Intro to Database

Danny Tan

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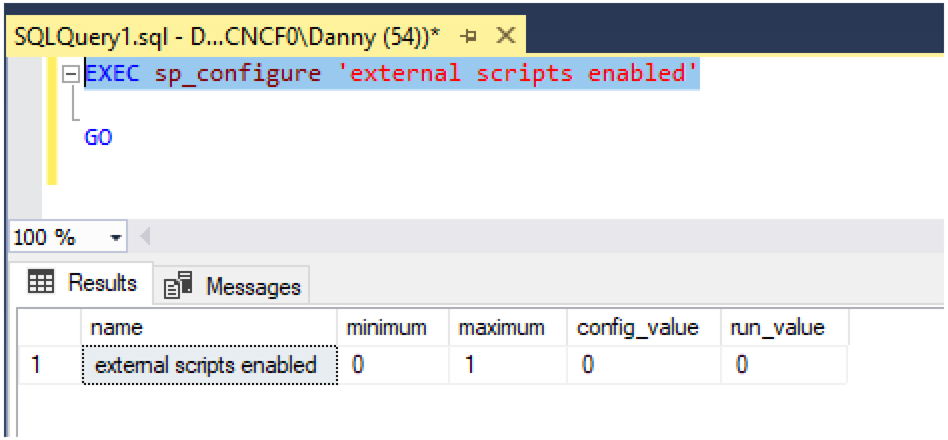
Python in-database Analytics

- Reduce data movement
- Easy Deployment
- Enterprise-grade equipment

Setup/Configuration

EXEC sp_configure 'external scripts enabled'

GO

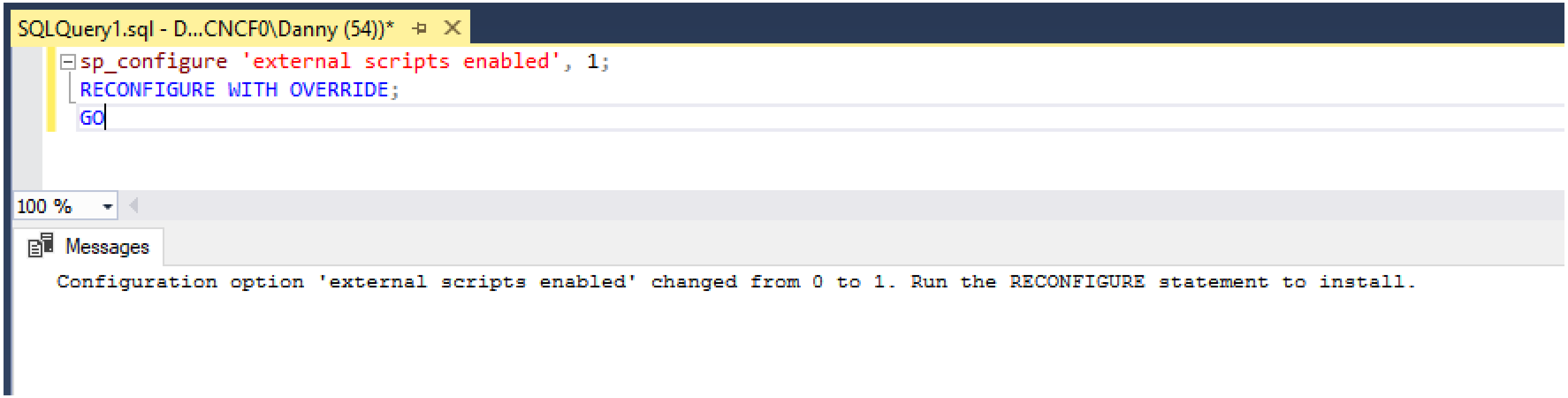


```
EXEC sp_configure 'external scripts enabled'

GO
```

	name	minimum	maximum	config_value	run_value
1	external scripts enabled	0	1	0	0

Setup/Configuration

```
sp_configure 'external scripts enabled', 1;
RECONFIGURE WITH OVERRIDE;
GO
```



```
sp_configure 'external scripts enabled', 1;
RECONFIGURE WITH OVERRIDE;
GO
```

