IE7425-Project Problem Solution

BY

Jyothirmai Nirdala

Seyedeh Shaghayegh Rabbanian

Venkata Mounika Chithirala

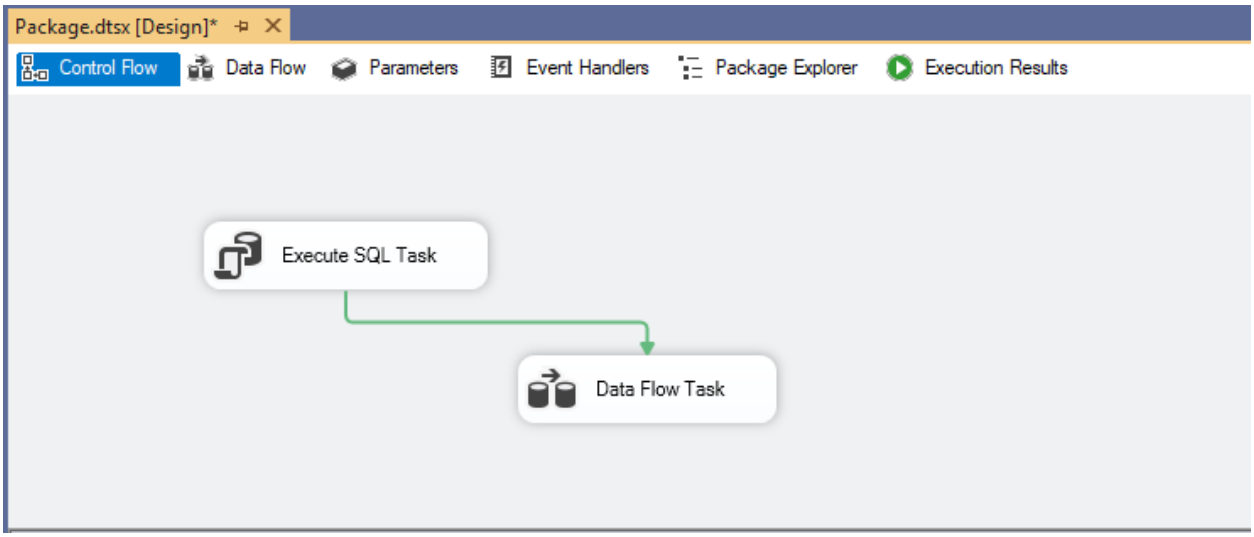
First of all create a database in Management studio and create a table which contains the following attributes:

```
CREATE DATABASE IE7425ProjectDataBase
use IE7425ProjectDataBase
GO

IF EXISTS (SELECT * FROM INFORMATION_SCHEMA.TABLES WHERE TABLE_NAME='CrimeData')
DROP TABLE CrimeData
GO


CREATE TABLE CrimeData(IncidentID varchar(20) Primary key ,
CrimeDate date NULL,
CrimeCategory varchar(50),
Crimename varchar(250),
City varchar(250),
Zipcode varchar(10),
Place varchar(250),
Street varchar(250),
latitude decimal(12,10),
longitude decimal(12,10),
DistrictName varchar(100)
)
```

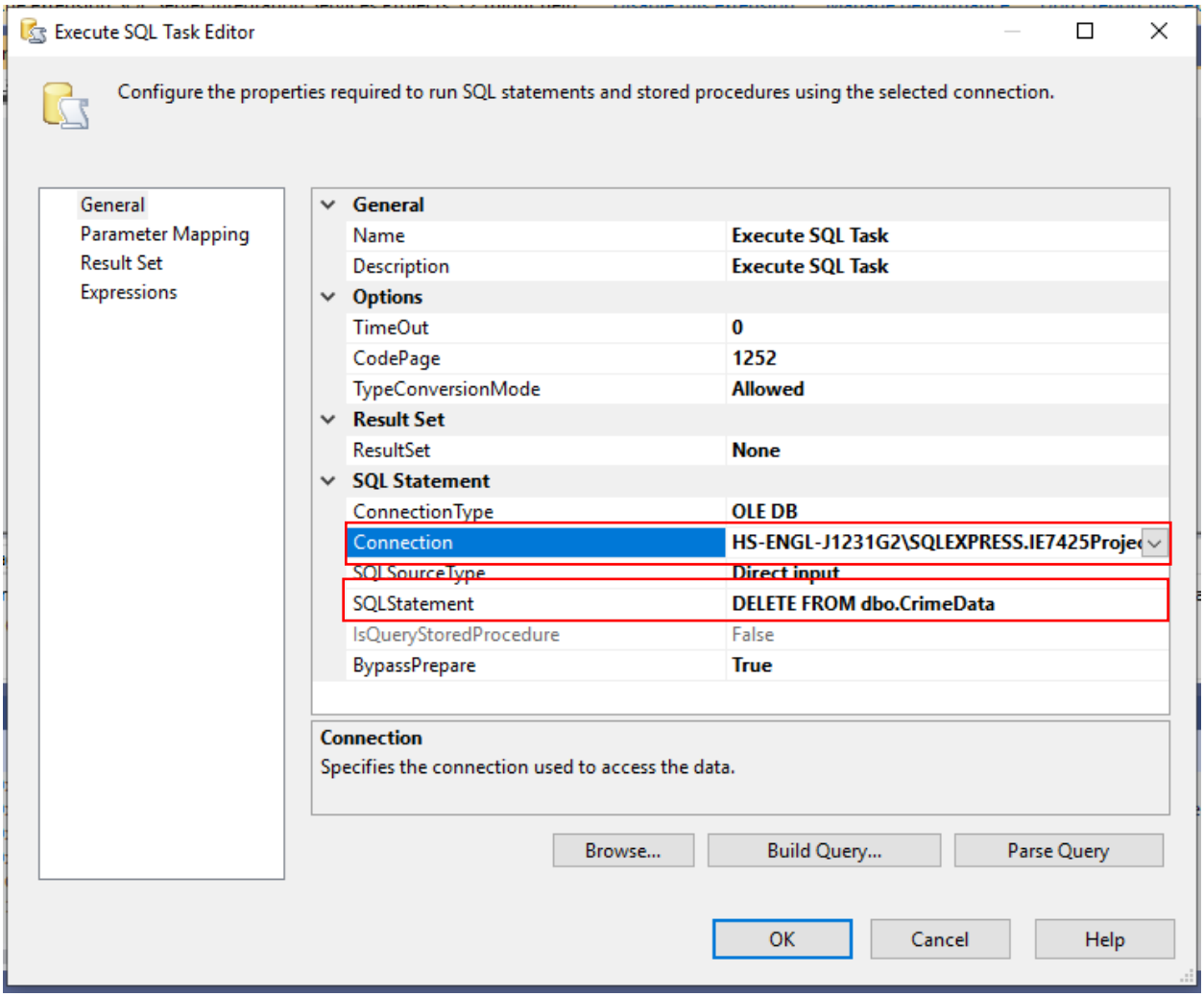
Visual Studio:

Open Visual studio and create a new “Integration Services” project.

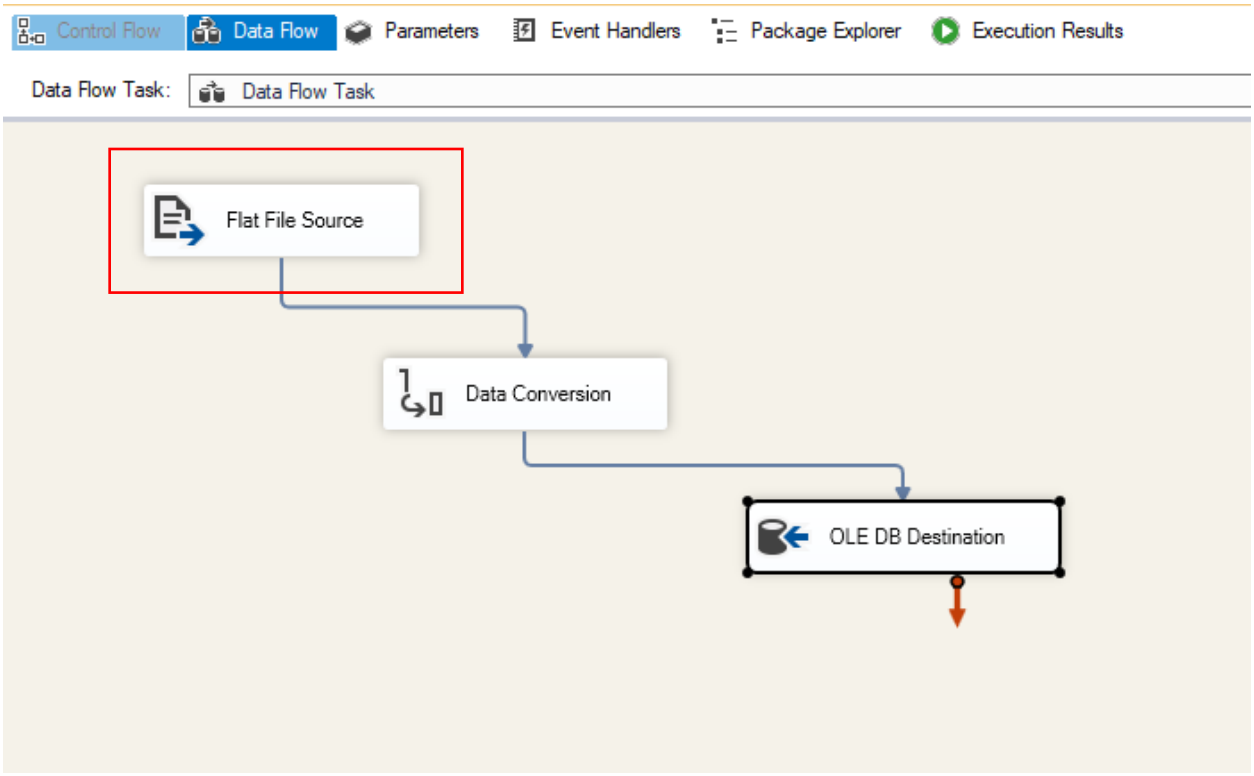
In control flow task add Execute SQL Task and a Data Flow Task and connect them:



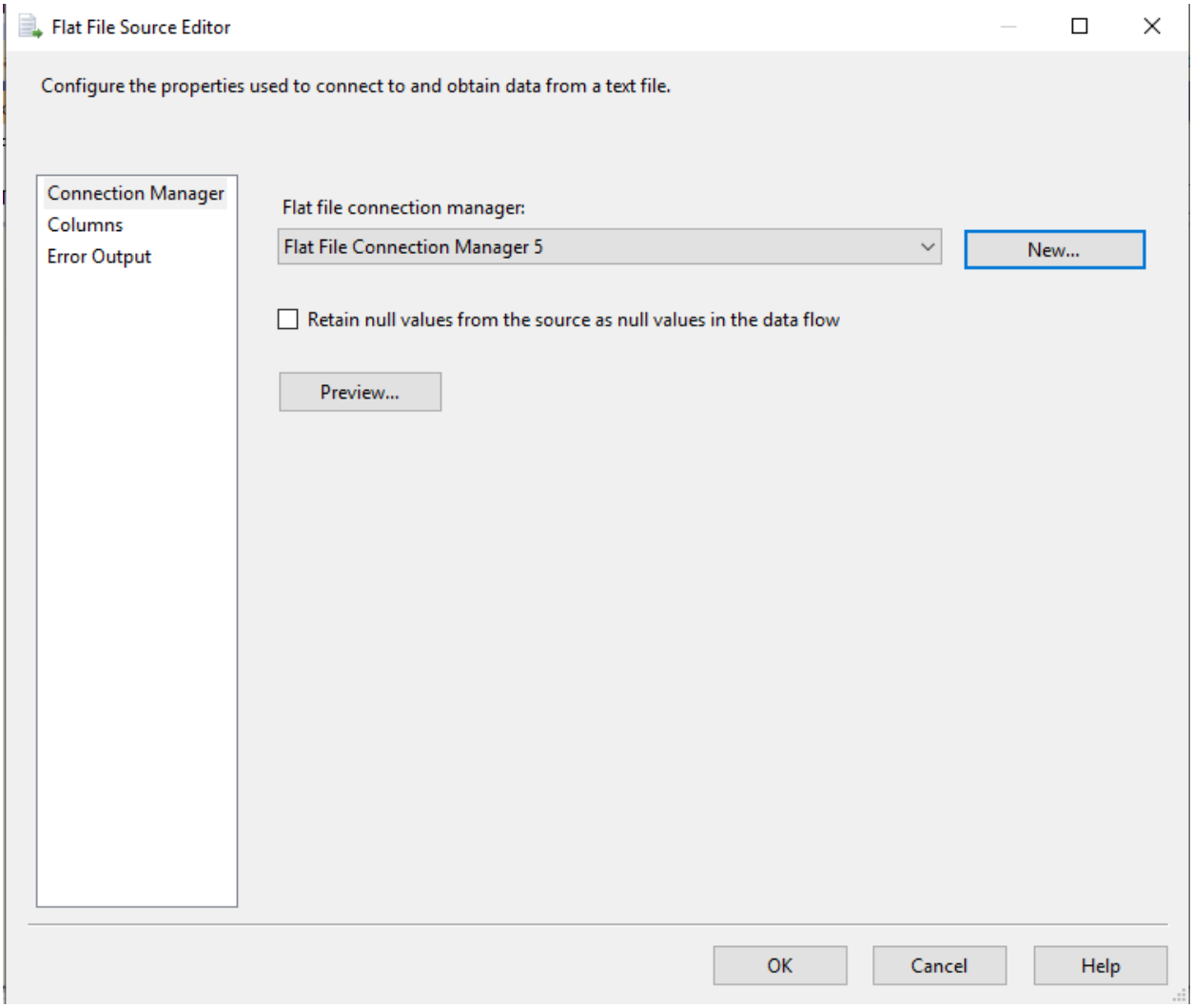
Open Execute SQL task and make a connection to your database by using connection and then write a SQL Statement which is: DELETE FROM dbo.CrimeData

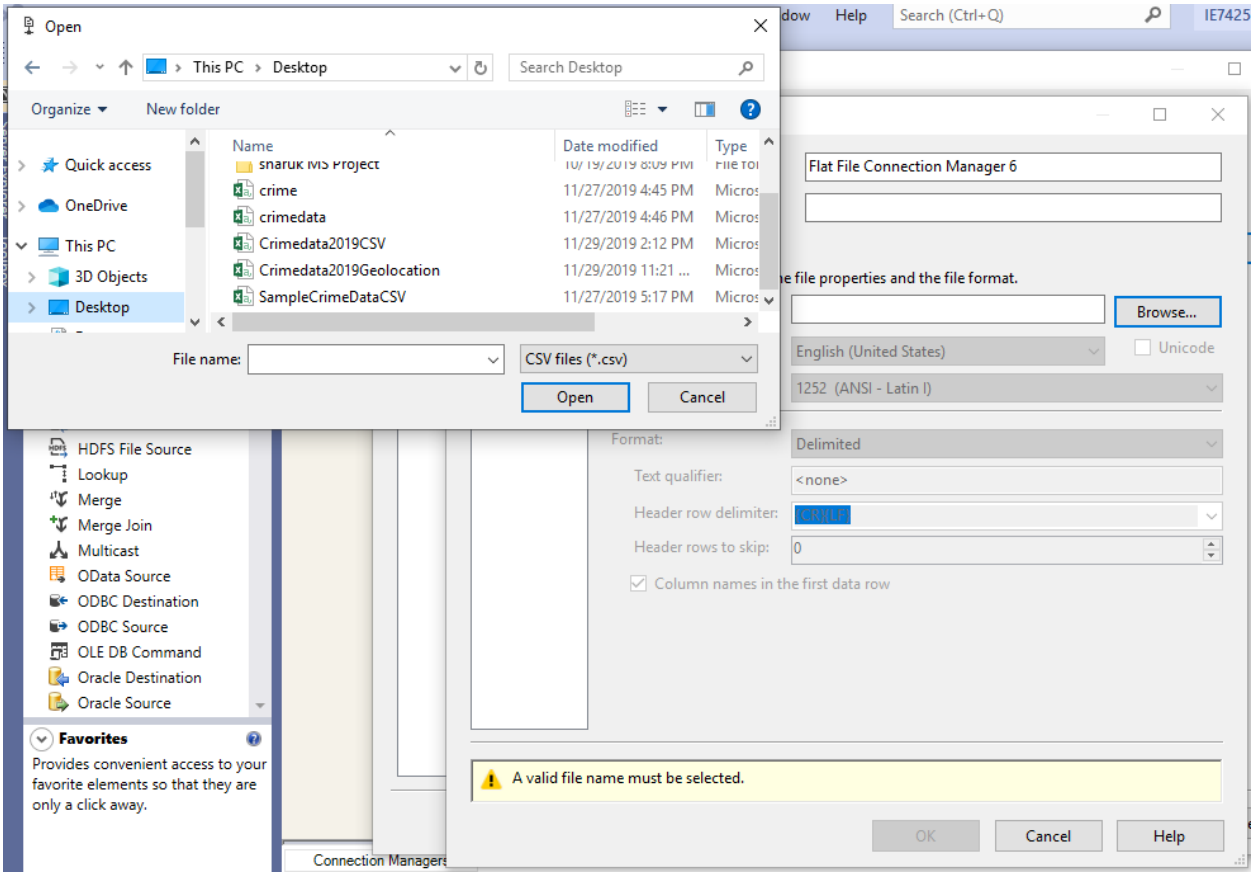


Then double click on your “Data Flow Task” and add a “Flat File Source”:

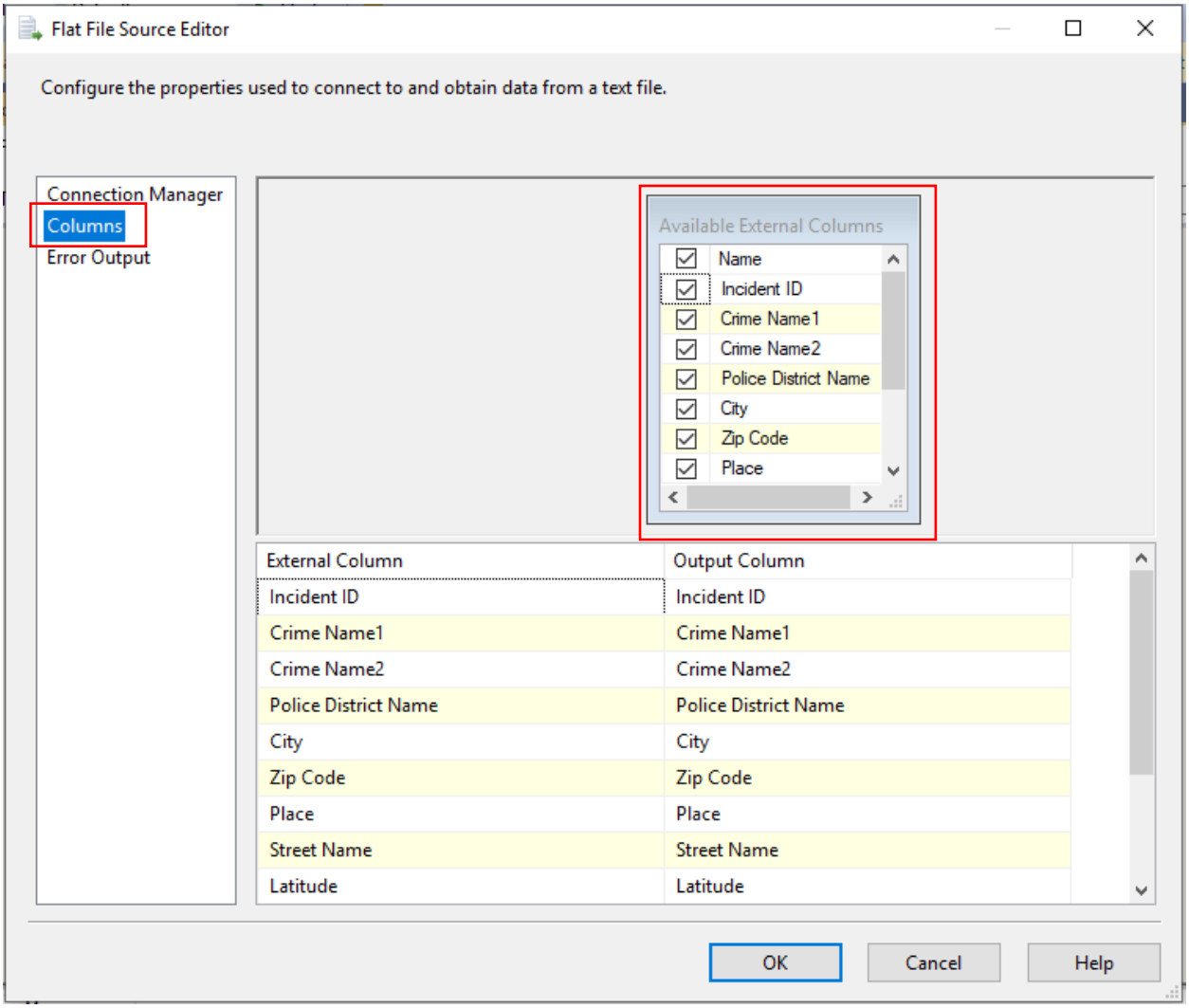

Control Flow
Data Flow
Parameters
Event Handlers
Package Explorer
Execution Results
Data Flow Task:
Data Flow Task
Flat File Source
Data Conversion
OLE DB Destination

Click on “New” and choose “Crimedata2019CSV” file:



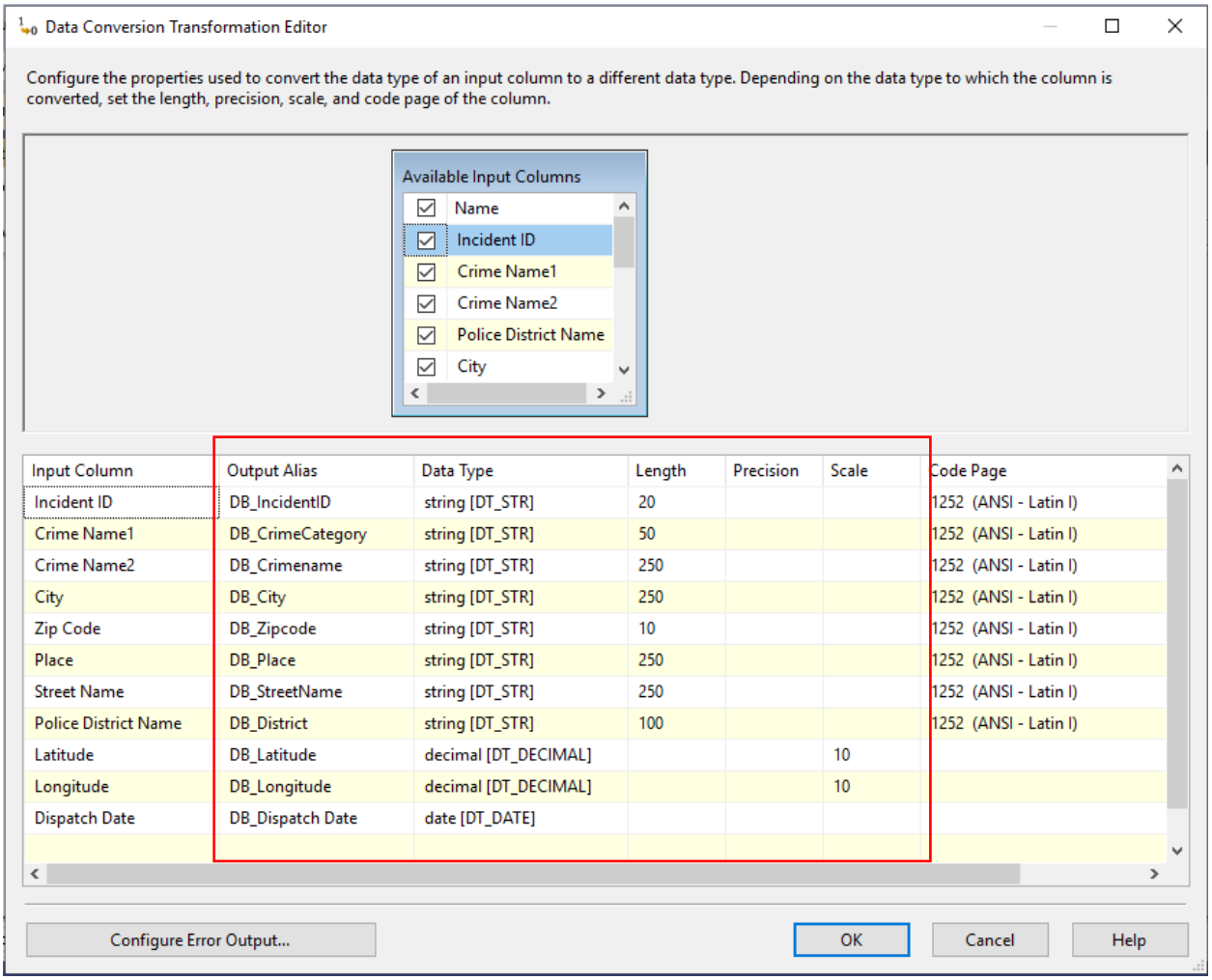

Open
This PC › Desktop
Search Desktop
Organize
New folder
Quick access
OneDrive
This PC
3D Objects
Desktop
Name
Date modified
Type
crime
11/27/2019 4:45 PM
crimedata
11/27/2019 4:46 PM
Crimedata2019CSV
11/29/2019 2:12 PM
Crimedata2019Geolocation
11/29/2019 11:21 ...
SampleCrimeDataCSV
11/27/2019 5:17 PM
File name:
CSV files (*.csv)
Open
Cancel
HDFS File Source
Lookup
Merge
Merge Join
Multicast
OData Source
ODBC Destination
ODBC Source
OLE DB Command
Oracle Destination
Oracle Source
Favorites
Provides convenient access to your favorite elements so that they are only a click away.
Connection Managers
Flat File Connection Manager 6
e file properties and the file format.
Browse...
English (United States)
Unicode
1252 (ANSI - Latin I)
Format:
Delimited
Text qualifier:
<none>
Header row delimiter:
Header rows to skip:
0
Column names in the first data row
A valid file name must be selected.
OK
Cancel
Help

Go to “Columns” and check all the columns from the CSV file and then click on OK:



Data Conversion:

Add a “Data Conversion” from the toolbox, then specify “Output Alias”,“DataType”,”Length”, “Precision” and “Scale” as shown below:

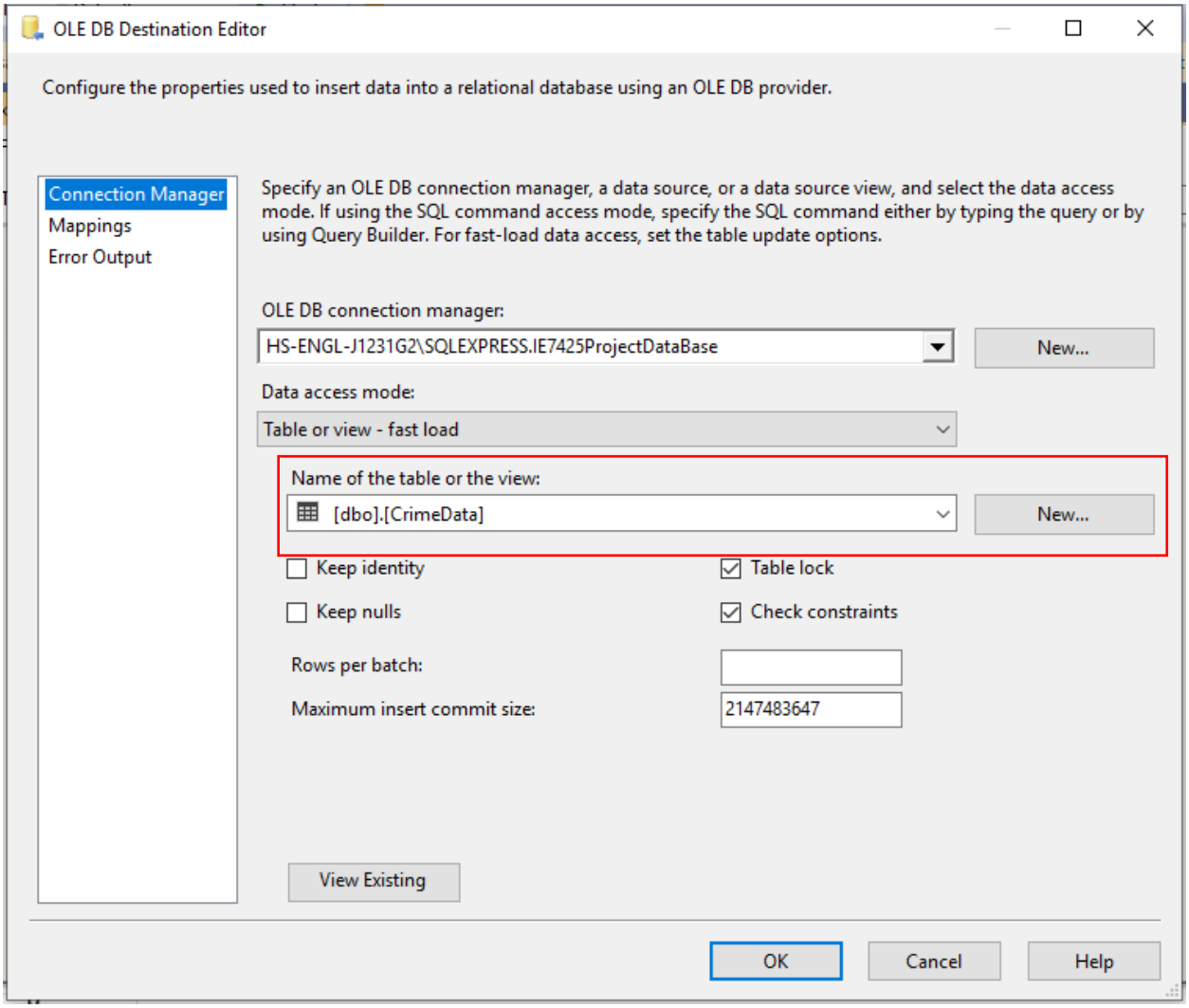


OLEDB Destination:

Add a “OLE DB Destination” from the toolbox

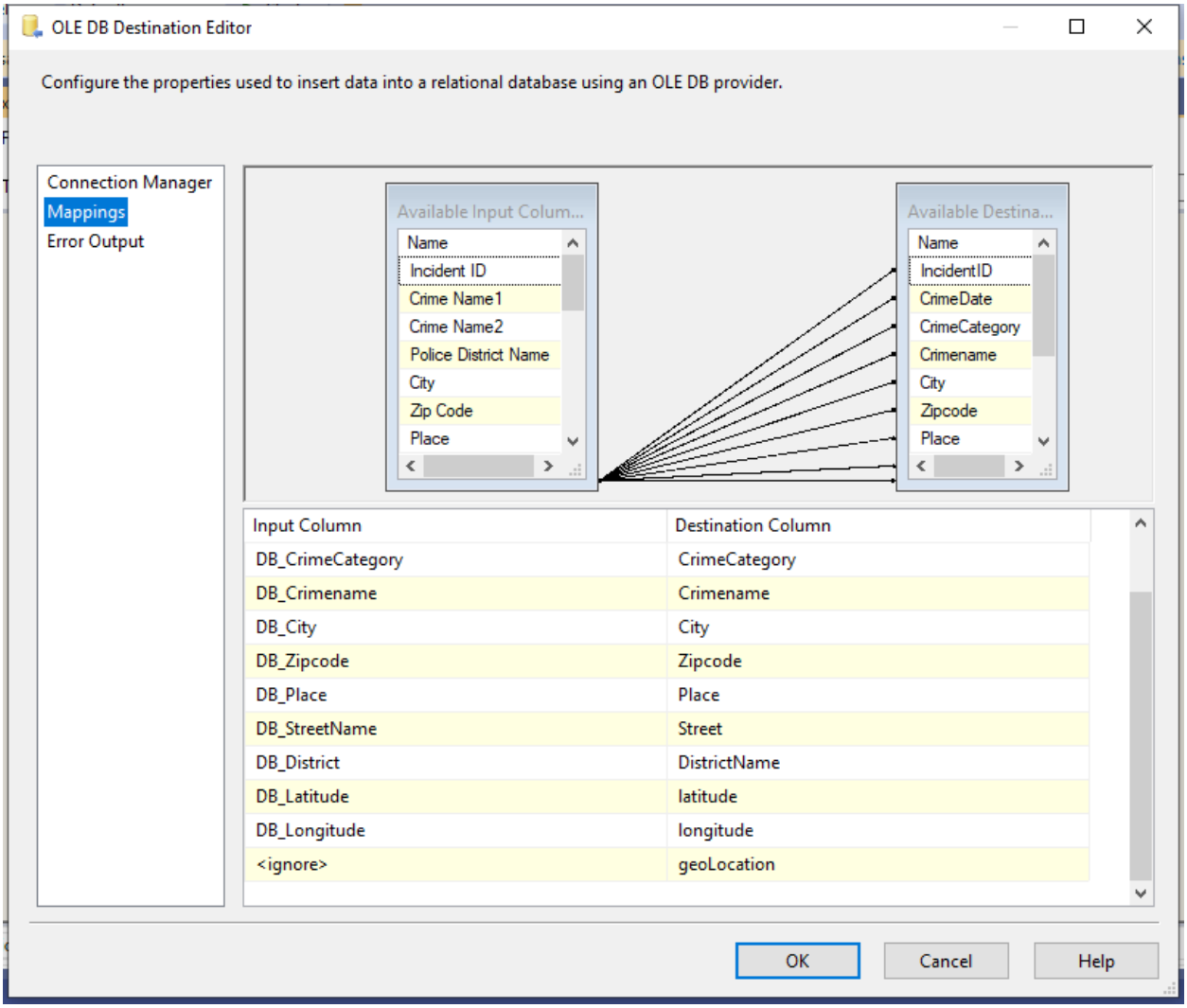
Connection manager:

In “Connection Manager”, specify your destination table which is “CrimeData”:



Mappings:

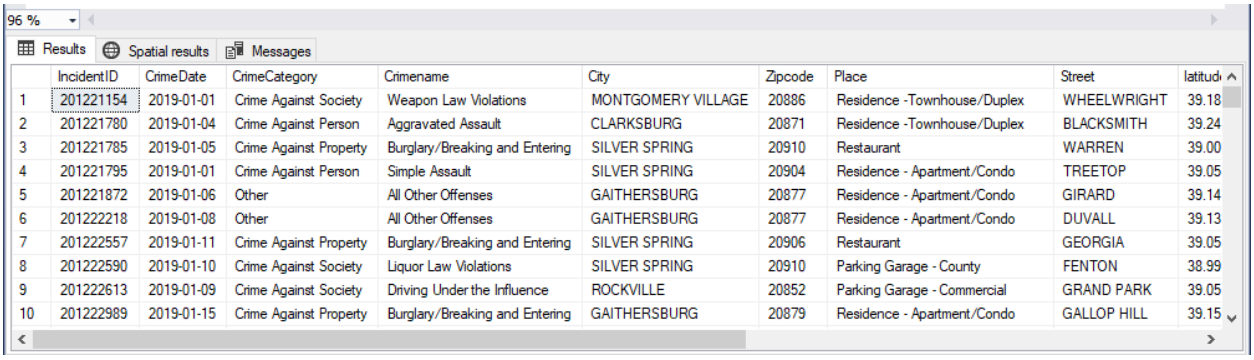
In Mappings, map all the input columns to the destination columns in Management Studio:



Click on Run button and then go to Management Studio:

By using the following query, you must be able to see the following data:

Select * from CrimeData



96 %

Results | Spatial results | Messages

	IncidentID	CrimeDate	CrimeCategory	Crimename	City	Zipcode	Place	Street	latitud
1	201221154	2019-01-01	Crime Against Society	Weapon Law Violations	MONTGOMERY VILLAGE	20886	Residence -Townhouse/Duplex	WHEELWRIGHT	39.18
2	201221780	2019-01-04	Crime Against Person	Aggravated Assault	CLARKSBURG	20871	Residence -Townhouse/Duplex	BLACKSMITH	39.24
3	201221785	2019-01-05	Crime Against Property	Burglary/Breaking and Entering	SILVER SPRING	20910	Restaurant	WARREN	39.00
4	201221795	2019-01-01	Crime Against Person	Simple Assault	SILVER SPRING	20904	Residence - Apartment/Condo	TREETOP	39.05
5	201221872	2019-01-06	Other	All Other Offenses	GAITHERSBURG	20877	Residence - Apartment/Condo	GIRARD	39.14
6	201222218	2019-01-08	Other	All Other Offenses	GAITHERSBURG	20877	Residence - Apartment/Condo	DUVALL	39.13
7	201222557	2019-01-11	Crime Against Property	Burglary/Breaking and Entering	SILVER SPRING	20906	Restaurant	GEORGIA	39.05
8	201222590	2019-01-10	Crime Against Society	Liquor Law Violations	SILVER SPRING	20910	Parking Garage - County	FENTON	38.99
9	201222613	2019-01-09	Crime Against Society	Driving Under the Influence	ROCKVILLE	20852	Parking Garage - Commercial	GRAND PARK	39.05
10	201222989	2019-01-15	Crime Against Property	Burglary/Breaking and Entering	GAITHERSBURG	20879	Residence - Apartment/Condo	GALLOP HILL	39.15

Add GeoLocation column by using Alter function:

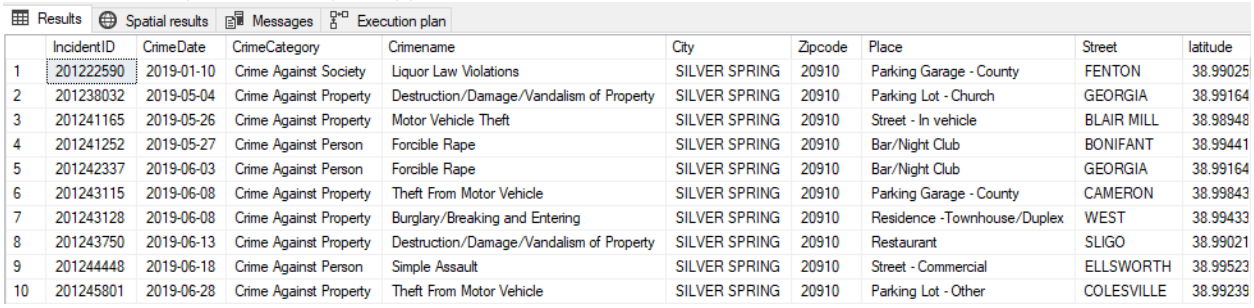
Since we want to use GeoLocation as a Geography data type, we need to add another column by using Longitude and Latitude columns that we previously added them by using ETL. Use the below query for having Geolocation data:

```
ALTER TABLE CrimeData
ADD geoLocation AS geography::Point(latitude,longitude,4326);
```

1- Find all crimes that happened within 1000 meters of Downtown Silver springs:

Create a buffer for a point(Silver Spring downtown) by using STBuffer and find the points within that buffer by using STIntersects:

```
select * from CrimeData where geoLocation.STIntersects(geography::Point(38.9955, -
77.0305, 4326).STBuffer(1000)) =1
```



