AIST 3410- Database Management System

Description:

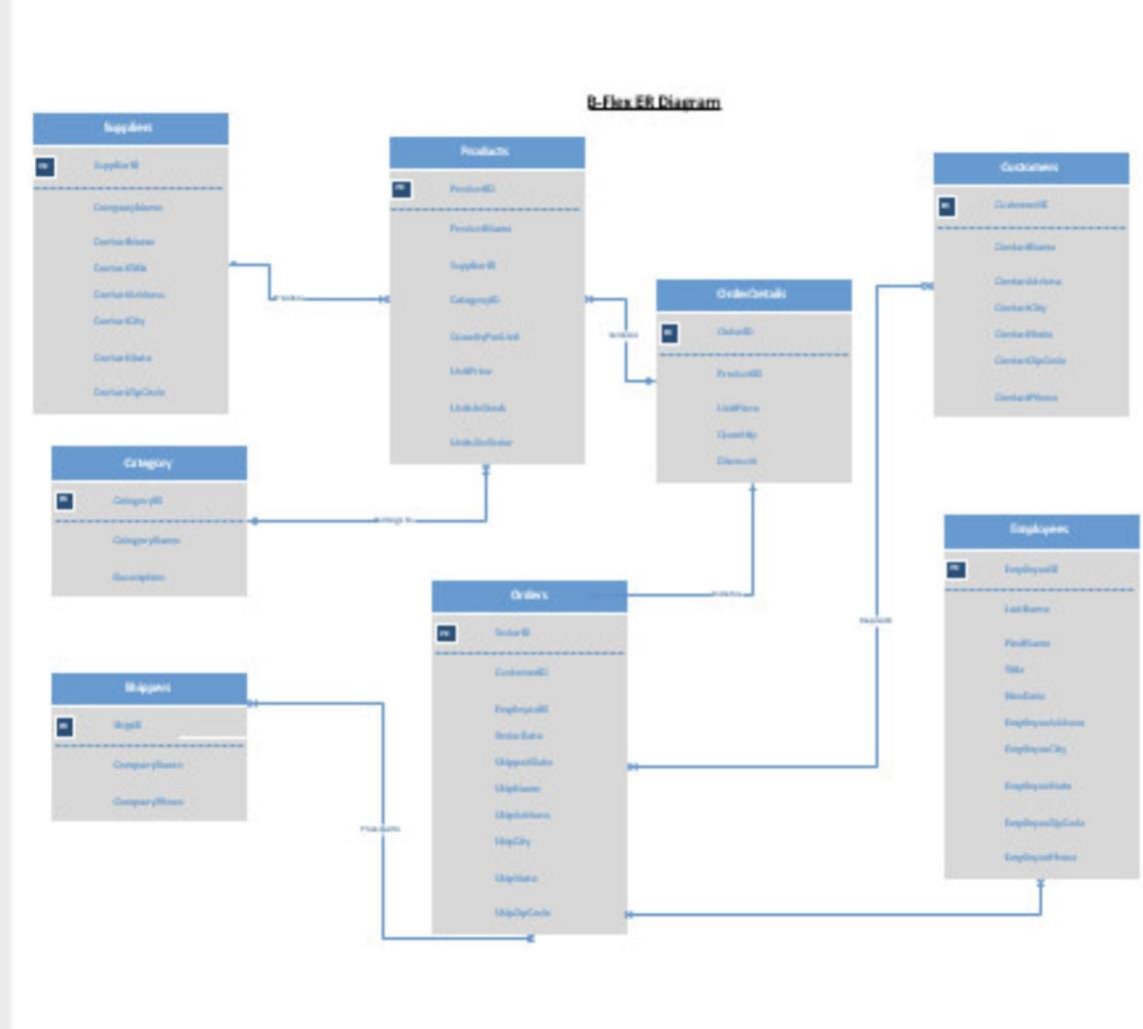
For our project, we selected a locally owned company known as B-Flex. The company was born in Italy more than a decade ago, and has continued to grow exponentially over the past few years. So much, that they decide to globalize and bring their products to the United States. The company is known for the sale of 'wholesale heat vinyl transfer' and swear by their products.

Although B-Flex Italia has been established for quite some time, B-Flex United States has only been active in our market for a little over a year. The company is still starting and lacks a strong connection between its data. Information is hard to access, therefore making it difficult to retrieve, manipulate, and produce information. The company's current file system lacks the ability to manage large amounts of data, accuracy, security, and easy to reach/update data.

The purpose of our newly designed database is to enhance the company's ability to not only store their large amounts of data, but also help to efficiently handle that data in a faster manner while performing multiple tasks with ease. The database will also help to reduce or even avoid altogether data redundancy. Our goal for this project is to provide this semi 'start-up' company with a more reliable way to share and communicate their data among themselves while ensuring accuracy and consistency in the database.

The database will include: Customers requesting orders, products in stock, and employees handling orders. There will also be tables categorizing products as well as tables organizing shipping companies. Our goal for this project is to provide this semi 'start-up' company with a more reliable way to share and communicate their data among themselves while ensuring accuracy and consistency in the database.

E-R Diagram (Conceptual Data Model)



The image from the screenshot made the picture very blurry. The ER model can be found saved on Devin's virtual machine on the Desktop

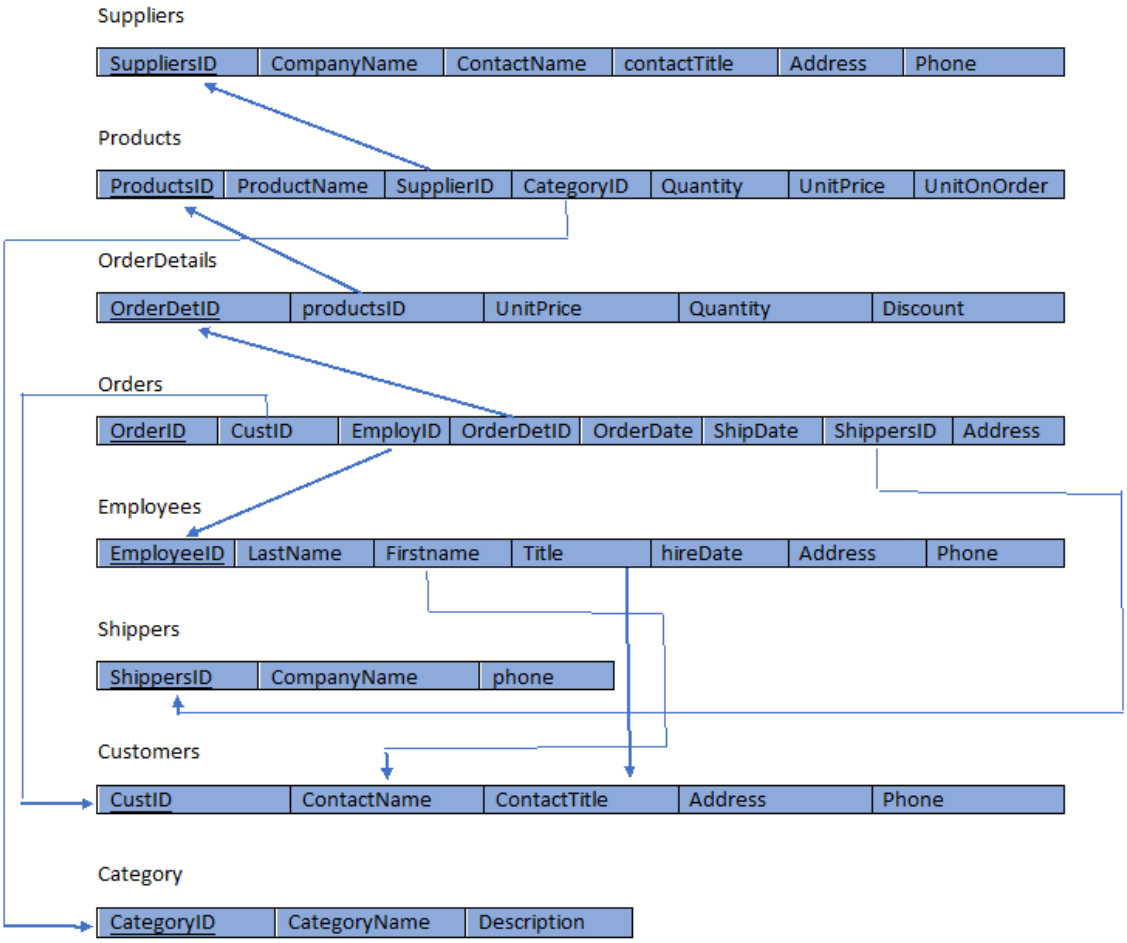
ER Diagram Explanation:

The ER model is designed to show the relationship between the entities within the company, B-Flex. The entities we chose to use for our design include; Customers, Employees, Orders, OrderDetails, Products, Categories, Suppliers and Shippers. There is a total of 8 tables. The primary key for all entities consists of a unique ID. For example, the entity Customers has a primary key of CustomerID, the entity Products has the primary key ProductsID, and so on and so forth. The attributes for each table are the properties which are used to define the entity type. Each entity has a minimum of 3 attributes.