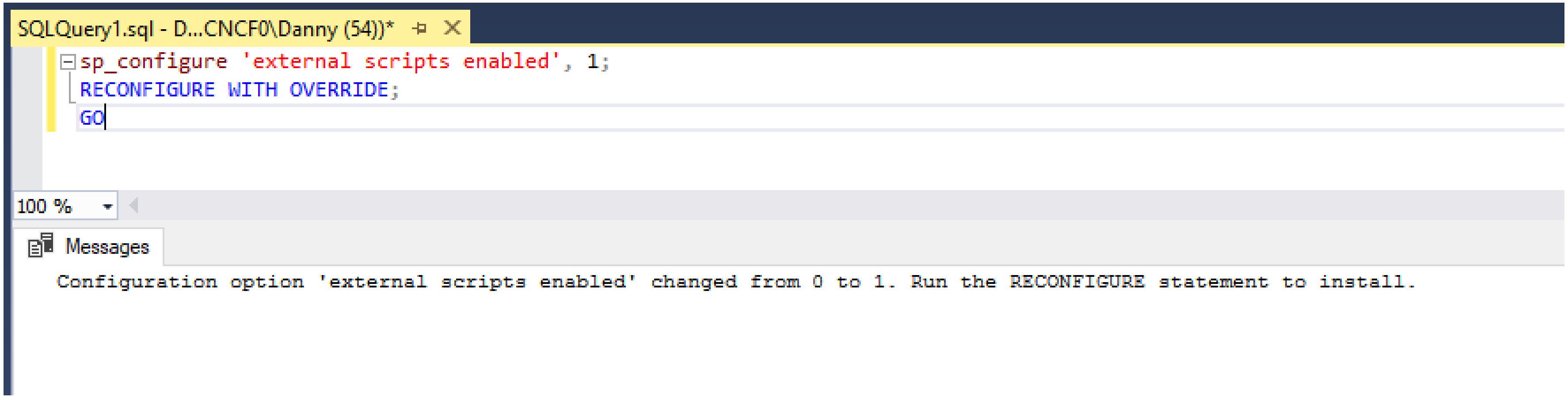
```
Configuration option 'external scripts enabled' changed from 0 to 1. Run the RECONFIGURE statement to install.
```

Setup/Configuration

sp_configure 'external scripts enabled', 1;

RECONFIGURE WITH OVERRIDE;

GO



```
sp_configure 'external scripts enabled', 1;
RECONFIGURE WITH OVERRIDE;
GO
```

```
Configuration option 'external scripts enabled' changed from 0 to 1. Run the RECONFIGURE statement to install.
```

Setup/Configuration

After executing this command, restart the SQL Server service in order to use this feature. Once this feature gets enabled, we can use this procedure to execute external scripts on the server.

