(T18)討論 Pivot 和 Unpivot
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0. Summary

1.
Pivot Syntax1

Reference:
https://technet.microsoft.com/en-us/library/ms177410(v=sql.105).aspx

```
--SELECT  *
--FROM    --derived table
--       ( SELECT    T1C1 , --1st pivoted column
--                 T1C2 , --2nd pivoted column
--                 ....
--                 T1Cn-2 , --N-2 th pivoted column
--                 T1Cn-1 , --Column n-1 that contains the values that will become column headers
--                 T1Cn AS T1CnAliasName --Column n that used for aggregation function
--        FROM      T1
--      ) AS BaseData PIVOT
--      ( SUM(T1CnAliasName) FOR T1Cn-2 IN ( T1Cn-1V1, T1Cn-1V2, T1Cn-1V3 ) ) AS PivotTable;
--ORDER BY T1C1, T1C2, ... , T1Cn-2
--GO -- Run the previous command and begins new batch
```

T stand for Table
C stand for column
V stand for Value
T1C1, T1C2, ... , T1Cn-2 will become the pivoted columns in left hand side.
Column n-1,T1Cn-1, that contains the values that will become column headers.
Column n,T1Cn, that used for aggregation function.
Using "ORDER BY T1Cn-1V1, T1Cn-1V2, T1Cn-1V3, T1Cn" might cause some logic error that we don't expect.
Better just use "ORDER BY T1C1, T1C2, ... , T1Cn-2".

1.1.
E.g.

```
--SELECT  *
--FROM    --derived table
--       ( SELECT    AgentName ,    --1st pivoted column
--                 SoldSuburb ,    --Column n-1 that contains the values that will become column headers
--                 SoldPrice AS TotalSales    --Column n that used for aggregation function
--        FROM      HouseSoldRecord2
--       ) AS BaseData PIVOT
--       ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable;
--GO -- Run the previous command and begins new batch
```

AgentName will become the pivoted columns in left hand side.
Column SoldSuburb that contains the values that will become column headers, Suburb01, Suburb02, Suburb03.
Column SoldPrice that used for aggregation function.
Using "ORDER BY Suburb01, Suburb02, Suburb03, SoldPrice" might cause some logic error that we don't expect.
Better just use "ORDER BY AgentName".

2.
Pivot Syntax2
Reference:
https://technet.microsoft.com/en-us/library/ms177410(v=sql.105).aspx
If you don't want to display all pivoted columns in left hand side.
Then you cannot use "SELECT *",
you have to use "SELECT T1C1, T1C2, ..." in outter query.

```
--SELECT  T1C1, T1C2, ...T1Cn-3, T1Cn-1V1, T1Cn-1V2, T1Cn-1V3
---- You hide T1Cn-2 pivoted column, but You still can ORDER BY T1Cn-2.
--FROM    --derived table
--       ( SELECT    T1C1 , --1st pivoted column
--                 T1C2 , --2nd pivoted column
--                 ....
--                 T1Cn-3 , --N-3 th pivoted column
--                 T1Cn-2 , --N-2 th pivoted column which you don't want to display.
--                 T1Cn-1 , --Column n-1 that contains the values that will become column headers
--                 T1Cn AS T1CnAliasName --Column n that used for aggregation function
--        FROM      T1
--      ) AS BaseData PIVOT
--      ( SUM(T1CnAliasName) FOR T1Cn-2 IN ( T1Cn-1V1, T1Cn-1V2, T1Cn-1V3 ) ) AS PivotTable;
--ORDER BY T1C1, T1C2, ... , T1Cn-2
--GO -- Run the previous command and begins new batch
```

T stand for Table
C stand for column

V stand for Value
T1C1, T1C2, ... , T1Cn-3 will become the pivoted columns in left hand side.
You hide T1Cn-2 pivoted column, but You still can ORDER BY T1Cn-2.
Column n-1,T1Cn-1, that contains the values that will become column headers.
Column n,T1Cn, that used for aggregation function.
Using "ORDER BY T1Cn-1V1, T1Cn-1V2, T1Cn-1V3, T1Cn" might cause some logic error that we don't expect.
Better just use "ORDER BY T1C1, T1C2, ... , T1Cn-2".

2.1.
E.g.

```
--SELECT  AgentName, SoldYear, SoldMonthName, Suburb01, Suburb02, Suburb03
--FROM    --derived table
--        ( SELECT    AgentName ,
--                    YEAR(SoldDateTime) AS SoldYear ,
--                    DATEPART(MONTH, SoldDateTime) AS SoldMonth ,
--                      DATENAME(MM,SoldDateTime) AS SoldMonthName ,
--                    SoldSuburb ,
--                    SoldPrice AS TotalSales
--          FROM      HouseSoldRecord2
--        ) AS BaseData PIVOT
--        ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable
--ORDER BY AgentName , SoldYear, SoldMonth
--GO -- Run the previous command and begins new batch
```

2.1.1.
AgentName, SoldYear, SoldMonthName will become the pivoted columns in left hand side.
Column SoldSuburb that contains the values that will become column headers, Suburb01, Suburb02, Suburb03.
Column SoldPrice that used for aggregation function.
Using "ORDER BY Suburb01, Suburb02, Suburb03, SoldSuburb" might cause some logic error that we don't expect.
Better just use "AgentName, SoldYear, SoldMonth".
2.1.2.
If using "ORDER BY AgentName , SoldYear, SoldMonthName"
SoldMonthName will become the alphabet order.
E.g. "April", "December", "July", "June" ,"November" ...etc.
This is not what we want,
we want the order by SoldMonth number but display SoldMonthName
E.g. "April", ... , "June", "July",..., "November" ,"December"
Thus, inner derived table SELECT both SoldMonth and SoldMonthName.
But outer pivot table only SELECT SoldMonthName.
In addition, we still can ORDER BY SoldMonth.