As mentioned previously, the entity Customers has a primary key, CustomerID, along with the attributes: CompanyName, ContactName, ContactAddress, ContactCity, and ContactPhone. The entity Employees has a primary key, EmployeeID, along with the attributes: LastName, FirstName, Title, HireDate, EmployeeAddress, EmployeeCity, EmployeeState, EmployeeZipCode and EmployeePhone. The entity Orders has the primary key, OrderID, along with the foreign keys CustomerID and EmployeeID. The other attributes in the Order table aside from the primary and foreign keys include; OrderDate, ShippedDate, ShipName, ShipAddress, ShipCity, ShipState and ShipZipCode. The entity OrderDetails uses the OrderID from the Orders table and the ProductID from the Products table as foreign keys. Because the table uses only foreign keys for identification, the table is considered a weak entity.

Lastly, are the remaining entities, Products, Category, Suppliers and Shippers. The entity Products has a primary key, ProductID, and two foreign keys, SupplierID and CategoryID. The remaining attributes in Products are ProductName, QuanityPerUnit, UnitPrice and UnitsOnOrder. The entity Suppliers has a primary key, SupplierID, along with attributes; CompanyName, ContactName, ContactTitle, ContactAddress, ContactCity, ContactState, ContactZipCode, ContactPhone. The entitities Category and Shippers have the least number of attributes. Products has a primary key, CategoryID, and the attributes CompanyName and description. Shippers has a primary key, ShipperID, and the attributes CompanyName and CompanyPhone.

Relational Model (Logical Data Model)

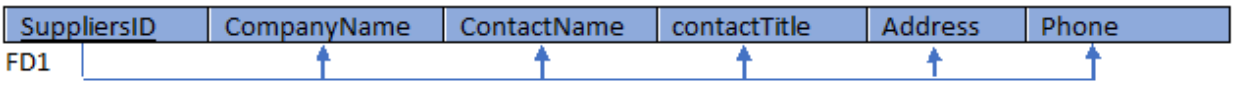


Relational Model Explanation:

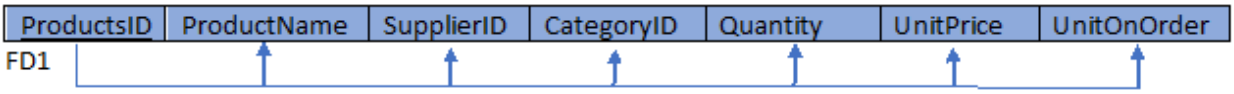
The relational model represents to database as a collection of relations (tables). It is just the table with the associated values. Each row represents a collection of related data values. Each relation has a header, our headers are the same columns used in the ER model and in our database. The body is the set of data that populates the relation, organized into rows. We followed the rules of primary and foreign keys.