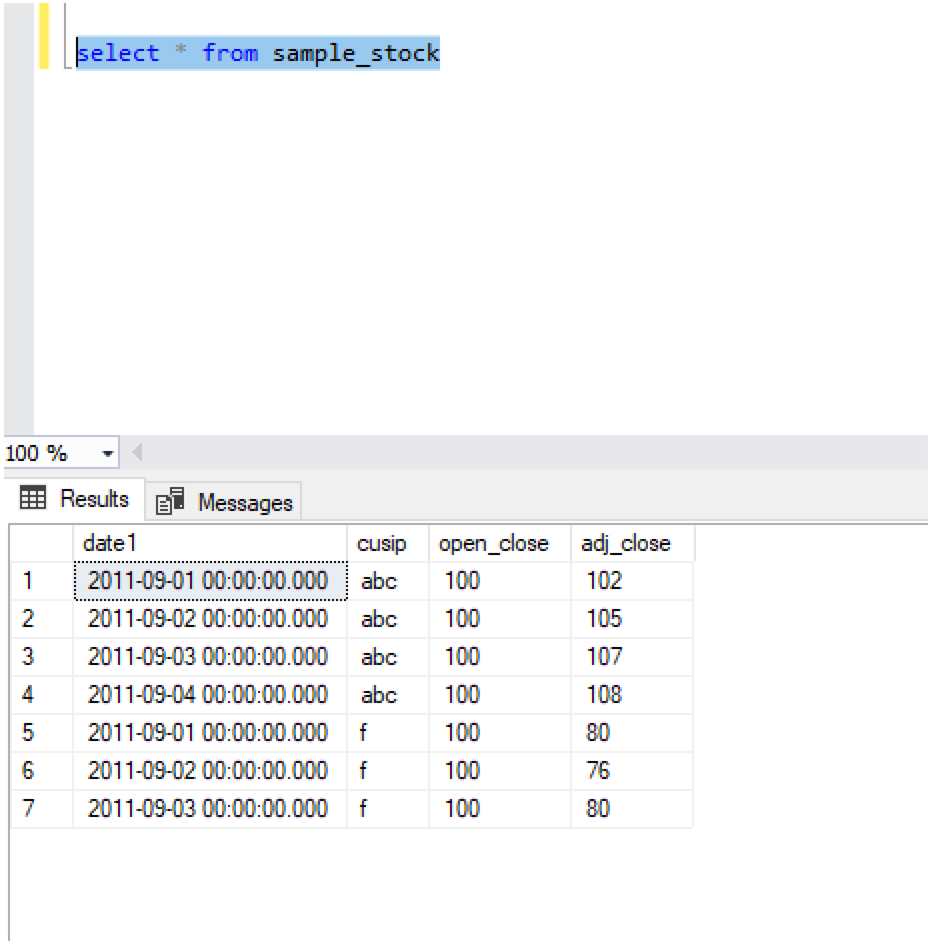
Python In-Database Format

```
sp_execute_external_script
    @language = N'language',
    @script = N'script'
    [ , @input_data_1 = N'input_data_1' ]
    [ , @input_data_1_name = N'input_data_1_name' ]
    [ , @output_data_1_name = N'output_data_1_name' ]
    [ , @parallel = 0 | 1 ]
    [ , @params = N'@parameter_name data_type [ OUT | OUTPUT ] [ ,...n ]' ]
    [ , @parameter1 = 'value1' [ OUT | OUTPUT ] [ ,...n ] ]
```

Examples

```
execute sp_execute_external_script
@language = N'Python',
@script = N'
l = [15, 10, 22, 36, 5, 4, 3, 2, 1]
print(sum(l) / float(len(l)))
'

execute sp_execute_external_script
@language = N'Python',
@script = N'
for i in range(5):
    if i<3 :
            print("i is now:", i*2)'
```