3.
Pivot and UnPivot Syntax3
3.1.
If the PIVOT operator has not aggregated the data,
you can get your original data back using the UNPIVOT operator
but If the PIVOT operator has aggregated the data,
then you can NOT use UNPIVOT operator.
3.2.
3.2.1.
Create PIVOT Table View Syntax.

```
--IF ( EXISTS ( SELECT    *
--              FROM      INFORMATION_SCHEMA.TABLES
--              WHERE     TABLE_NAME = 'vwName' ) )
--    BEGIN
--        DROP VIEW vwName;
--    END;
--GO -- Run the previous command and begins new batch
--CREATE VIEW vwName
--AS
--    --SELECT PIVOT Table ...
--GO -- Run the previous command and begins new batch
----See the View data
--SELECT  *
--FROM    vwName;
--GO -- Run the previous command and begins new batch
```

```
-----------------------------------
3.2.2.
E.g.
----Delete View if exist
--IF ( EXISTS ( SELECT    *
--            FROM      INFORMATION_SCHEMA.TABLES
--            WHERE     TABLE_NAME = 'vwHouseSoldRecord5Pivot1' ) )
--    BEGIN
--        DROP VIEW vwHouseSoldRecord5Pivot1;
--    END;
--GO -- Run the previous command and begins new batch
----Create view for HouseSoldRecord5 Povit Table
--CREATE VIEW vwHouseSoldRecord5Pivot1
--AS
--    SELECT  AgentName ,
--            Suburb01 ,
--            Suburb02 ,
--            Suburb03
--    FROM    HouseSoldRecord5 PIVOT
--( SUM(SoldPrice) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable;
--GO -- Run the previous command and begins new batch
----See the View data
--SELECT  *
--FROM    vwHouseSoldRecord5Pivot1;
--GO -- Run the previous command and begins new batch
-----------------------------------
3.3.
3.3.1.
UnPivot from PIVOT Table View Syntax.
--SELECT C1, C2, C3
--FROM vwName
--UNPIVOT
--(
--      C3
--      FOR C2 IN (C2V1, C2V2 ,C2V3)
--) AS UnpivotExample
--ORDER BY C1, C2;
--GO -- Run the previous command and begins new batch
-----------------------------------
3.3.2.
E.g.
--SELECT AgentName, SoldSuburb, SoldPrice
--FROM vwHouseSoldRecord5Pivot1
--UNPIVOT
--(
--      SoldPrice
--      FOR SoldSuburb IN (Suburb01, Suburb02 ,Suburb03)
--) AS UnpivotExample
--ORDER BY AgentName, SoldSuburb;
--GO -- Run the previous command and begins new batch
```

==

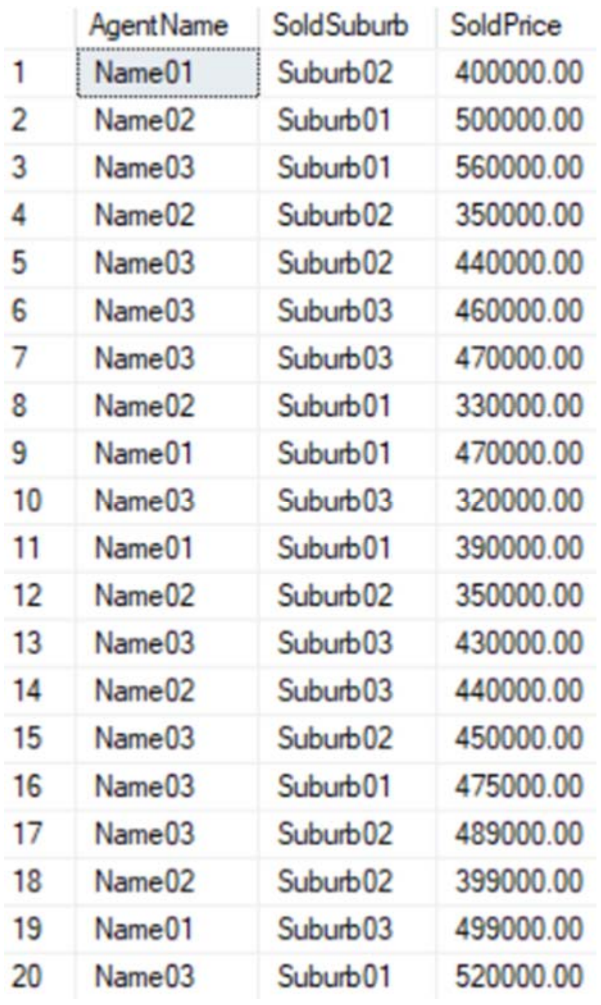
1. Pivot : HouseSoldRecord1 Table

```
--==================================================================
--T018_01_Pivot : HouseSoldRecord1 Table
--==================================================================
```

1.1. Create Sample Data

```sql
--==================================================================
--T018_01_01
--HouseSoldRecord1 Table
--Create Sample Data
IF ( EXISTS ( SELECT    *
              FROM      INFORMATION_SCHEMA.TABLES
              WHERE     TABLE_NAME = 'HouseSoldRecord1' ) )
    BEGIN
        TRUNCATE TABLE dbo.HouseSoldRecord1;
        DROP TABLE HouseSoldRecord1;
    END;
GO -- Run the previous command and begins new batch
CREATE TABLE HouseSoldRecord1
    (
      AgentName NVARCHAR(100) ,
      SoldSuburb NVARCHAR(100) ,
      SoldPrice MONEY
    );
GO -- Run the previous command and begins new batch
INSERT  HouseSoldRecord1
VALUES  ( N'Name01', N'Suburb02', 400000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name02', N'Suburb01', 500000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name03', N'Suburb01', 560000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name02', N'Suburb02', 350000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name03', N'Suburb02', 440000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name03', N'Suburb03', 460000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name03', N'Suburb03', 470000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name02', N'Suburb01', 330000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name01', N'Suburb01', 470000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name03', N'Suburb03', 320000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name01', N'Suburb01', 390000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name02', N'Suburb02', 350000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name03', N'Suburb03', 430000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name02', N'Suburb03', 440000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name03', N'Suburb02', 450000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name03', N'Suburb01', 475000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name03', N'Suburb02', 489000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name02', N'Suburb02', 399000 );
INSERT  HouseSoldRecord1
VALUES  ( N'Name01', N'Suburb03', 499000 );
INSERT  HouseSoldRecord1
```

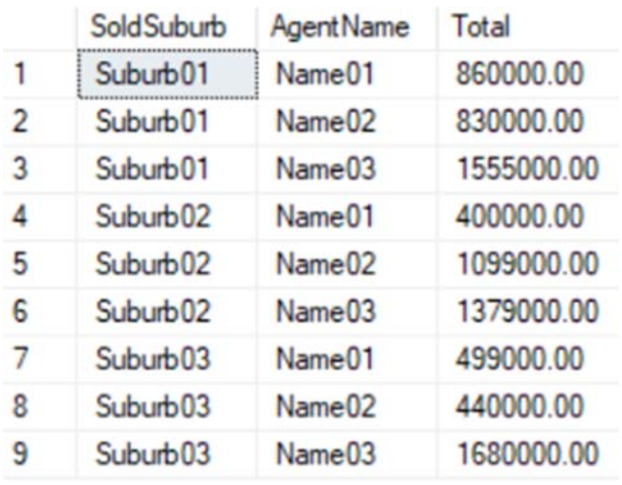
```
VALUES  ( N'Name03', N'Suburb01', 520000 );
GO -- Run the previous command and begins new batch
SELECT  *
FROM    HouseSoldRecord1;
GO -- Run the previous command and begins new batch
```



