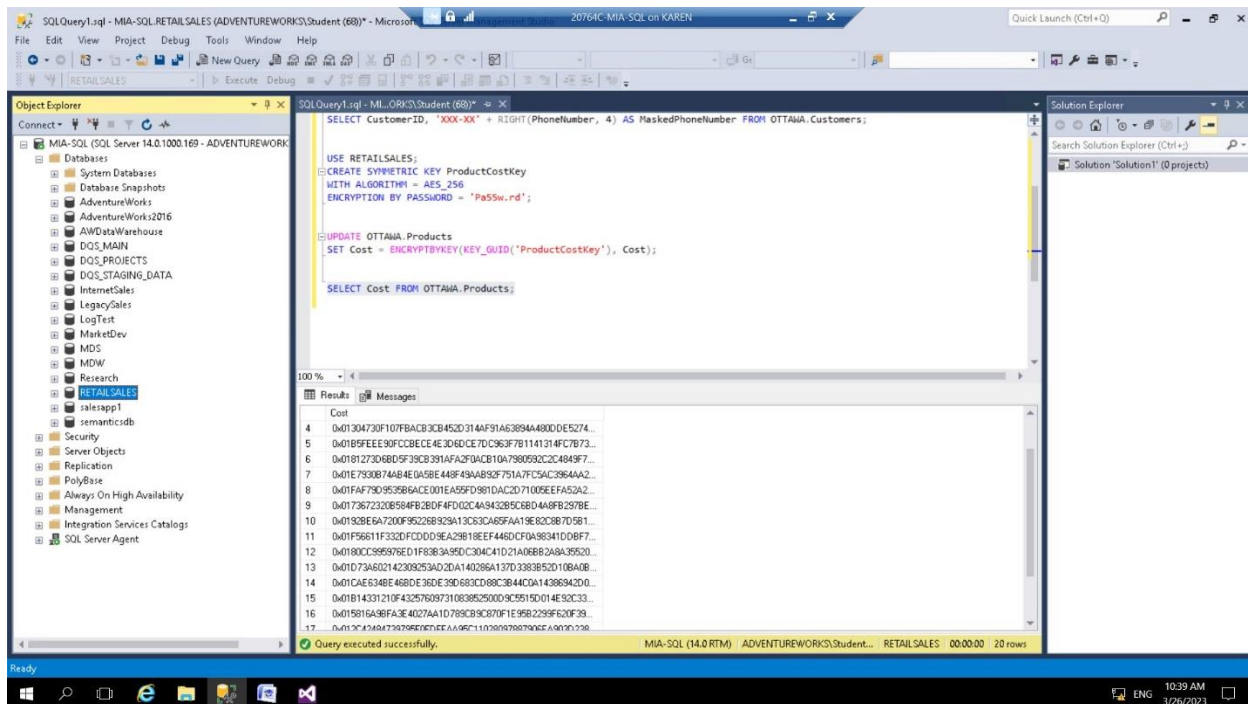
Query

- Run a query that shows the information in the Customers table has been masked
 - Take a screenshot
 - Note: Do not show me the unmasked data