Normalization

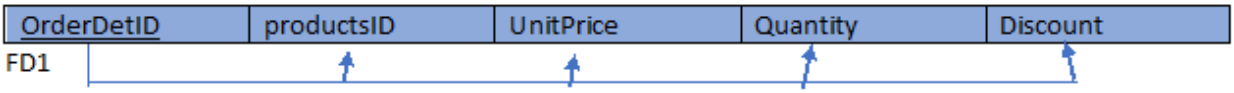
Suppliers



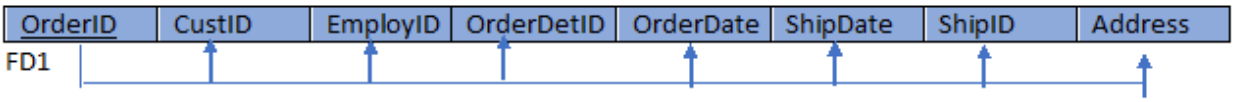
Products



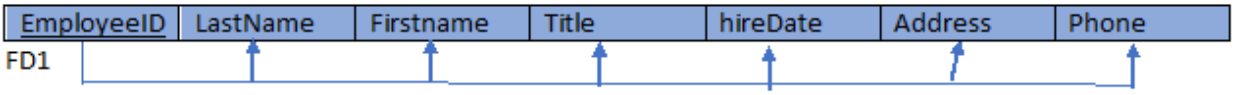
OrderDetails



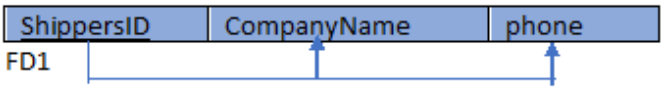
Orders



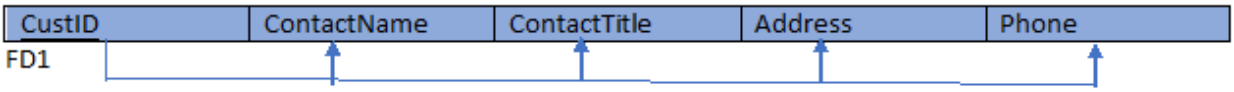
Employees



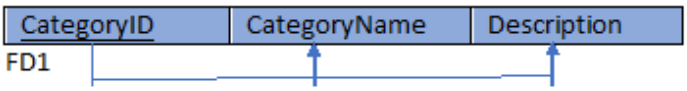
Shippers



Customers

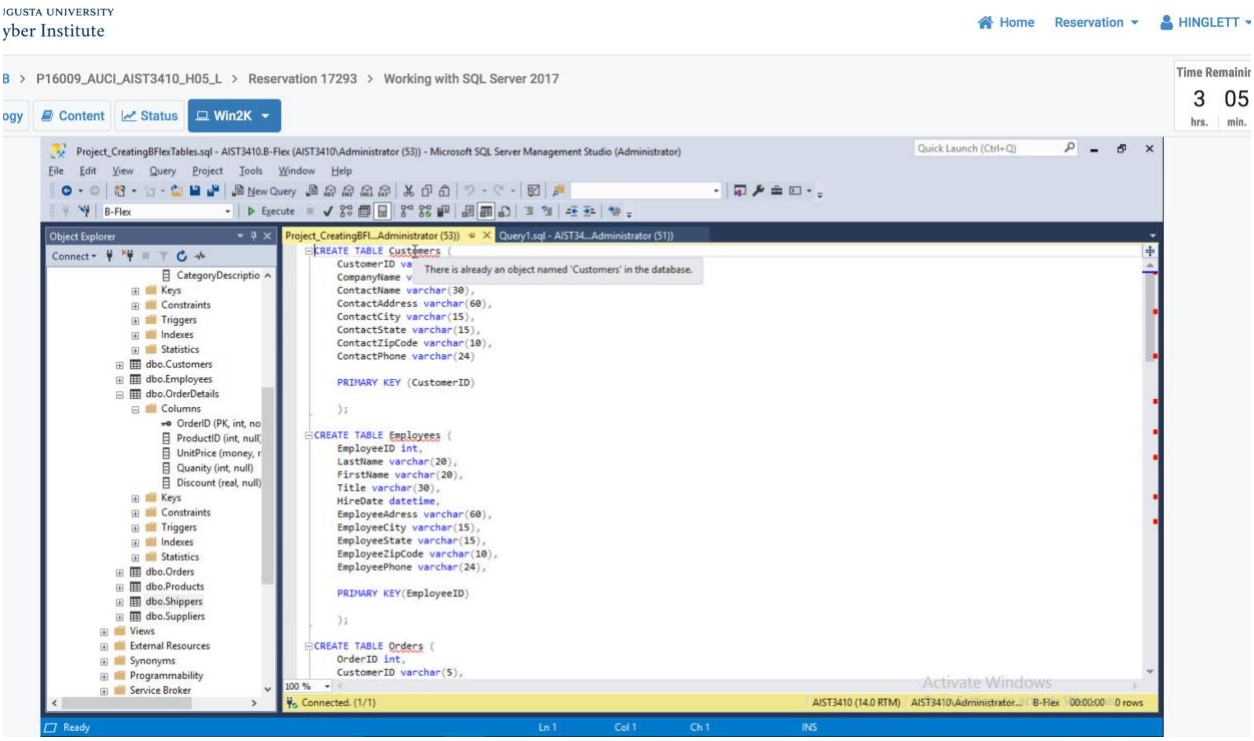


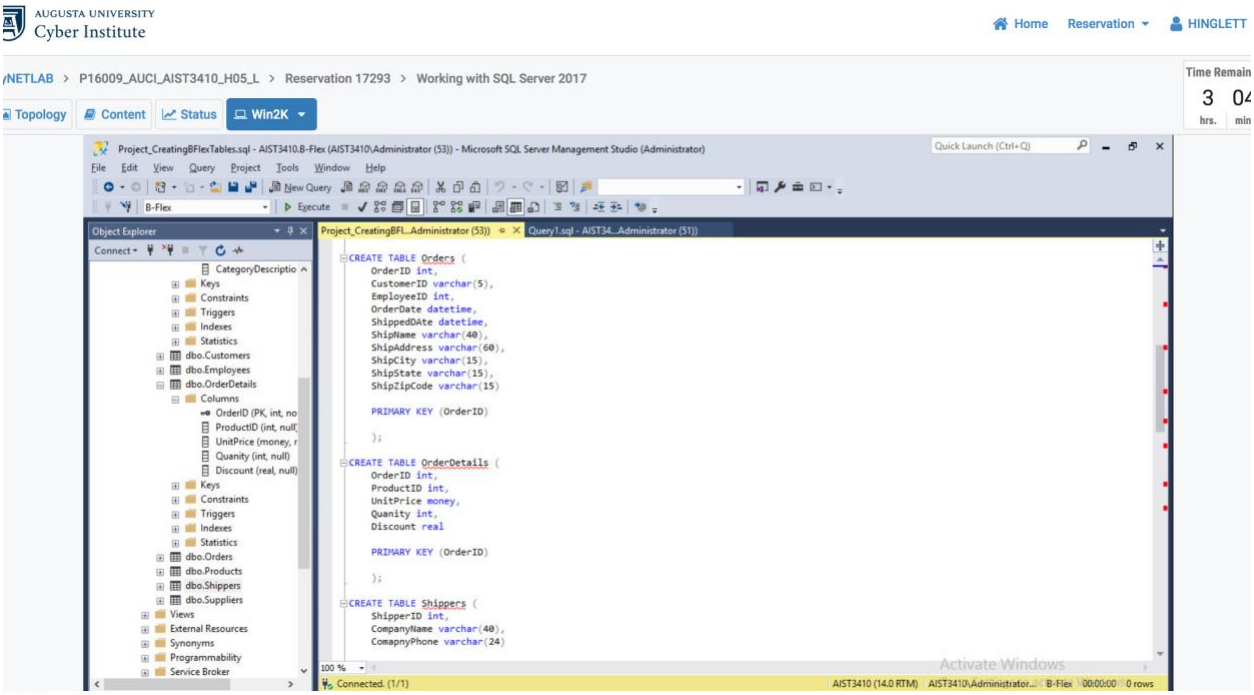
Category

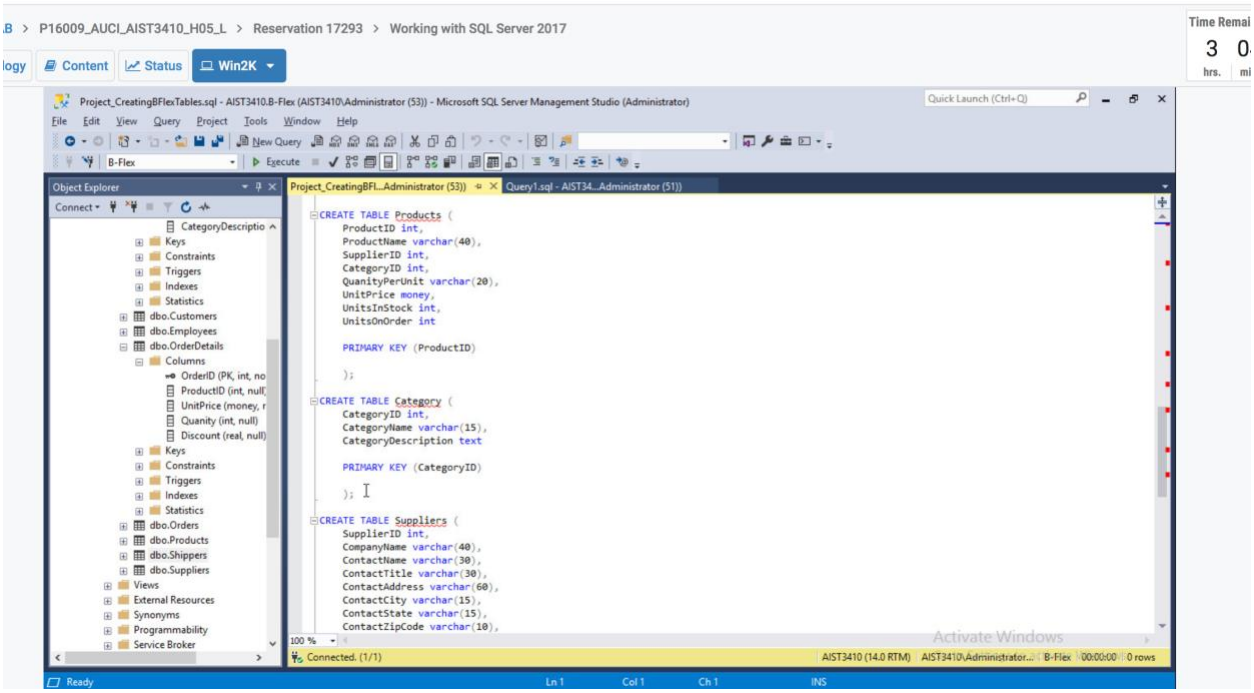


Database in SQL Server

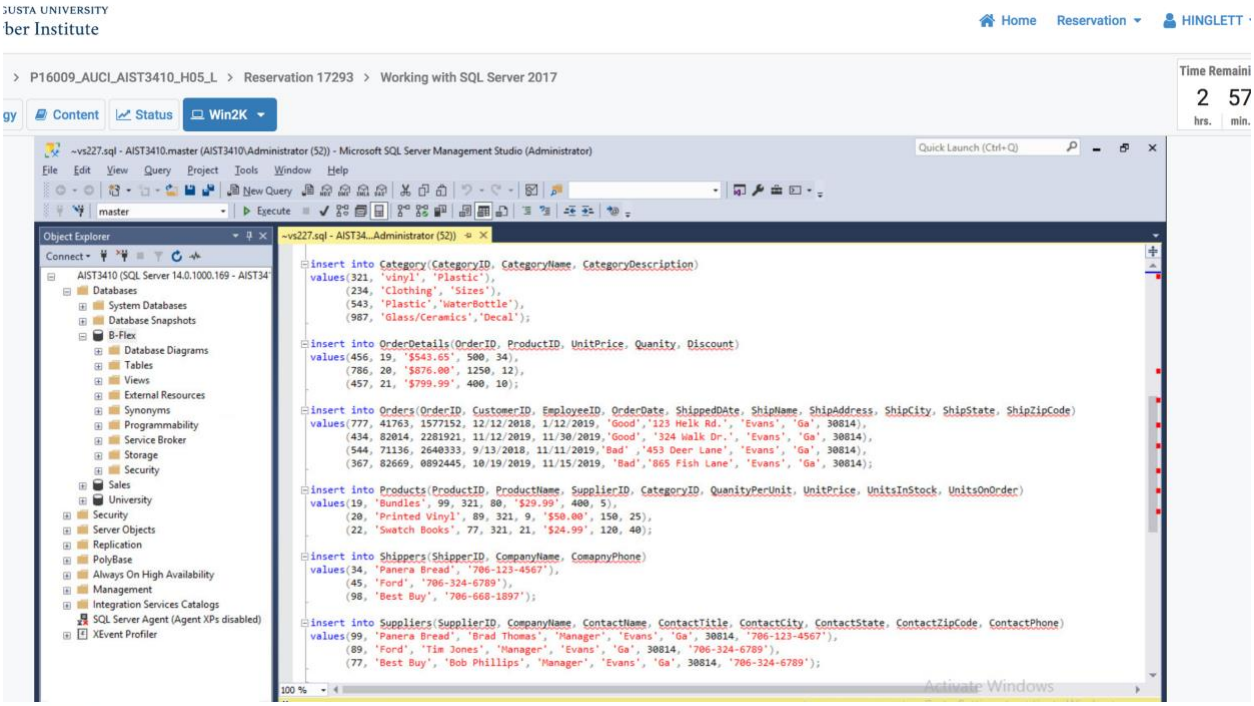
Step 1.) To create the database inside the SQL server, we left clicked on 'Databases' inside of the Object Explorer. Here, we named our new database 'B-Flex'. Inside of a new query is where we began by creating each table from the relational model. These saved queries can be found in Haley's virtual machine saved inside the folder 'Final'.