	AgentName	SoldSuburb	SoldPrice
1	Name01	Suburb02	400000.00
2	Name02	Suburb01	500000.00
3	Name03	Suburb01	560000.00
4	Name02	Suburb02	350000.00
5	Name03	Suburb02	440000.00
6	Name03	Suburb03	460000.00
7	Name03	Suburb03	470000.00
8	Name02	Suburb01	330000.00
9	Name01	Suburb01	470000.00
10	Name03	Suburb03	320000.00
11	Name01	Suburb01	390000.00
12	Name02	Suburb02	350000.00
13	Name03	Suburb03	430000.00
14	Name02	Suburb03	440000.00
15	Name03	Suburb02	450000.00
16	Name03	Suburb01	475000.00
17	Name03	Suburb02	489000.00
18	Name02	Suburb02	399000.00
19	Name01	Suburb03	499000.00
20	Name03	Suburb01	520000.00

1.2. GROUP BY

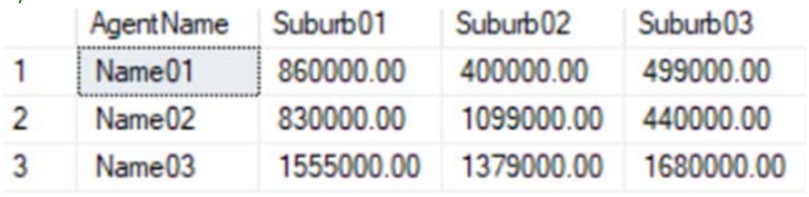
```
--==================================================================
--T018_01_02
--HouseSoldRecord1 Table
--GROUP BY
SELECT  SoldSuburb ,
        AgentName ,
        SUM(SoldPrice) AS Total
FROM    HouseSoldRecord1
GROUP BY SoldSuburb ,
        AgentName
ORDER BY SoldSuburb ,
        AgentName;
GO -- Run the previous command and begins new batch
```



	SoldSuburb	AgentName	Total
1	Suburb01	Name01	860000.00
2	Suburb01	Name02	830000.00
3	Suburb01	Name03	1555000.00
4	Suburb02	Name01	400000.00
5	Suburb02	Name02	1099000.00
6	Suburb02	Name03	1379000.00
7	Suburb03	Name01	499000.00
8	Suburb03	Name02	440000.00
9	Suburb03	Name03	1680000.00

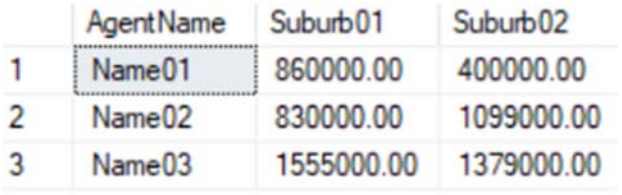
1.3. Pivot need derived table

```
--==================================================================
--T018_01_03
--HouseSoldRecord1 Table
--Pivot need derived table
SELECT  AgentName ,
        Suburb01 ,
        Suburb02 ,
        Suburb03
FROM    HouseSoldRecord1 PIVOT
( SUM(SoldPrice) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable;
/*
Output as the following
--AgentName Suburb01   Suburb02   Suburb03
--Name01    860000.00  400000.00  499000.00
--Name02    830000.00  1099000.00 440000.00
--Name03    1555000.00 1379000.00 1680000.00
*/
```



	AgentName	Suburb01	Suburb02	Suburb03
1	Name01	860000.00	400000.00	499000.00
2	Name02	830000.00	1099000.00	440000.00
3	Name03	1555000.00	1379000.00	1680000.00

```
SELECT  AgentName ,
        Suburb01 ,
        Suburb02
FROM    HouseSoldRecord1 PIVOT
( SUM(SoldPrice) FOR SoldSuburb IN ( Suburb01, Suburb02 ) ) AS PivotTable;
```



	AgentName	Suburb01	Suburb02
1	Name01	860000.00	400000.00
2	Name02	830000.00	1099000.00
3	Name03	1555000.00	1379000.00

```
/*
1.
Output as the following
--AgentName Suburb01   Suburb02
--Name01    860000.00  400000.00
--Name02    830000.00  1099000.00
--Name03    1555000.00 1379000.00
2.
Pivot need derived table
```

```
2.1.
The PIVOT query for HouseSoldRecord1 converts the unique column values (Suburb01, Suburb02, Suburb03)
in SoldSuburb column into Columns in the output,
along with performing aggregations on the SoldPrice column.
The Outer query, simply, selects AgentName column from HouseSoldRecord1 table,
along with pivoted columns from the PivotTable.
2.2.
In real world, Table should have any number of columns.
However,
HouseSoldRecord1 only has 3 columns, AgentName, SoldSuburb, and SoldPrice.
Not every table only has 3 columns.
There will be a 'logic error' if the table has more than 3 columns.
Let's try it.
*/
```

```
==================================================================
```