Sample Table



```
select * from sample_stock
```

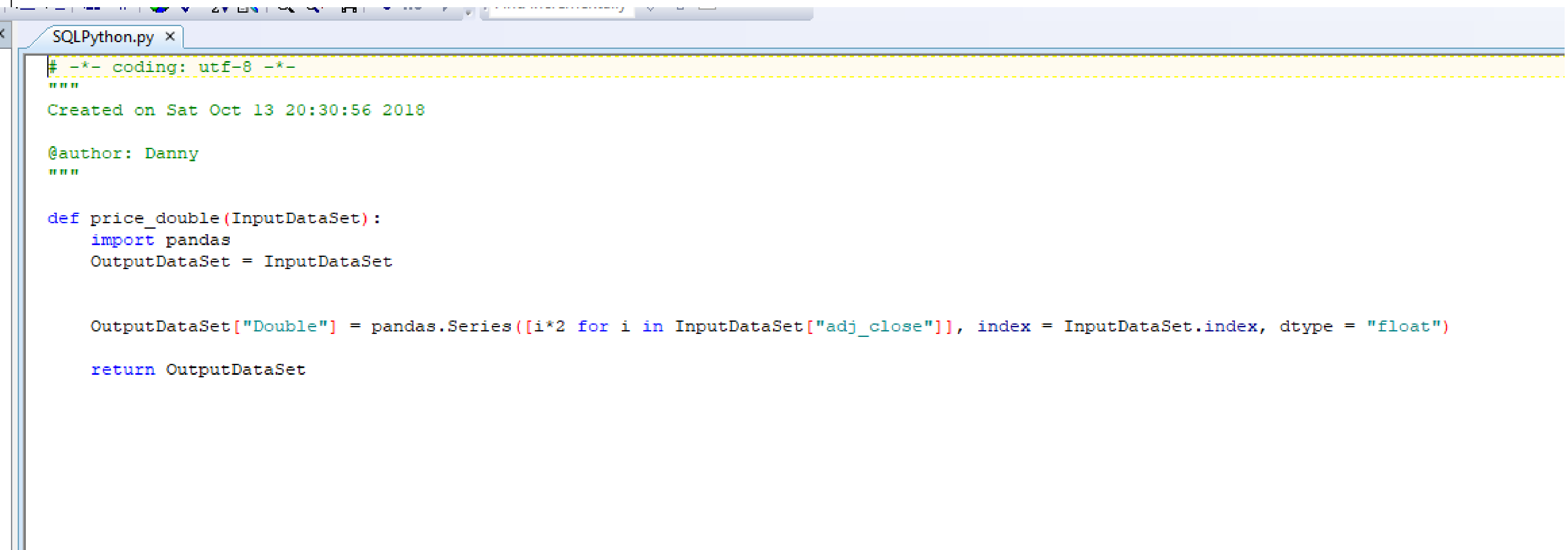
	date1	cusip	open_close	adj_close
1	2011-09-01 00:00:00.000	abc	100	102
2	2011-09-02 00:00:00.000	abc	100	105
3	2011-09-03 00:00:00.000	abc	100	107
4	2011-09-04 00:00:00.000	abc	100	108
5	2011-09-01 00:00:00.000	f	100	80
6	2011-09-02 00:00:00.000	f	100	76
7	2011-09-03 00:00:00.000	f	100	80

Sample Python Code

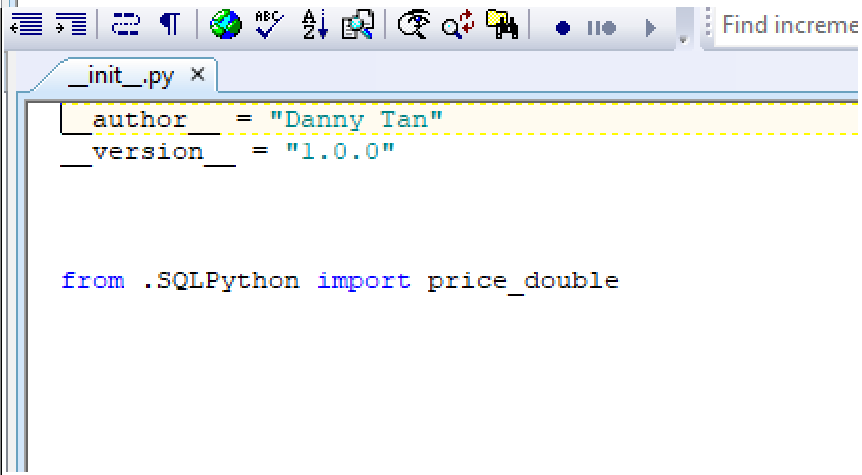
```
EXEC sp_execute_external_script
@language = N'Python',
@script = N'
OutputDataSet = InputDataSet

OutputDataSet["Double"] = pandas.Series([i*2 for i in InputDataSet["adj_close"]], index = InputDataSet.index, dtype = "float")
',
@input_data_1 = N'SELECT adj_close FROM sample_stock'
WITH RESULT SETS (("Input" nvarchar(10) null,"Double" nvarchar(10) null))
```