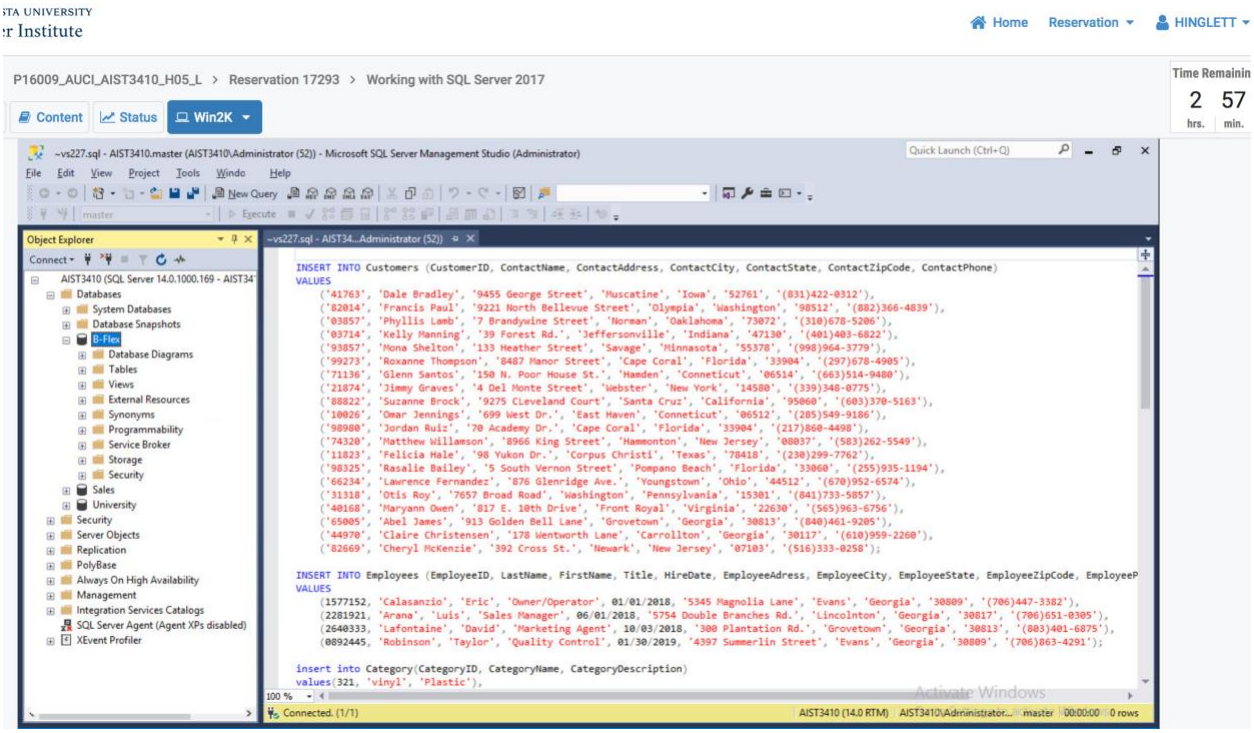




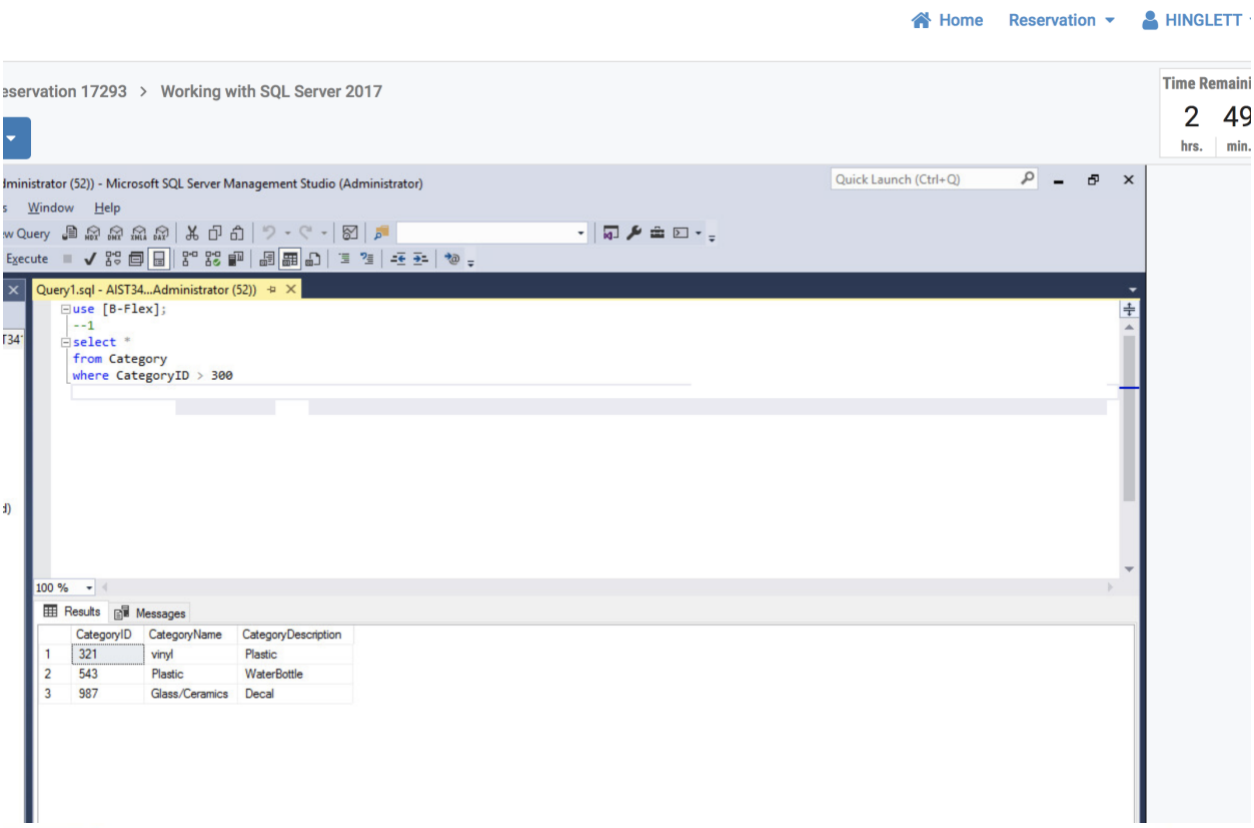


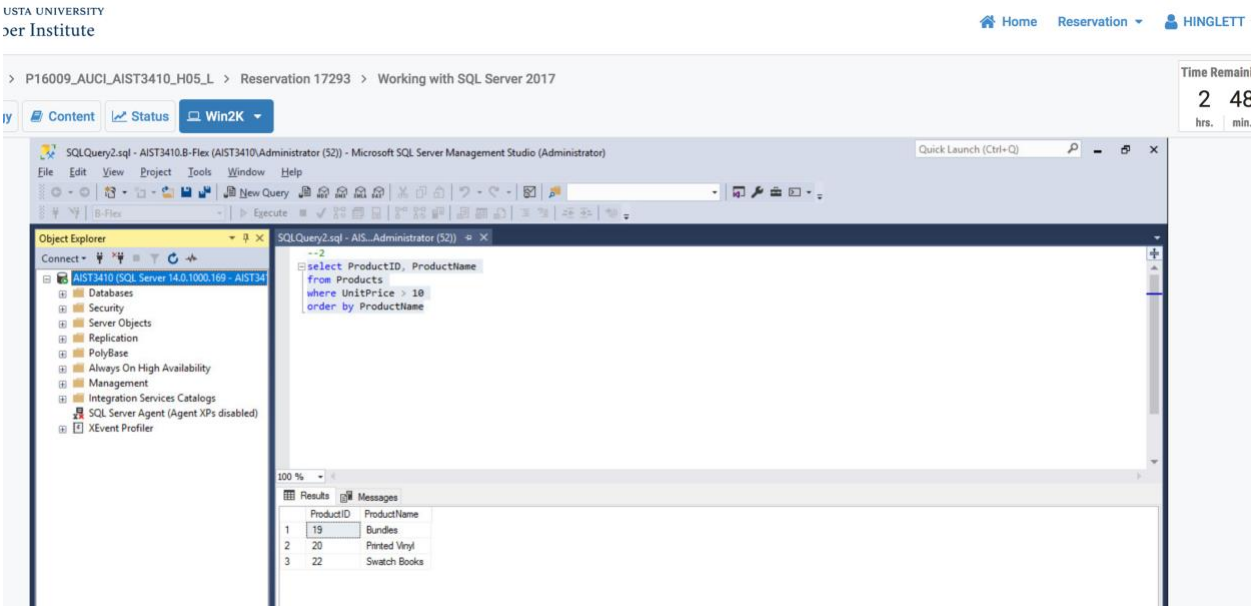
Step 2.) After creating each table in the B-Flex database, we had to insert data into each table. As you can see in the Customers table, we started to insert a lot of data (20 rows). We decided having this much data was unnecessary and not needed to prove the point or functionality of the database. Therefore, the remaining tables only have roughly 4 rows of data.





Step 3.) Once all the data was inserted into the tables inside of the database, we created 12 SQL queries to ensure that data could be extracted correctly. Below are screenshots of each query executed.