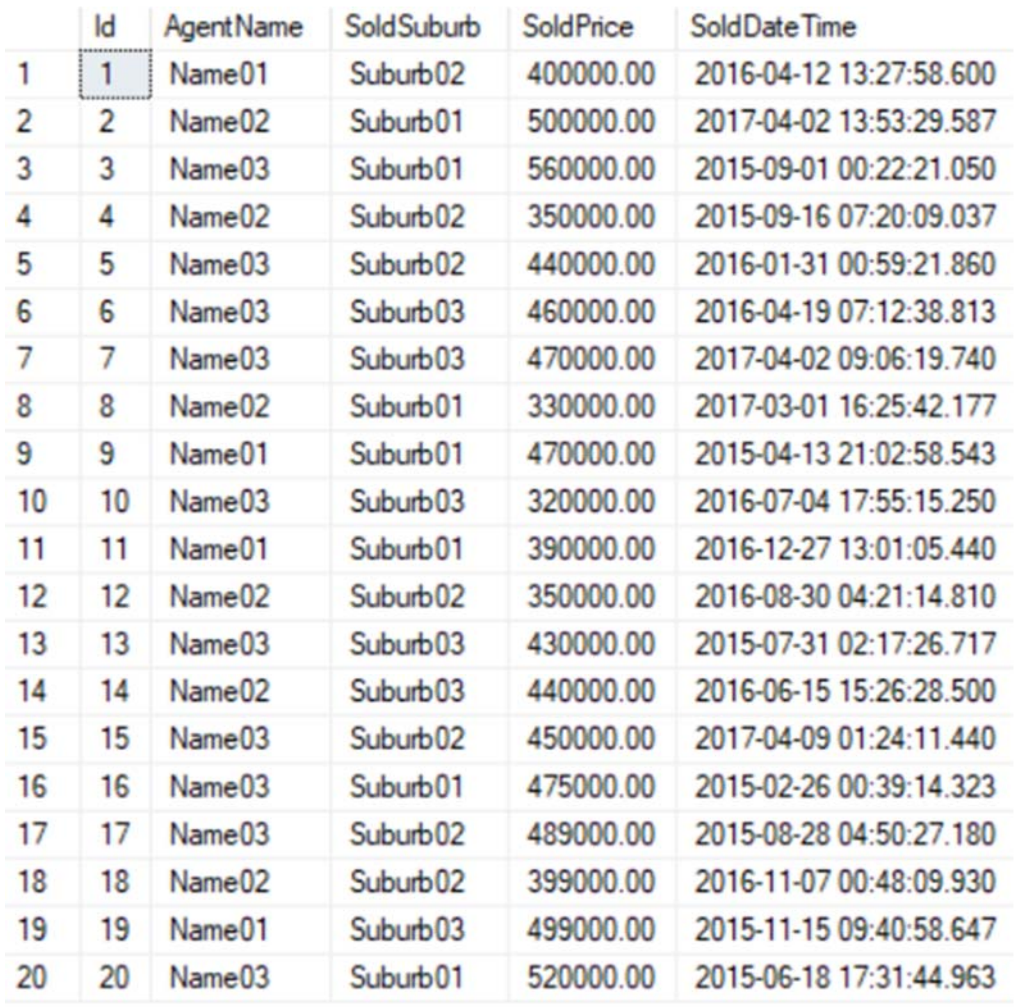
2. Pivot : HouseSoldRecord2 Table

```
--==================================================================
--T018_02_Pivot : HouseSoldRecord2 Table
--==================================================================
```

2.1. Create Sample Data

```
--==================================================================
--T018_02_01
--Create Sample Data
IF ( EXISTS ( SELECT    *
              FROM      INFORMATION_SCHEMA.TABLES
              WHERE     TABLE_NAME = 'HouseSoldRecord2' ) )
    BEGIN
        TRUNCATE TABLE dbo.HouseSoldRecord2;
        DROP TABLE HouseSoldRecord2;
    END;
GO -- Run the previous command and begins new batch
CREATE TABLE HouseSoldRecord2
    (
      Id INT IDENTITY(1, 1)
             PRIMARY KEY ,
      AgentName NVARCHAR(100) ,
      SoldSuburb NVARCHAR(100) ,
      SoldPrice MONEY ,
      SoldDateTime DATETIME NULL
    );
GO -- Run the previous command and begins new batch
INSERT  HouseSoldRecord2
VALUES  ( N'Name01', N'Suburb02', 400000,
          CAST(N'2016-04-12 13:27:58.600' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name02', N'Suburb01', 500000,
          CAST(N'2017-04-02 13:53:29.587' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name03', N'Suburb01', 560000,
          CAST(N'2015-09-01 00:22:21.050' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name02', N'Suburb02', 350000,
```

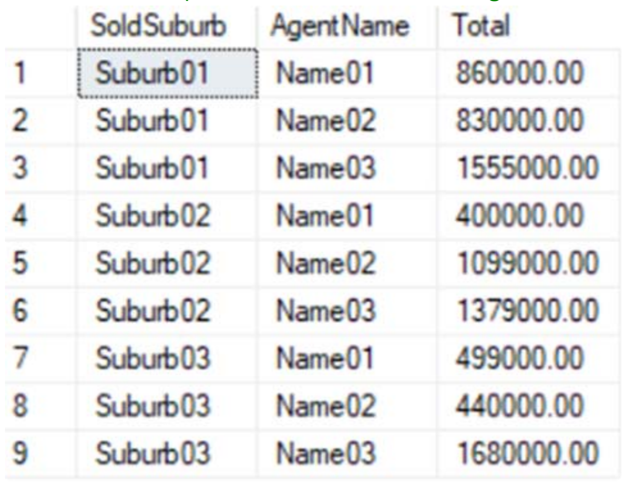
```sql
          CAST(N'2015-09-16 07:20:09.037' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name03', N'Suburb02', 440000,
          CAST(N'2016-01-31 00:59:21.860' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name03', N'Suburb03', 460000,
          CAST(N'2016-04-19 07:12:38.813' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name03', N'Suburb03', 470000,
          CAST(N'2017-04-02 09:06:19.740' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name02', N'Suburb01', 330000,
          CAST(N'2017-03-01 16:25:42.177' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name01', N'Suburb01', 470000,
          CAST(N'2015-04-13 21:02:58.543' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name03', N'Suburb03', 320000,
          CAST(N'2016-07-04 17:55:15.250' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name01', N'Suburb01', 390000,
          CAST(N'2016-12-27 13:01:05.440' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name02', N'Suburb02', 350000,
          CAST(N'2016-08-30 04:21:14.810' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name03', N'Suburb03', 430000,
          CAST(N'2015-07-31 02:17:26.717' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name02', N'Suburb03', 440000,
          CAST(N'2016-06-15 15:26:28.500' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name03', N'Suburb02', 450000,
          CAST(N'2017-04-09 01:24:11.440' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name03', N'Suburb01', 475000,
          CAST(N'2015-02-26 00:39:14.323' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name03', N'Suburb02', 489000,
          CAST(N'2015-08-28 04:50:27.180' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name02', N'Suburb02', 399000,
          CAST(N'2016-11-07 00:48:09.930' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name01', N'Suburb03', 499000,
          CAST(N'2015-11-15 09:40:58.647' AS DATETIME) );
INSERT  HouseSoldRecord2
VALUES  ( N'Name03', N'Suburb01', 520000,
          CAST(N'2015-06-18 17:31:44.963' AS DATETIME) );
GO -- Run the previous command and begins new batch
SELECT  *
FROM    HouseSoldRecord2;
GO -- Run the previous command and begins new batch
```