Use Python File

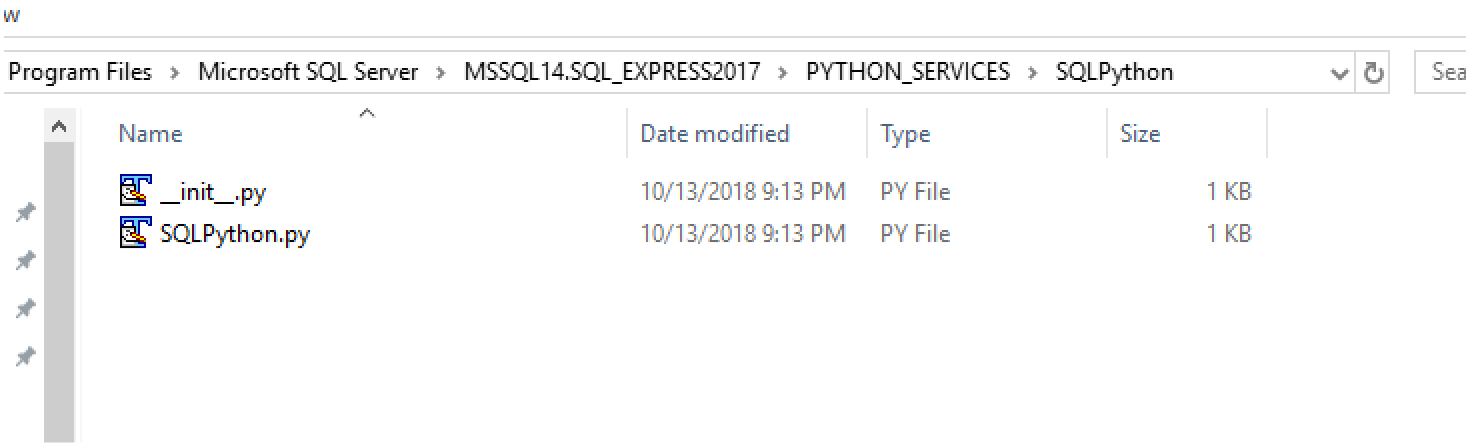
```
EXEC sp_execute_external_script
@language = N'Python',
@script = N'
from SQLPython import price_double
OutputDataSet = price_double(InputDataSet)
',
@input_data_1 = N'SELECT adj_close FROM sample_stock'
WITH RESULT SETS (("Input" nvarchar(10) null,"Double" nvarchar(10) null))
```



```
# -*- coding: utf-8 -*-
"""
Created on Sat Oct 13 20:30:56 2018

@author: Danny
"""

def price_double(InputDataSet):
    import pandas
    OutputDataSet = InputDataSet


    OutputDataSet["Double"] = pandas.Series([i*2 for i in InputDataSet["adj_close"]], index = InputDataSet.index, dtype = "float")

    return OutputDataSet
```