Home
Reservation
HINGLETT
eservation 17293 > Working with SQL Server 2017
Time Remaini
2 49
hrs. min.
Quick Launch (Ctrl+Q)
Window Help
Execute
Query1.sql - AIST34...Administrator (52))
use [B-Flex];
--1
select *
from Category
where CategoryID > 300
100 %
Results
Messages
CategoryID CategoryName CategoryDescription
1 321 vinyl Plastic
2 543 Plastic WaterBottle
3 987 Glass/Ceramics Decal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File Edit View Project Tools Window Help
New Query
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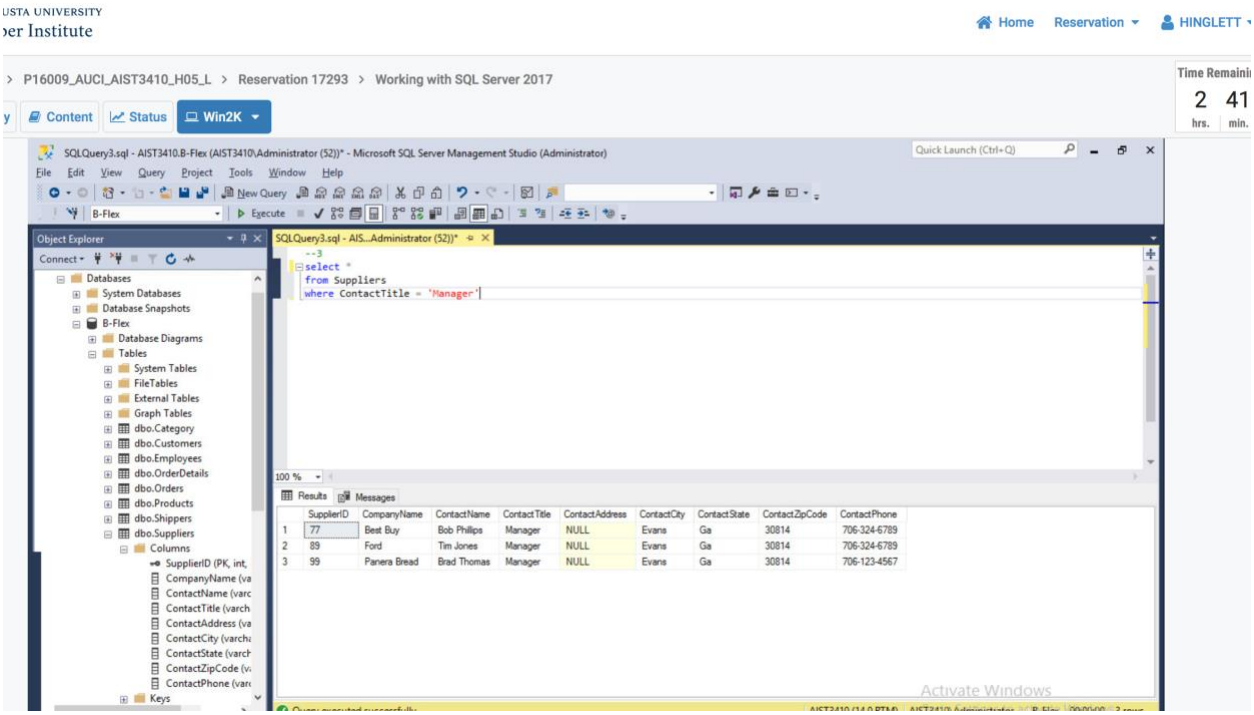
Object Explorer
Connect
Databases
Security
Server Objects
Replication
PolyBase
Always On High Availability
Management
Integration Services Catalogs
SQL Server Agent (Agent XPs disabled)
XEvent Profiler
SQLQuery2.sql - AIS...Administrator (52))
--2
select ProductID, ProductName
from Products
where UnitPrice > 10
order by ProductName
100 %
Results
Messages
ProductID ProductName
1 19 Bundles
2 20 Printed Vinyl
3 22 Swatch Books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hrs. min.
SQLQuery3.sql - AIST3410.B-Flex (AIST3410\Administrator (52))* - Microsoft SQL Server Management Studio (Administrator)
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New Query
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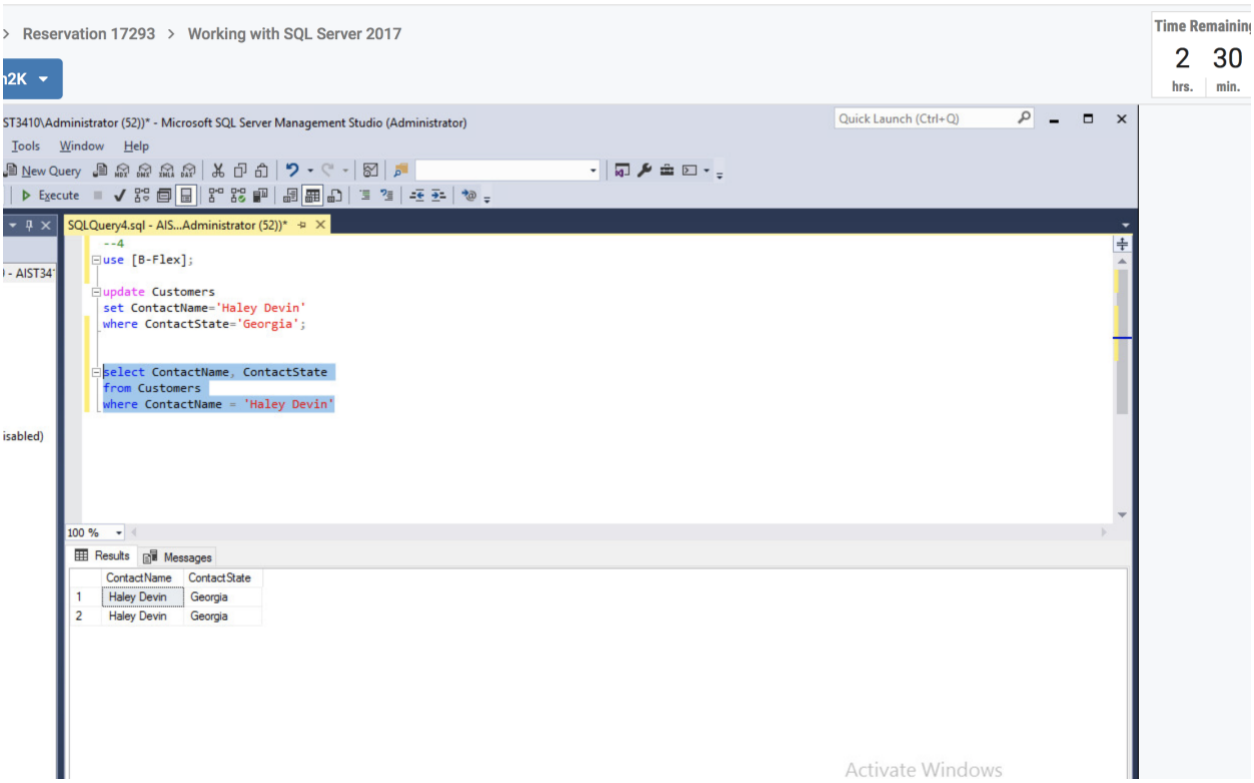
B-Flex
Object Explorer
Connect
Databases
System Databases
Database Snapshots
B-Flex
Database Diagrams
Tables
System Tables
FileTables
External Tables
Graph Tables
dbo.Category
dbo.Customers
dbo.Employees
dbo.OrderDetails
dbo.Orders
dbo.Products
dbo.Shippers
dbo.Suppliers
Columns
SupplierID (PK, int,
CompanyName (va
ContactName (varc
ContactTitle (varch
ContactAddress (va
ContactCity (varch
ContactState (varch
ContactZipCode (v
ContactPhone (varc
Keys
SQLQuery3.sql - AIS...Administrator (52))*
--3
select *
from Suppliers
where ContactTitle = 'Manager'
100 %
Results
Messages
SupplierID CompanyName ContactName ContactTitle ContactAddress ContactCity ContactState ContactZipCode ContactPhone
1 77 Best Buy Bob Phillips Manager NULL Evans Ga 30814 706-324-6789
2 89 Ford Tim Jones Manager NULL Evans Ga 30814 706-324-6789
3 99 Panera Bread Brad Thomas Manager NULL Evans Ga 30814 706-123-4567
Activate Windows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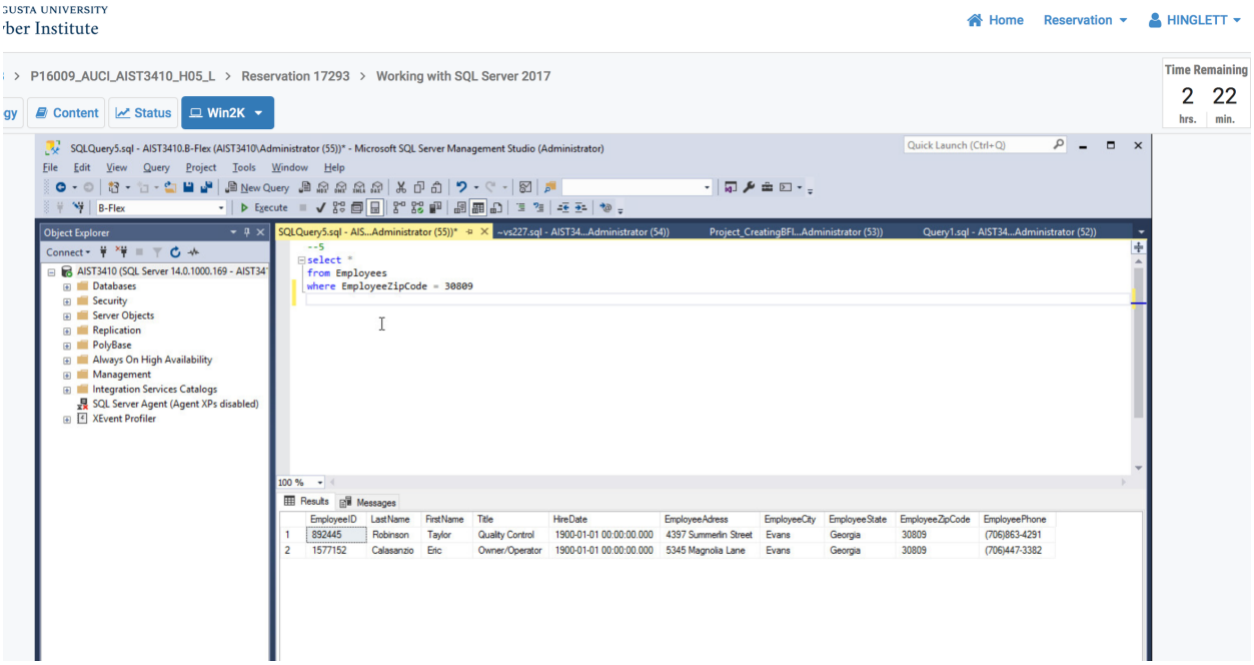
ST3410\Administrator (52))* - Microsoft SQL Server Management Studio (Administrator)
Quick Launch (Ctrl+Q)
Tools Window Help
New Query
Execute
SQLQuery4.sql - AIS...Administrator (52))*
--4
use [B-Flex];
update Customers
set ContactName='Haley Devin'
where ContactState='Georgia';
select ContactName, ContactState
from Customers
where ContactName = 'Haley Devin'
100 %
Results
Messages
ContactName ContactState
1 Haley Devin Georgia
2 Haley Devin Georgia
Activate Windows