	Id	AgentName	SoldSuburb	SoldPrice	SoldDateTime
1	1	Name01	Suburb02	400000.00	2016-04-12 13:27:58.600
2	2	Name02	Suburb01	500000.00	2017-04-02 13:53:29.587
3	3	Name03	Suburb01	560000.00	2015-09-01 00:22:21.050
4	4	Name02	Suburb02	350000.00	2015-09-16 07:20:09.037
5	5	Name03	Suburb02	440000.00	2016-01-31 00:59:21.860
6	6	Name03	Suburb03	460000.00	2016-04-19 07:12:38.813
7	7	Name03	Suburb03	470000.00	2017-04-02 09:06:19.740
8	8	Name02	Suburb01	330000.00	2017-03-01 16:25:42.177
9	9	Name01	Suburb01	470000.00	2015-04-13 21:02:58.543
10	10	Name03	Suburb03	320000.00	2016-07-04 17:55:15.250
11	11	Name01	Suburb01	390000.00	2016-12-27 13:01:05.440
12	12	Name02	Suburb02	350000.00	2016-08-30 04:21:14.810
13	13	Name03	Suburb03	430000.00	2015-07-31 02:17:26.717
14	14	Name02	Suburb03	440000.00	2016-06-15 15:26:28.500
15	15	Name03	Suburb02	450000.00	2017-04-09 01:24:11.440
16	16	Name03	Suburb01	475000.00	2015-02-26 00:39:14.323
17	17	Name03	Suburb02	489000.00	2015-08-28 04:50:27.180
18	18	Name02	Suburb02	399000.00	2016-11-07 00:48:09.930
19	19	Name01	Suburb03	499000.00	2015-11-15 09:40:58.647
20	20	Name03	Suburb01	520000.00	2015-06-18 17:31:44.963

2.2. GROUP BY

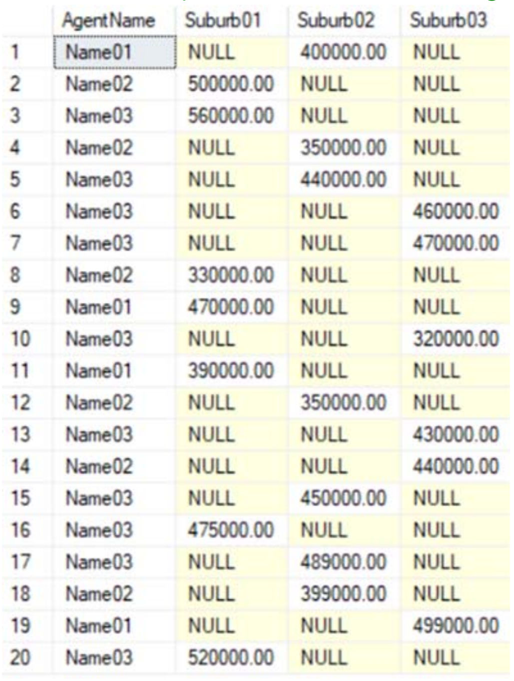
```
--==================================================================
--T018_02_02
--HouseSoldRecord2 Table
--GROUP BY
SELECT  SoldSuburb ,
        AgentName ,
        SUM(SoldPrice) AS Total
FROM    HouseSoldRecord2
GROUP BY SoldSuburb ,
        AgentName
ORDER BY SoldSuburb ,
        AgentName;
GO -- Run the previous command and begins new batch
```



	SoldSuburb	AgentName	Total
1	Suburb01	Name01	860000.00
2	Suburb01	Name02	830000.00
3	Suburb01	Name03	1555000.00
4	Suburb02	Name01	400000.00
5	Suburb02	Name02	1099000.00
6	Suburb02	Name03	1379000.00
7	Suburb03	Name01	499000.00
8	Suburb03	Name02	440000.00
9	Suburb03	Name03	1680000.00

2.3. Logic Error : Pivot need derived table

```
--==================================================================
--T018_02_03
--HouseSoldRecord2 Table
--Logic Error : Pivot need derived table
SELECT  AgentName ,
        Suburb01 ,
        Suburb02 ,
        Suburb03
FROM    HouseSoldRecord2 PIVOT
( SUM(SoldPrice) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable;
GO -- Run the previous command and begins new batch
```

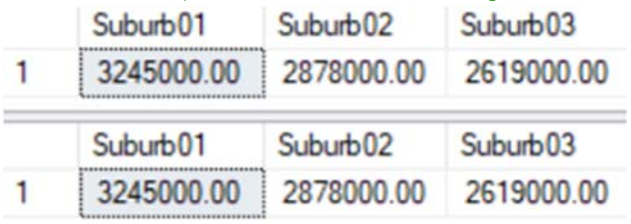


	AgentName	Suburb01	Suburb02	Suburb03
1	Name01	NULL	400000.00	NULL
2	Name02	500000.00	NULL	NULL
3	Name03	560000.00	NULL	NULL
4	Name02	NULL	350000.00	NULL
5	Name03	NULL	440000.00	NULL
6	Name03	NULL	NULL	460000.00
7	Name03	NULL	NULL	470000.00
8	Name02	330000.00	NULL	NULL
9	Name01	470000.00	NULL	NULL
10	Name03	NULL	NULL	320000.00
11	Name01	390000.00	NULL	NULL
12	Name02	NULL	350000.00	NULL
13	Name03	NULL	NULL	430000.00
14	Name02	NULL	NULL	440000.00
15	Name03	NULL	450000.00	NULL
16	Name03	475000.00	NULL	NULL
17	Name03	NULL	489000.00	NULL
18	Name02	NULL	399000.00	NULL
19	Name01	NULL	NULL	499000.00
20	Name03	520000.00	NULL	NULL

```
/*
1.
Logic Error.
IOutput as the following
--AgentName Suburb01   Suburb02   Suburb03
--Name01     NULL   400000.00    NULL
--Name02     500000.00    NULL   NULL
...
--Name02     NULL   399000.00    NULL
--Name01     NULL   NULL    499000.00
--Name03     520000.00    NULL   NULL
Total 20 rows.
This is not what we expect.
2.
Pivot need derived table
2.1.
HouseSoldRecord2 has 5 columns,
Id, AgentName, SoldSuburb, SoldPrice MONEY, and SoldDateTime.
This is because of the presence of Id and SoldDateTime column in HouseSoldRecord2,
which is also considered when performing pivoting and group by.
To eliminate this from the calculations,
we have used derived table, which only selects,
AgentName, SoldSuburb, and SoldPrice.
The rest of the query is very similar to what we have already seen.
*/
```

2.4. Pivot need derived table

```
--==================================================================
--T018_02_04
--HouseSoldRecord2 Table
--Pivot need derived table
-----------------------------------------------------------
--T018_02_04_01 : HouseSoldRecord2 Table
--Pivot need derived table, the following clauses are equivalent:
--2 columns in derived table : SoldSuburb, SoldPrice
-----------------------------------------
--T018_02_04_01_01
SELECT  Suburb01 ,
        Suburb02 ,
        Suburb03
FROM    --derived table
        ( SELECT    SoldSuburb ,
                    SoldPrice AS TotalSales
          FROM      HouseSoldRecord2
        ) AS BaseData PIVOT
             ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable;
GO -- Run the previous command and begins new batch
-----------------------------------------
--T018_02_04_01_02
SELECT  *
FROM    --derived table
        ( SELECT    SoldSuburb ,
                    SoldPrice AS TotalSales
          FROM      HouseSoldRecord2
        ) AS BaseData PIVOT
             ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable;
GO -- Run the previous command and begins new batch
```