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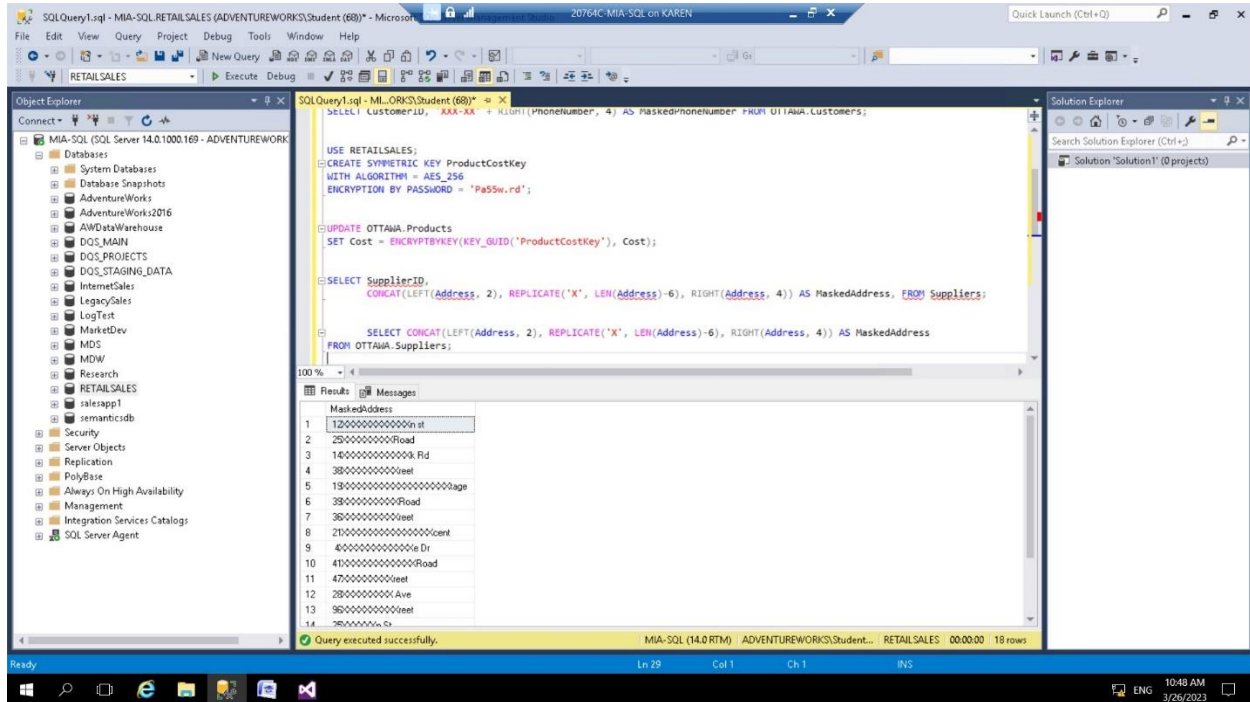
- Run a query showing that the cost field in the Products table has been encrypted
 - Take a screenshot



- Run a query showing that the Suppliers address information is masked

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- Take a screenshot
- Note: Do not show me the unmasked data



Submission

Screenshots of the successful completion of all your queries are required. You may paste the screenshots in the individual “Query” sections of this document.

You are also required to provide screenshots of the backup files that you created.

You must also include all the Transact-SQL syntax used.

ALL TRANSACT-SQL USED

USE RETAILSALLES;

```
INSERT INTO ottawa.Customers (CustomerID, FirstName, LastName, Address, City, Province, PostalCode,
PhoneNumber)
```

```
INSERT INTO Ottawa.Suppliers (SupplierID, SupplierName, Address, City, Province, PostalCode,
PhoneNumber) VALUES
```

```
INSERT INTO OTTAWA.Products (ProductID, Description, Cost, RetailPrice, SupplierID)
VALUES
```


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```
INSERT INTO OTTAWA.Transactions (TransNum, CustomerID, ProductID, RetailPrice, Quantity)
VALUES
```

```
SELECT * FROM OTTAWA.CUSTOMERS
```

```
SELECT * FROM OTTAWA.SUPPLIERS
```

```
SELECT * FROM OTTAWA.PRODUCTS
```

```
SELECT * FROM OTTAWA.TRANSACTIONS
```

```
SELECT TOP(5) * FROM OTTAWA.CUSTOMERS
```

```
SELECT TOP(1) * FROM OTTAWA.SUPPLIERS ORDER BY SUPPLIERID DESC
```

```
SELECT table_name FROM information_schema.tables WHERE table_schema = 'OTTAWA';
```

```
Select * FROM OTTAWA.CUSTOMERS WHERE CUSTOMERID = 130;
```

```
Select * FROM OTTAWA.SUPPLIERS WHERE SUPPLIERID = 8859992;
```

```
Select * FROM OTTAWA.PRODUCTS WHERE PRODUCTID = 62223335;
```

```
Select * FROM OTTAWA.TRANSACTIONS WHERE TRANSNUM= 55488855;
```

```
USE RETAILSales
```

```
ALTER TABLE OTTAWA.CUSTOMERS
```

```
ALTER COLUMN PHONENUMBER
```

```
ADD MASKED WITH (FUNCTION = 'partial(2, "-XXXXX", 0)');
```

```
USE RETAILSales
```

```
ALTER TABLE OTTAWA.SUPPLIERS
```

```
ALTER COLUMN ADDRESS
```

```
ADD MASKED WITH (FUNCTION = 'partial(2, "-XXXXX", 0)');
```

```
SELECT CustomerID, 'XXX-XX' + RIGHT(PhoneNumber, 4) AS MaskedPhoneNumber
FROM OTTAWA.Customers;
```

```
SELECT CONCAT(LEFT(Address, 2), REPLICATE('X', LEN(Address)-6), RIGHT(Address, 4)) AS
MaskedAddress
```

```
FROM OTTAWA.Suppliers;
```