Home
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Time Remaining
2 hrs. 22 min.
Content
Status
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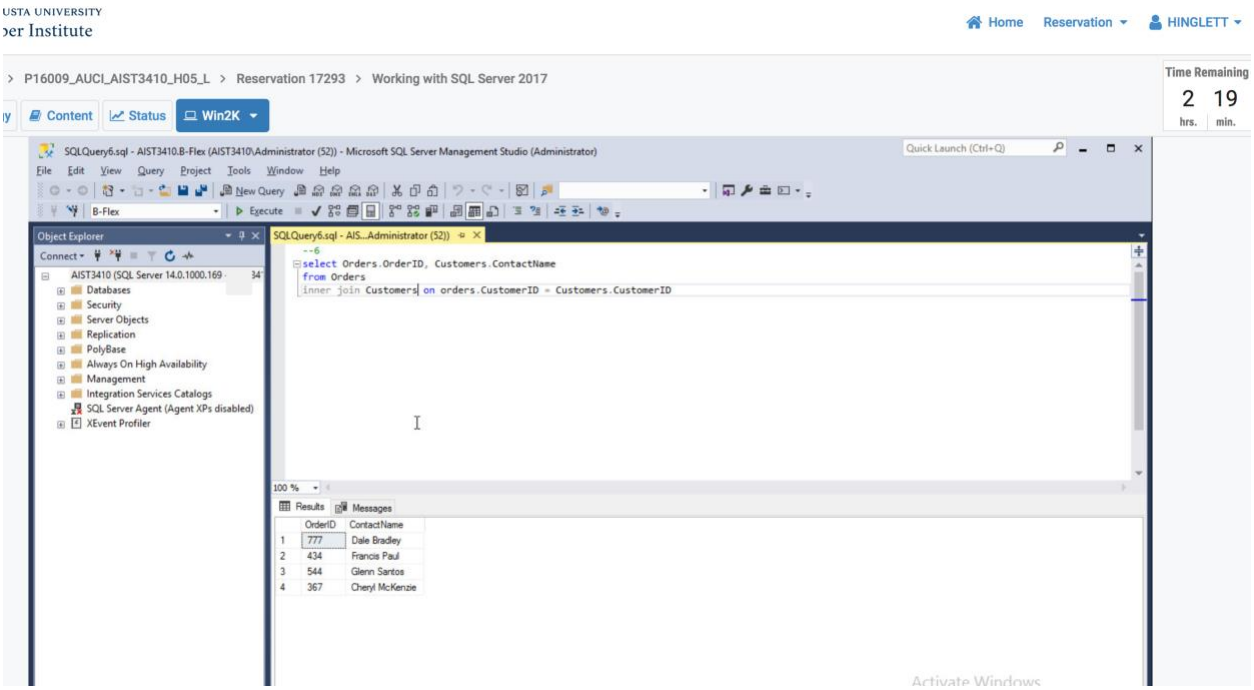
SQLQuery5.sql - AIST3410.B-Flex (AIST3410\Administrator (55))* - Microsoft SQL Server Management Studio (Administrator)
--5
select *
from Employees
where EmployeeZipCode = 30809
EmployeeID LastName FirstName Title HireDate EmployeeAdress EmployeeCity EmployeeState EmployeeZipCode EmployeePhone
1 892445 Robinson Taylor Quality Control 1900-01-01 00:00:00.000 4397 Summerlin Street Evans Georgia 30809 (706)863-4291
2 1577152 Calasanzio Eric Owner/Operator 1900-01-01 00:00:00.000 5345 Magnolia Lane Evans Georgia 30809 (706)447-3382


Home
Reservation
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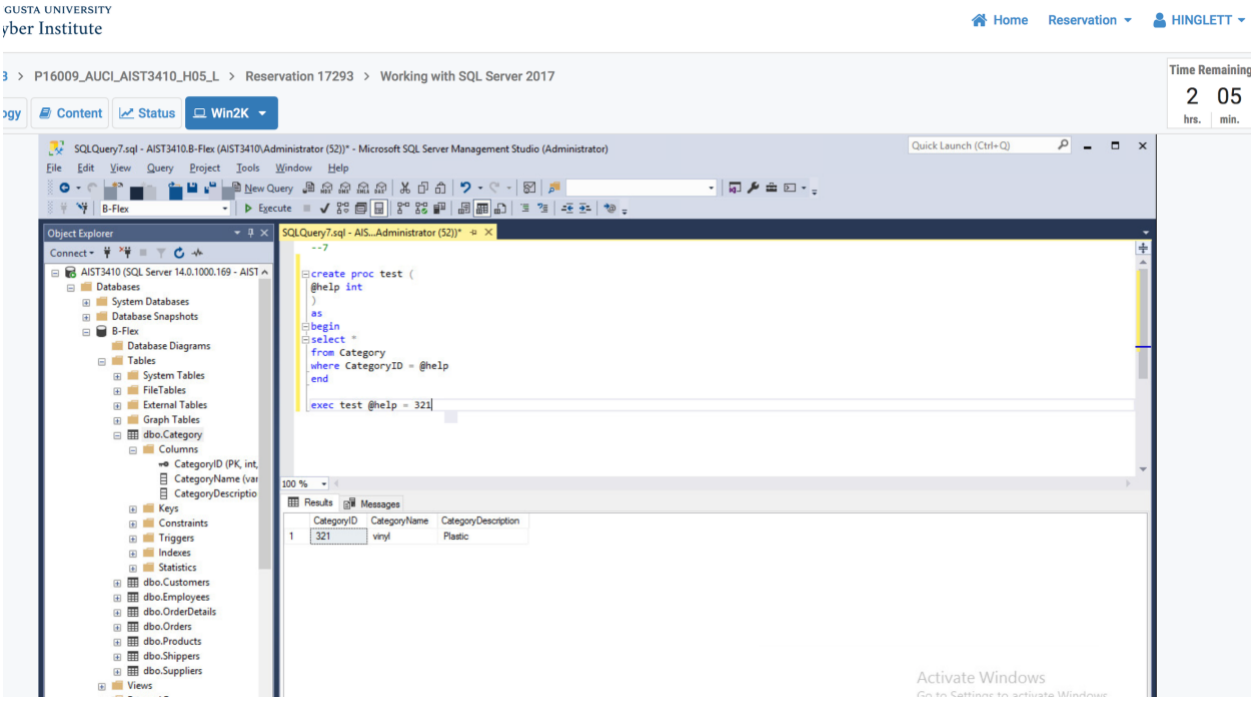
P16009_AUCI_AIST3410_H05_L > Reservation 17293 > Working with SQL Server 2017
Time Remaining
2 hrs. 19 min.
Content
Status
Win2K
SQLQuery6.sql - AIST3410.B-Flex (AIST3410\Administrator (52)) - Microsoft SQL Server Management Studio (Administrator)
--6
select Orders.OrderID, Customers.ContactName
from Orders
inner join Customers on orders.CustomerID = Customers.CustomerID
OrderID ContactName
1 777 Dale Bradley
2 434 Francis Paul
3 544 Glenn Santos
4 367 Cheryl McKenzie