	Suburb01	Suburb02	Suburb03
1	3245000.00	2878000.00	2619000.00

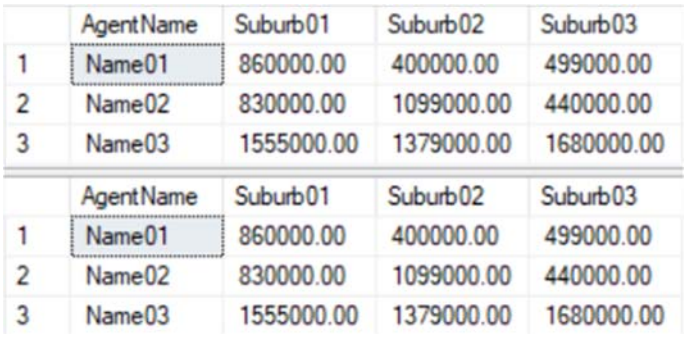
	Suburb01	Suburb02	Suburb03
1	3245000.00	2878000.00	2619000.00

```
/*
1.
1.1.
2 columns in derived table : SoldSuburb, SoldPrice
Output as the following
--Suburb01   Suburb02   Suburb03
--3245000.00 2878000.00 2619000.00
1.2.
The only different is the following.
1.2.1.
1st Query
--SELECT  Suburb01 ,
--        Suburb02 ,
--        Suburb03
1.2.2.
2nd Query
--SELECT  *
we can always replace
outter "SELECT C1,C2...etc" by "SELECT  *".
The inner query "SELECT C1,C2...etc" is more important
which decide how many columns pivot to left side.
2.
```

```
Let's see next sample to conclude the Pivot Syntax.
*/
```

2.5. 3 columns in derived table

```
--===================================================================
--T018_02_05 : HouseSoldRecord2 Table
--Pivot need derived table, the following clauses are equivalent:
--3 columns in derived table : AgentName, SoldSuburb, SoldPrice
-----------------------------------------
--T018_02_05_01
SELECT  AgentName ,
        Suburb01 ,
        Suburb02 ,
        Suburb03
FROM    --derived table
        ( SELECT    AgentName ,
                     SoldSuburb ,
                     SoldPrice AS TotalSales
          FROM       HouseSoldRecord2
        ) AS BaseData PIVOT
             ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable;
GO -- Run the previous command and begins new batch
-----------------------------------------
--T018_02_05_02
SELECT  *
FROM    --derived table
        ( SELECT    AgentName ,
                     SoldSuburb ,
                     SoldPrice AS TotalSales
          FROM       HouseSoldRecord2
        ) AS BaseData PIVOT
             ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable;
GO -- Run the previous command and begins new batch
```



	AgentName	Suburb01	Suburb02	Suburb03
1	Name01	860000.00	400000.00	499000.00
2	Name02	830000.00	1099000.00	440000.00
3	Name03	1555000.00	1379000.00	1680000.00

	AgentName	Suburb01	Suburb02	Suburb03
1	Name01	860000.00	400000.00	499000.00
2	Name02	830000.00	1099000.00	440000.00
3	Name03	1555000.00	1379000.00	1680000.00

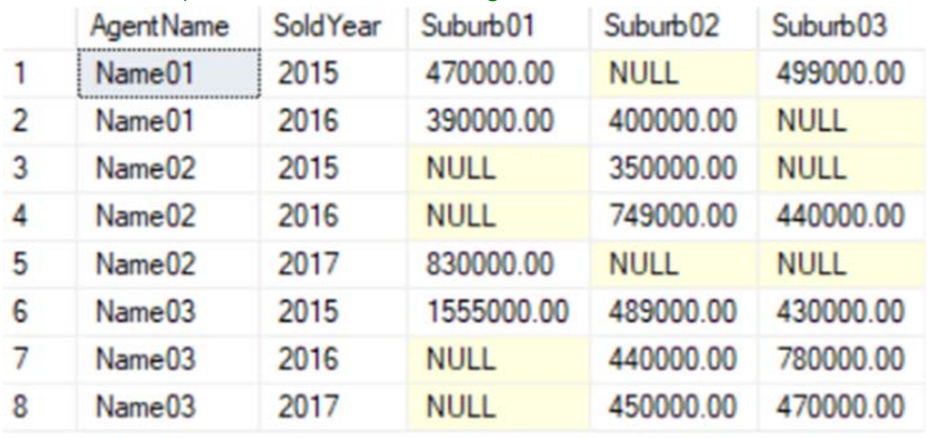
```
/*
1.
1.1.
3 columns in derived table : AgentName, SoldSuburb, SoldPrice
Output as the following
--AgentName Suburb01   Suburb02   Suburb03
--Name01    860000.00  400000.00  499000.00
--Name02    830000.00  1099000.00 440000.00
--Name03    1555000.00 1379000.00 1680000.00
1.2.
The only different is the following.
1.2.1.
1st Query
--SELECT  AgentName ,
--        Suburb01 ,
--        Suburb02 ,
--        Suburb03
```

```
1.2.2.
2nd Query
--SELECT  *
we can always replace
outter "SELECT C1,C2...etc" by "SELECT  *".
The inner query "SELECT C1,C2...etc" is more important
which decide how many columns pivot to left side.
-----------------
2.
Pivot Syntax1
Reference:
https://technet.microsoft.com/en-us/library/ms177410(v=sql.105).aspx
--SELECT  *
--FROM    --derived table
--        ( SELECT    T1C1 , --1st pivoted column
--                    T1C2 , --2nd pivoted column
--                    ....
--                    T1Cn-2 , --N-2 th pivoted column
--                    T1Cn-1 , --Column n-1 that contains the values that will become column headers
--                    T1Cn AS T1CnAliasName --Column n that used for aggregation function
--          FROM      T1
--       ) AS BaseData PIVOT
--       ( SUM(T1CnAliasName) FOR T1Cn-2 IN ( T1Cn-1V1, T1Cn-1V2, T1Cn-1V3 ) ) AS PivotTable;
--ORDER BY T1C1, T1C2, ... , T1Cn-2
--GO -- Run the previous command and begins new batch
T stand for Table
C stand for column
V stand for Value
T1C1, T1C2, ... , T1Cn-2 will become the pivoted columns in left hand side.
Column n-1,T1Cn-1, that contains the values that will become column headers.
Column n,T1Cn, that used for aggregation function.
Using "ORDER BY T1Cn-1V1, T1Cn-1V2, T1Cn-1V3, T1Cn" might cause some logic error that we don't expect.
Better just use "ORDER BY T1C1, T1C2, ... , T1Cn-2".
---------------------------
2.1.
E.g.
--SELECT  *
--FROM    --derived table
--        ( SELECT    AgentName ,--1st pivoted column
--                    SoldSuburb ,      --Column n-1 that contains the values that will become column
headers
--                    SoldPrice AS TotalSales  --Column n that used for aggregation function
--          FROM      HouseSoldRecord2
--        ) AS BaseData PIVOT
--           ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable;
--GO -- Run the previous command and begins new batch
AgentName will become the pivoted columns in left hand side.
Column SoldSuburb that contains the values that will become column headers, Suburb01, Suburb02, Suburb03.
Column SoldPrice that used for aggregation function.
Using "ORDER BY Suburb01, Suburb02, Suburb03, SoldPrice" might cause some logic error that we don't
expect.
Better just use "ORDER BY AgentName".
*/
```