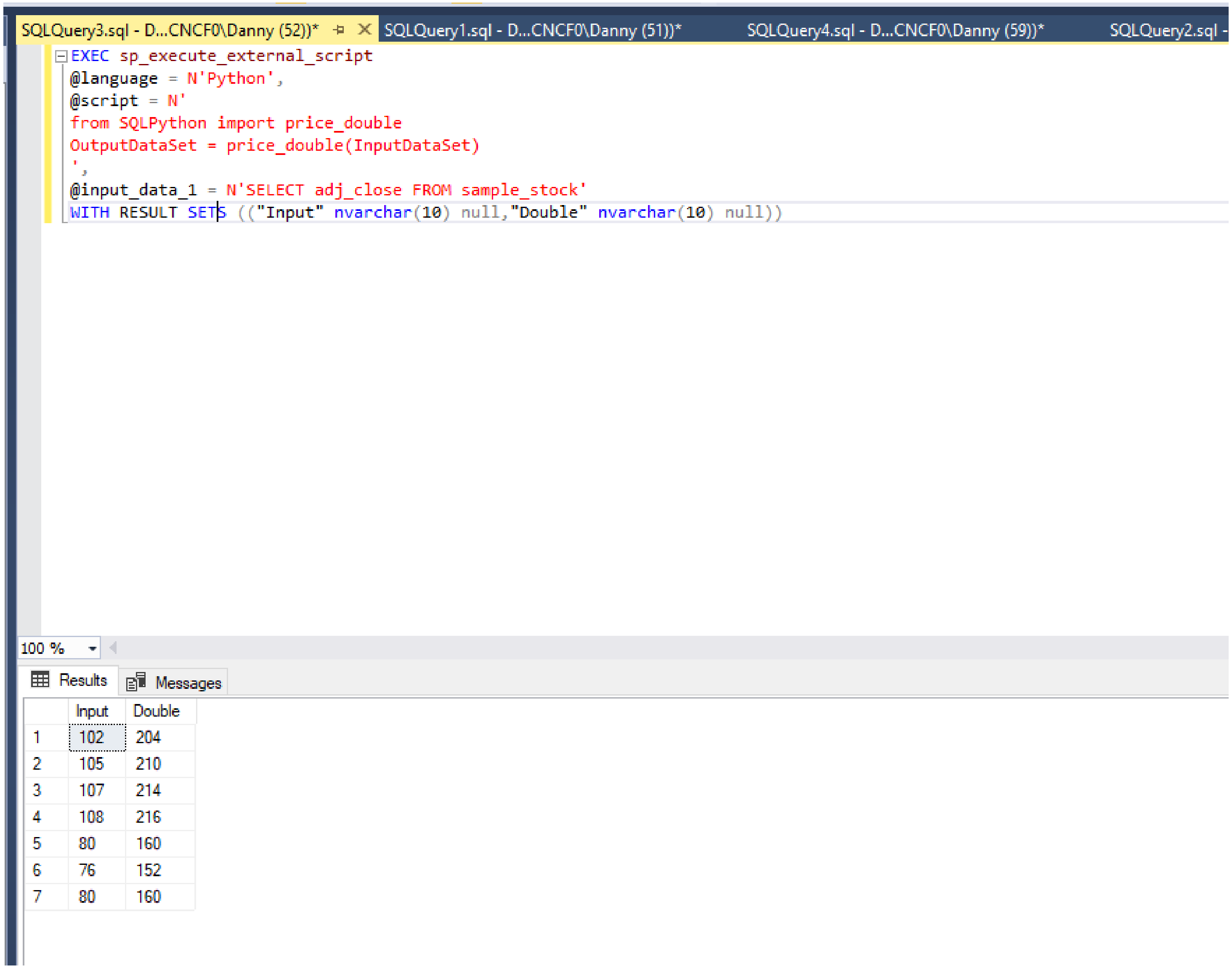


```
__author__ = "Danny Tan"
__version__ = "1.0.0"



from .SQLPython import price_double
```



Program Files › Microsoft SQL Server › MSSQL14.SQL_EXPRESS2017 › PYTHON_SERVICES › SQLPython

Name	Date modified	Type	Size
__init__.py	10/13/2018 9:13 PM	PY File	1 KB
SQLPython.py	10/13/2018 9:13 PM	PY File	1 KB


SQLQuery3.sql - D...CNCF0\Danny (52))*
SQLQuery1.sql - D...CNCF0\Danny (51))*
SQLQuery4.sql - D...CNCF0\Danny (59))*
SQLQuery2.sql -
100 %
Results
Messages

```
EXEC sp_execute_external_script
@language = N'Python',
@script = N'
from SQLPython import price_double
OutputDataSet = price_double(InputDataSet)
',
@input_data_1 = N'SELECT adj_close FROM sample_stock'
WITH RESULT SETS (("Input" nvarchar(10) null,"Double" nvarchar(10) null))
```

	Input	Double
1	102	204
2	105	210
3	107	214
4	108	216
5	80	160
6	76	152
7	80	160