GUSTA UNIVERSITY
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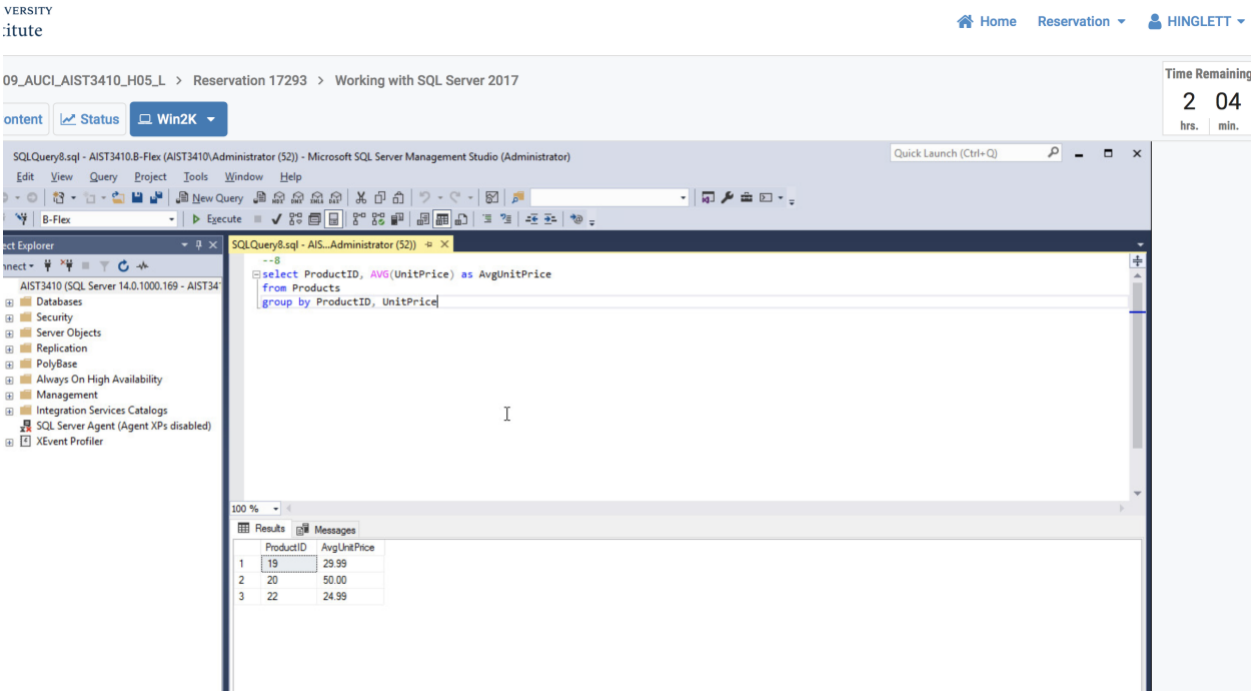
Home
Reservation
HINGLETT
> P16009_AUCI_AIST3410_H05_L > Reservation 17293 > Working with SQL Server 2017
Time Remaining
2 hrs. 05 min.
Content
Status
Win2K
SQLQuery7.sql - AIST3410.B-Flex (AIST3410\Administrator (52))* - Microsoft SQL Server Management Studio (Administrator)
Quick Launch (Ctrl+Q)
File Edit View Query Project Tools Window Help
New Query
Execute
B-Flex
Object Explorer
Connect
AIST3410 (SQL Server 14.0.1000.169 - AIST
Databases
System Databases
Database Snapshots
B-Flex
Database Diagrams
Tables
System Tables
FileTables
External Tables
Graph Tables
dbo.Category
Columns
CategoryID (PK, int,
CategoryName (var
CategoryDescriptio
Keys
Constraints
Triggers
Indexes
Statistics
dbo.Customers
dbo.Employees
dbo.OrderDetails
dbo.Orders
dbo.Products
dbo.Shippers
dbo.Suppliers
Views
SQLQuery7.sql - AIS...Administrator (52))*
--7
create proc test (
@help int
)
as
begin
select *
from Category
where CategoryID = @help
end
exec test @help = 321
100 %
Results
Messages
CategoryID CategoryName CategoryDescription
1 321 vinyl Plastic
Activate Windows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Time Remaining
2 hrs. 04 min.
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Status
Win2K
SQLQuery8.sql - AIST3410.B-Flex (AIST3410\Administrator (52)) - Microsoft SQL Server Management Studio (Administrator)
Quick Launch (Ctrl+Q)
Edit View Query Project Tools Window Help
New Query
Execute
B-Flex
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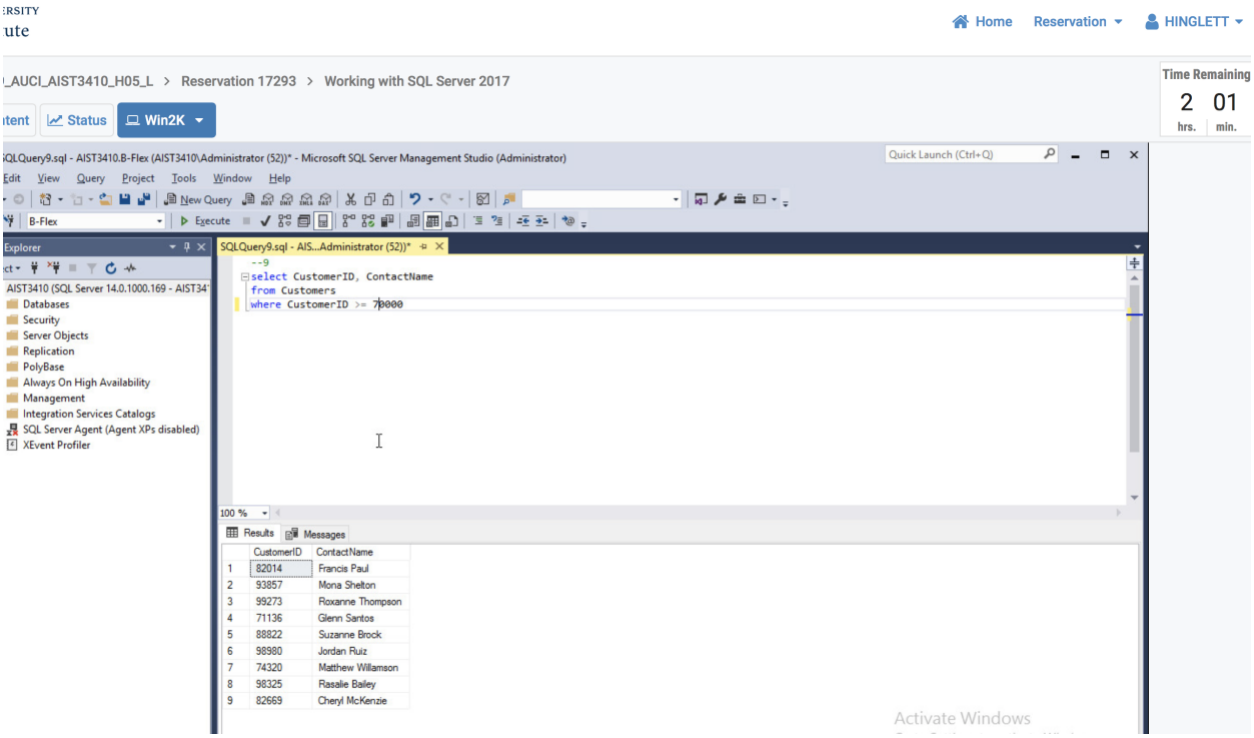
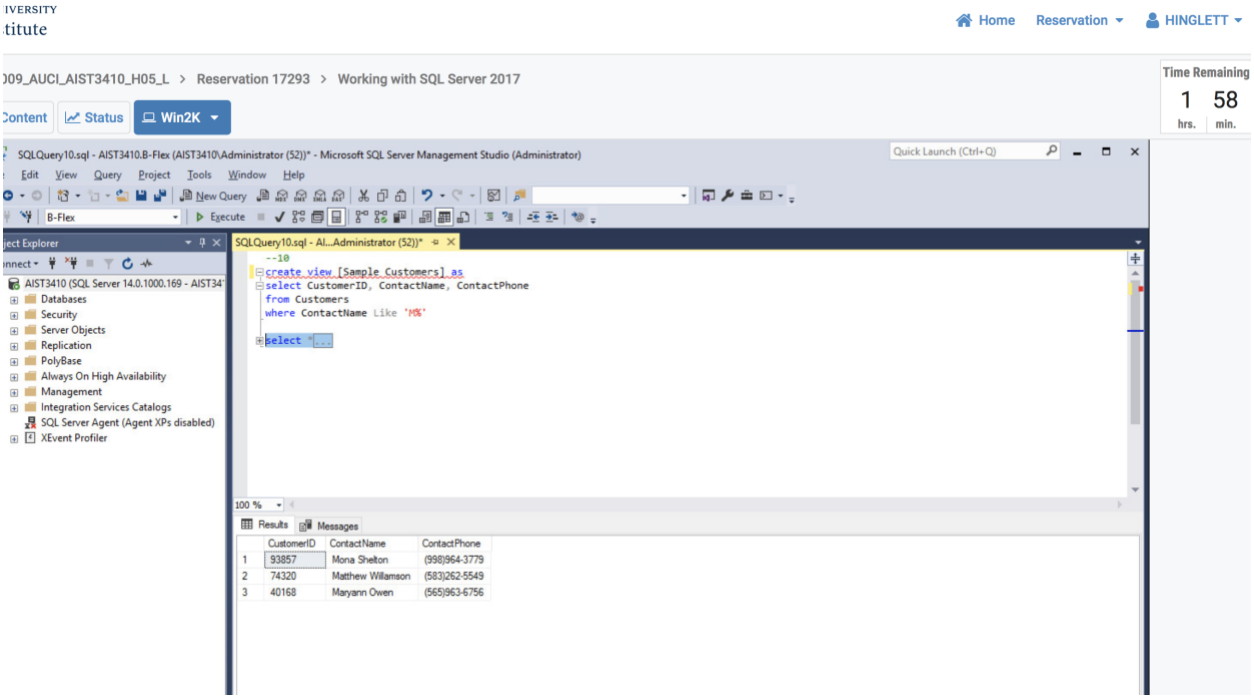
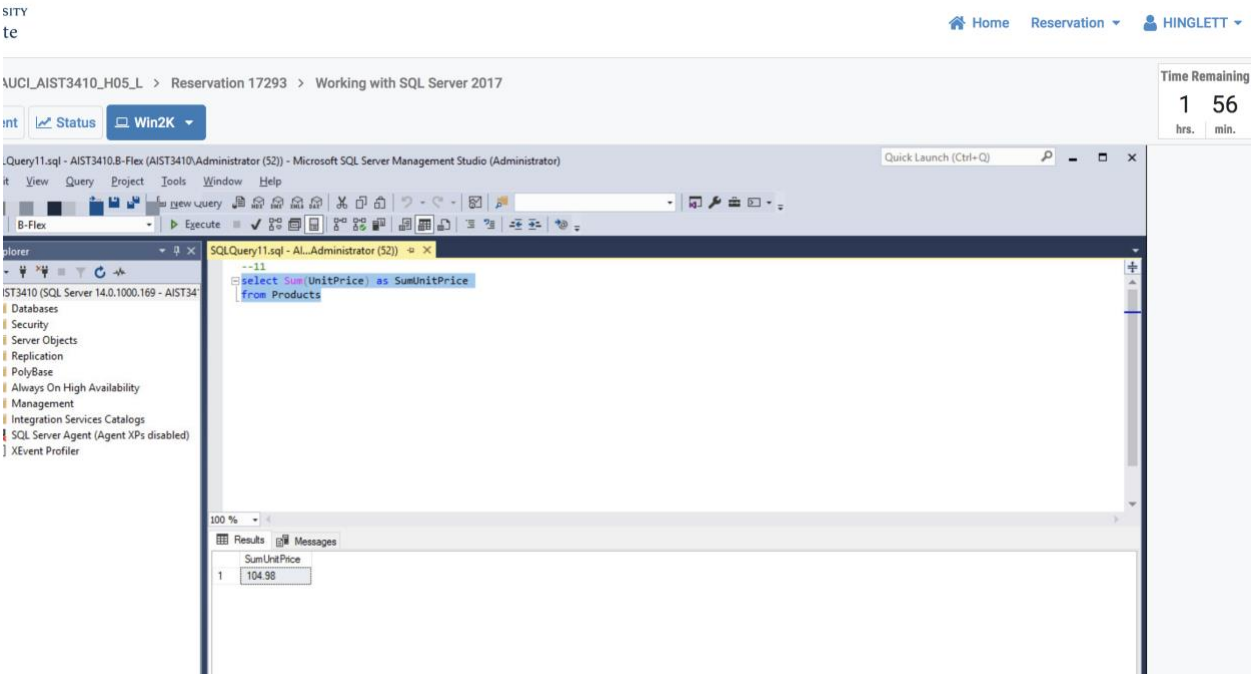
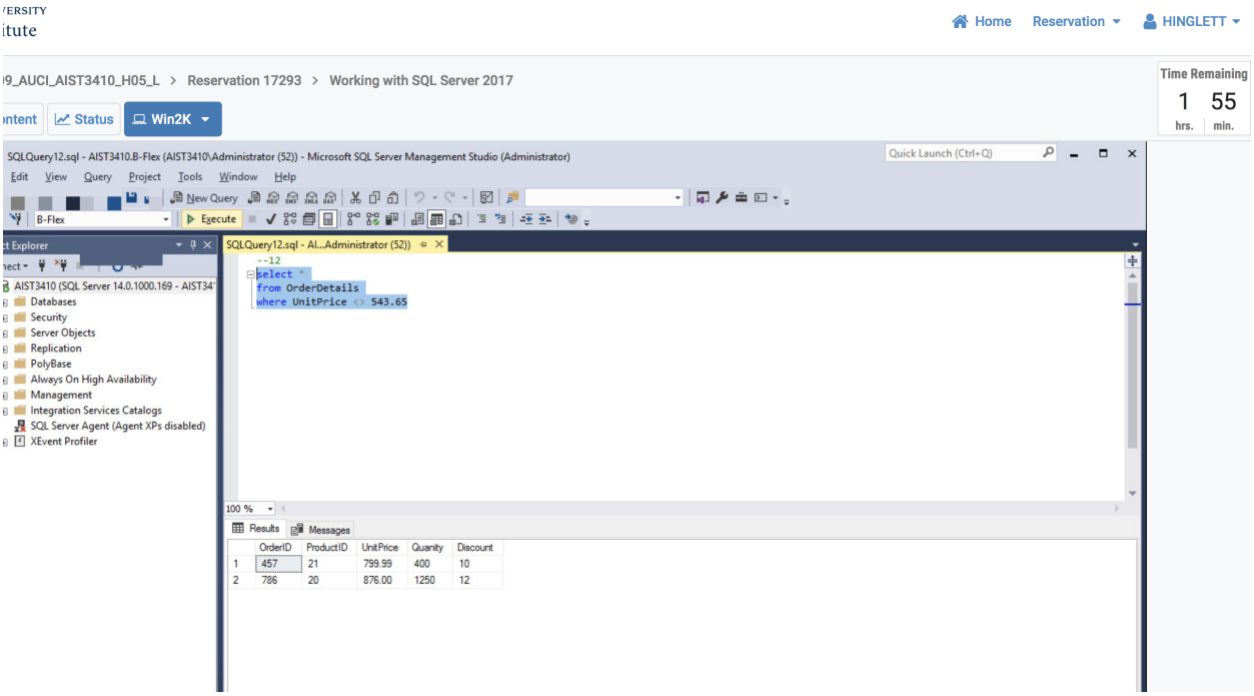
AIST3410 (SQL Server 14.0.1000.169 - AIST34
Databases
Security
Server Objects
Replication
PolyBase
Always On High Availability
Management
Integration Services Catalogs
SQL Server Agent (Agent XPs disabled)
XEvent Profiler
SQLQuery8.sql - AIS...Administrator (52))
--8
select ProductID, AVG(UnitPrice) as AvgUnitPrice
from Products
group by ProductID, UnitPrice
100 %
Results
Messages
ProductID AvgUnitPrice
1 19 29.99
2 20 50.00
3 22 24.99