2.6. 4 columns in derived table

```
--==================================================================
--T018_02_06
--HouseSoldRecord2 Table
--Pivot need derived table
--4 columns in derived table : AgentName, YEAR(SoldDateTime), SoldSuburb, SoldPrice
SELECT  *
FROM    --derived table
        ( SELECT    AgentName ,
                    YEAR(SoldDateTime) AS SoldYear ,
                    SoldSuburb ,
```

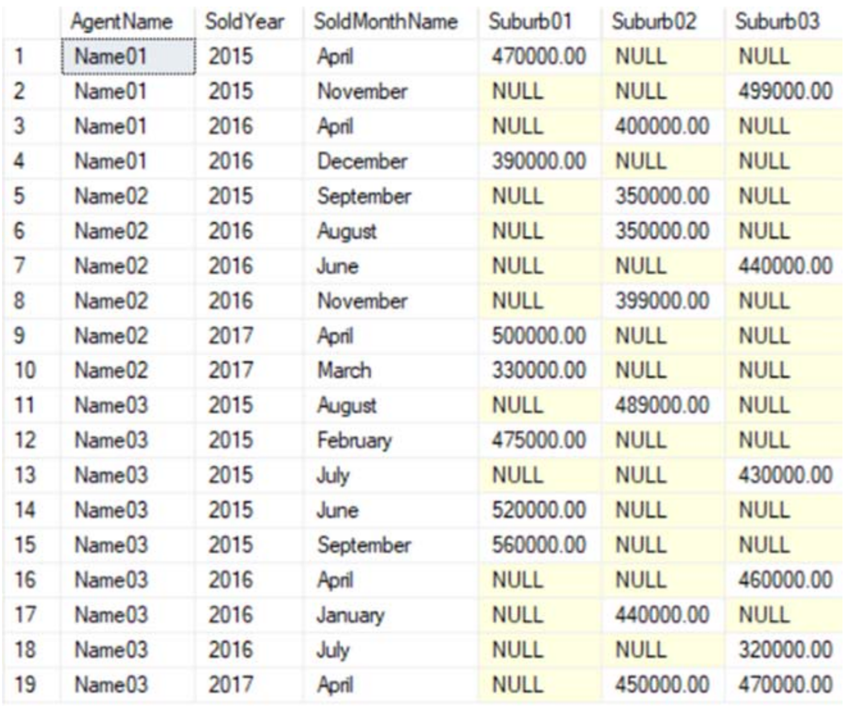
```sql
                    SoldPrice AS TotalSales
          FROM      HouseSoldRecord2
        ) AS BaseData PIVOT
            ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable
ORDER BY AgentName ,
        SoldYear;
GO -- Run the previous command and begins new batch
```



	AgentName	SoldYear	Suburb01	Suburb02	Suburb03
1	Name01	2015	470000.00	NULL	499000.00
2	Name01	2016	390000.00	400000.00	NULL
3	Name02	2015	NULL	350000.00	NULL
4	Name02	2016	NULL	749000.00	440000.00
5	Name02	2017	830000.00	NULL	NULL
6	Name03	2015	1555000.00	489000.00	430000.00
7	Name03	2016	NULL	440000.00	780000.00
8	Name03	2017	NULL	450000.00	470000.00

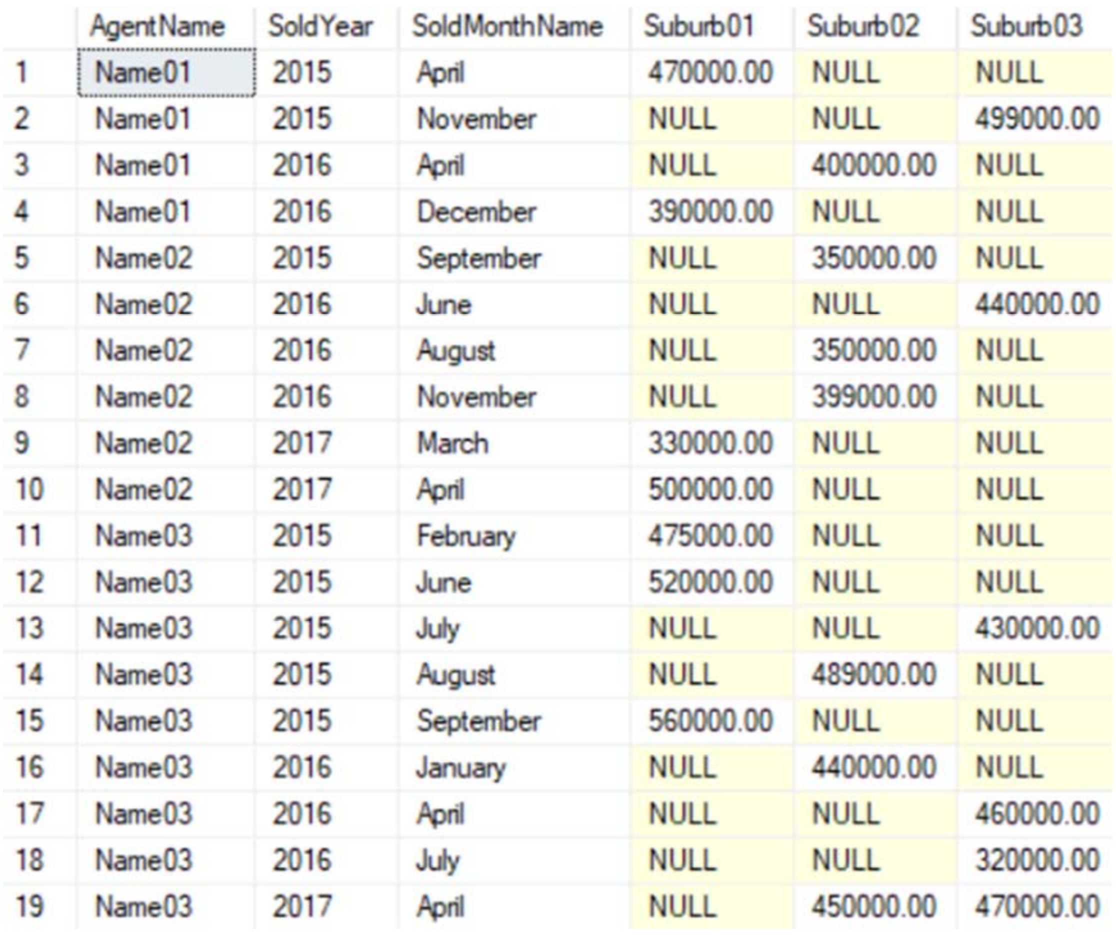
2.7. 6 columns in derived table

```sql
--==================================================================
--T018_02_07
--HouseSoldRecord2 Table
--Pivot need derived table
--6 columns in derived table :
--AgentName, YEAR(SoldDateTime), DATEPART(MONTH, SoldDateTime), DATENAME(MM,SoldDateTime), SoldSuburb,
SoldPrice
------------------------------------
--T018_02_07_01
SELECT  *
FROM    --derived table
        ( SELECT    AgentName ,
                    YEAR(SoldDateTime) AS SoldYear ,
                    DATENAME(MM, SoldDateTime) AS SoldMonthName ,
                    SoldSuburb ,
                    SoldPrice AS TotalSales
          FROM      HouseSoldRecord2
        ) AS BaseData PIVOT
            ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable
ORDER BY AgentName ,
        SoldYear ,
        SoldMonthName;
GO -- Run the previous command and begins new batch
```