Results | Spatial results | Messages | Execution plan

	IncidentID	CrimeDate	CrimeCategory	Crimename	City	Zipcode	Place	Street	latitude
1	201222590	2019-01-10	Crime Against Society	Liquor Law Violations	SILVER SPRING	20910	Parking Garage - County	FENTON	38.99025
2	201238032	2019-05-04	Crime Against Property	Destruction/Damage/Vandalism of Property	SILVER SPRING	20910	Parking Lot - Church	GEORGIA	38.99164
3	201241165	2019-05-26	Crime Against Property	Motor Vehicle Theft	SILVER SPRING	20910	Street - In vehicle	BLAIR MILL	38.98948
4	201241252	2019-05-27	Crime Against Person	Forcible Rape	SILVER SPRING	20910	Bar/Night Club	BONIFANT	38.99441
5	201242337	2019-06-03	Crime Against Person	Forcible Rape	SILVER SPRING	20910	Bar/Night Club	GEORGIA	38.99164
6	201243115	2019-06-08	Crime Against Property	Theft From Motor Vehicle	SILVER SPRING	20910	Parking Garage - County	CAMERON	38.99843
7	201243128	2019-06-08	Crime Against Property	Burglary/Breaking and Entering	SILVER SPRING	20910	Residence -Townhouse/Duplex	WEST	38.99433
8	201243750	2019-06-13	Crime Against Property	Destruction/Damage/Vandalism of Property	SILVER SPRING	20910	Restaurant	SLIGO	38.99021
9	201244448	2019-06-18	Crime Against Person	Simple Assault	SILVER SPRING	20910	Street - Commercial	ELLSWORTH	38.99523
10	201245801	2019-06-28	Crime Against Property	Theft From Motor Vehicle	SILVER SPRING	20910	Parking Lot - Other	COLESVILLE	38.99239

2- Find most frequent crime that happened within 1000 meters of Downtown Silver springs:

```
Select Top 1 Crimename AS [Most Frequent Crime],Count(CrimeData.IncidentID)AS [Number of Cases] from CrimeData where Crimename!='All Other Offenses'AND geoLocation.STIntersects(geography::Point(38.9955,-77.0305, 4326).STBuffer(1000))=1
Group by Crimename order by Count(CrimeData.IncidentID) DESC
```

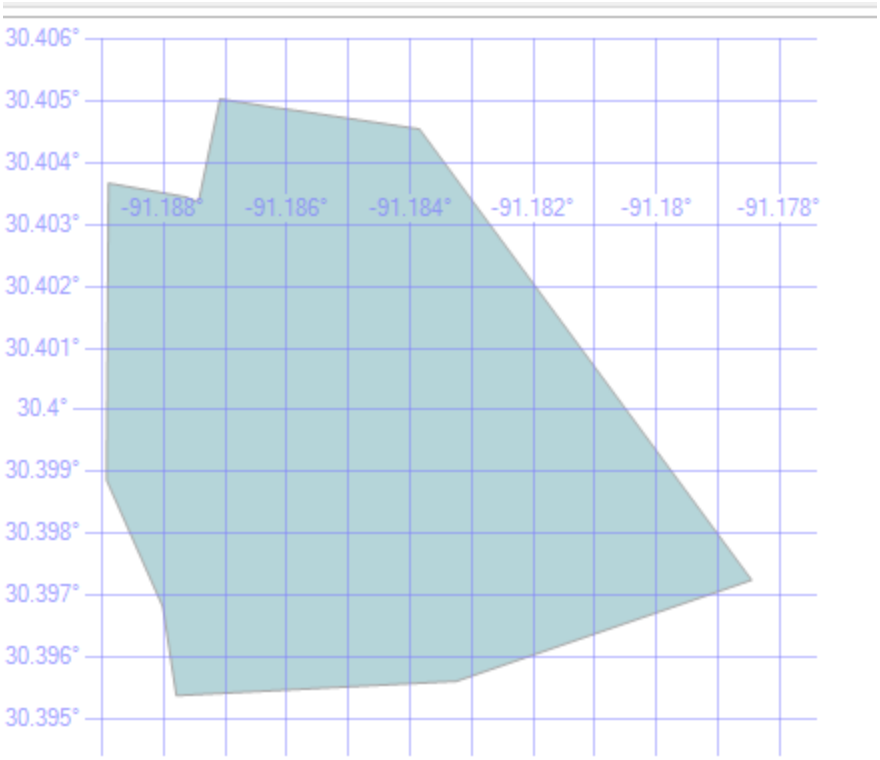
Results | Messages | Execution plan

	Most Frequent Crime	Number of Cases
1	Theft From Motor Vehicle	47

LSU Golf course:

LSU GOLF COURT

```
SELECT Geography::STPolyFromText('POLYGON((-91.178451 30.397243, -91.183844 30.404556, -91.185807 30.404849, -91.186258 30.404912, -91.187084 30.405044,
-91.187423 30.403418, -91.187485 30.40339, -91.187632 30.403453, -91.188894 30.403677, -91.188923 30.398865, -91.188010 30.396811, -91.187792 30.395371, -91.183243 30.395604, -91.178451 30.397243))', 4326);
```



AREA of Golf Course

```
DECLARE @GolfCourt geography;
SET @GolfCourt=Geography::STPolyFromText('POLYGON((-91.178451 30.397243, -91.183844
30.404556, -91.185807 30.404849, -91.186258 30.404912, -91.187084 30.405044,
-91.187423 30.403418, -91.187485 30.40339, -91.187632 30.403453, -91.188894 30.403677, -
91.188923 30.398865, -91.188010 30.396811, -91.187792 30.395371, -91.183243 30.395604, -
91.178451 30.397243))', 4326);
SELECT @GolfCourt.STArea()AS AREA_SQR_MTRS
```

```
DECLARE @GolfCourt geography;
SET @GolfCourt = Geography::STPolyFromText('POLYGON((-91.178451 30.397243, -91.183844
30.404556, -91.185807 30.404849, -91.186258 30.404912, -91.187084 30.405044,
-91.187423 30.403418, -91.187485 30.40339, -91.187632 30.403453, -91.188894 30.403677, -
91.188923 30.398865, -91.188010 30.396811, -91.187792 30.395371, -91.183243 30.395604, -
91.178451 30.397243))', 4157);

SELECT @GolfCourt.STArea () AS AREA_SQR_FEET
```

To check unit of measurement when SRID is 4326:

```
select unit_of_measure from sys.spatial_reference_systems
where authority_name = 'EPSG' AND authorized_spatial_reference_id = 4326
```

To check unit of measurement when SRID is 4157:

```
select unit_of_measure from sys.spatial_reference_systems
```

```
where authority_name = 'EPSG' AND authorized_spatial_reference_id = 4157
```