Home
Reservation
HINGLETT
_AUCI_AIST3410_H05_L > Reservation 17293 > Working with SQL Server 2017
Time Remaining
2 hrs. 01 min.
Status
Win2K
SQLQuery9.sql - AIST3410.B-Flex (AIST3410\Administrator (52))* - Microsoft SQL Server Management Studio (Administrator)
Quick Launch (Ctrl+Q)
File Edit View Query Project Tools Window Help
New Query
Execute
B-Flex
Object Explorer
AIST3410 (SQL Server 14.0.1000.169 - AIST34
Databases
Security
Server Objects
Replication
PolyBase
Always On High Availability
Management
Integration Services Catalogs
SQL Server Agent (Agent XPs disabled)
XEvent Profiler
SQLQuery9.sql - AIS...Administrator (52))*
--9
select CustomerID, ContactName
from Customers
where CustomerID >= 70000
100 %
Results
Messages
CustomerID ContactName
1 82014 Francis Paul
2 93857 Mona Shelton
3 99273 Roxanne Thompson
4 71136 Glenn Santos
5 88822 Suzanne Brock
6 98980 Jordan Ruiz
7 74320 Matthew Willamson
8 98325 Rasalie Bailey
9 82669 Cheryl McKenzie
Activate Windows


Home
Reservation
HINGLETT
009_AUCI_AIST3410_H05_L > Reservation 17293 > Working with SQL Server 2017
Time Remaining
1 hrs. 58 min.
Content
Status
Win2K
SQLQuery10.sql - AIST3410.B-Flex (AIST3410\Administrator (52))* - Microsoft SQL Server Management Studio (Administrator)
Quick Launch (Ctrl+Q)
File Edit View Query Project Tools Window Help
New Query
Execute
B-Flex
Object Explorer
AIST3410 (SQL Server 14.0.1000.169 - AIST34
Databases
Security
Server Objects
Replication
PolyBase
Always On High Availability
Management
Integration Services Catalogs
SQL Server Agent (Agent XPs disabled)
XEvent Profiler
SQLQuery10.sql - AI...Administrator (52))*
--10
create view [Sample Customers] as
select CustomerID, ContactName, ContactPhone
from Customers
where ContactName Like 'M%'
select *...
100 %
Results
Messages
CustomerID ContactName ContactPhone
1 93857 Mona Shelton (998)964-3779
2 74320 Matthew Willamson (583)262-5549
3 40168 Maryann Owen (565)963-6756


Home
Reservation
HINGLETT
AUCI_AIST3410_H05_L > Reservation 17293 > Working with SQL Server 2017
Time Remaining
1 hrs. 56 min.
Status
Win2K
SQLQuery11.sql - AIST3410.B-Flex (AIST3410\Administrator (52)) - Microsoft SQL Server Management Studio (Administrator)
--11
select Sum(UnitPrice) as SumUnitPrice
from Products
Results
Messages
SumUnitPrice
104.98


Home
Reservation
HINGLETT
9_AUCI_AIST3410_H05_L > Reservation 17293 > Working with SQL Server 2017
Time Remaining
1 hrs. 55 min.
Status
Win2K
SQLQuery12.sql - AIST3410.B-Flex (AIST3410\Administrator (52)) - Microsoft SQL Server Management Studio (Administrator)
--12
select *
from OrderDetails
where UnitPrice <> 543.65
Results
Messages
OrderID ProductID UnitPrice Quanity Discount
457 21 799.99 400 10
786 20 876.00 1250 12