	AgentName	SoldYear	SoldMonthName	Suburb01	Suburb02	Suburb03
1	Name01	2015	April	470000.00	NULL	NULL
2	Name01	2015	November	NULL	NULL	499000.00
3	Name01	2016	April	NULL	400000.00	NULL
4	Name01	2016	December	390000.00	NULL	NULL
5	Name02	2015	September	NULL	350000.00	NULL
6	Name02	2016	August	NULL	350000.00	NULL
7	Name02	2016	June	NULL	NULL	440000.00
8	Name02	2016	November	NULL	399000.00	NULL
9	Name02	2017	April	500000.00	NULL	NULL
10	Name02	2017	March	330000.00	NULL	NULL
11	Name03	2015	August	NULL	489000.00	NULL
12	Name03	2015	February	475000.00	NULL	NULL
13	Name03	2015	July	NULL	NULL	430000.00
14	Name03	2015	June	520000.00	NULL	NULL
15	Name03	2015	September	560000.00	NULL	NULL
16	Name03	2016	April	NULL	NULL	460000.00
17	Name03	2016	January	NULL	440000.00	NULL
18	Name03	2016	July	NULL	NULL	320000.00
19	Name03	2017	April	NULL	450000.00	470000.00

```
------------------------------------
--T018_02_07_02
SELECT  AgentName ,
        SoldYear ,
        SoldMonthName ,
        Suburb01 ,
        Suburb02 ,
        Suburb03
FROM    --derived table
        ( SELECT    AgentName ,
                    YEAR(SoldDateTime) AS SoldYear ,
                    DATEPART(MONTH, SoldDateTime) AS SoldMonth ,
                    DATENAME(MM, SoldDateTime) AS SoldMonthName ,
                    SoldSuburb ,
                    SoldPrice AS TotalSales
          FROM      HouseSoldRecord2
        ) AS BaseData PIVOT
            ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable
ORDER BY AgentName ,
        SoldYear ,
        SoldMonth;
GO -- Run the previous command and begins new batch
```



	AgentName	SoldYear	SoldMonthName	Suburb01	Suburb02	Suburb03
1	Name01	2015	April	470000.00	NULL	NULL
2	Name01	2015	November	NULL	NULL	499000.00
3	Name01	2016	April	NULL	400000.00	NULL
4	Name01	2016	December	390000.00	NULL	NULL
5	Name02	2015	September	NULL	350000.00	NULL
6	Name02	2016	June	NULL	NULL	440000.00
7	Name02	2016	August	NULL	350000.00	NULL
8	Name02	2016	November	NULL	399000.00	NULL
9	Name02	2017	March	330000.00	NULL	NULL
10	Name02	2017	April	500000.00	NULL	NULL
11	Name03	2015	February	475000.00	NULL	NULL
12	Name03	2015	June	520000.00	NULL	NULL
13	Name03	2015	July	NULL	NULL	430000.00
14	Name03	2015	August	NULL	489000.00	NULL
15	Name03	2015	September	560000.00	NULL	NULL
16	Name03	2016	January	NULL	440000.00	NULL
17	Name03	2016	April	NULL	NULL	460000.00
18	Name03	2016	July	NULL	NULL	320000.00
19	Name03	2017	April	NULL	450000.00	470000.00

```
/*
1.
Pivot Syntax2
Reference:
https://technet.microsoft.com/en-us/library/ms177410(v=sql.105).aspx
If you don't want to display all pivoted columns in left hand side.
Then you cannot use "SELECT *",
you have to use "SELECT T1C1, T1C2, ..." in outter query.
--SELECT  T1C1, T1C2, ...T1Cn-3, T1Cn-1V1, T1Cn-1V2, T1Cn-1V3
---- You hide T1Cn-2 pivoted column, but You still can ORDER BY T1Cn-2.
--FROM    --derived table
--        ( SELECT    T1C1 , --1st pivoted column
--                    T1C2 , --2nd pivoted column
--                    ....
--                    T1Cn-3 , --N-3 th pivoted column
--                    T1Cn-2 , --N-2 th pivoted column which you don't want to display.
--                    T1Cn-1 , --Column n-1 that contains the values that will become column headers
--                    T1Cn AS T1CnAliasName --Column n that used for aggregation function
--          FROM      T1
--       ) AS BaseData PIVOT
--       ( SUM(T1CnAliasName) FOR T1Cn-2 IN ( T1Cn-1V1, T1Cn-1V2, T1Cn-1V3 ) ) AS PivotTable;
--ORDER BY T1C1, T1C2, ... , T1Cn-2
--GO -- Run the previous command and begins new batch
T stand for Table
C stand for column
V stand for Value
T1C1, T1C2, ... , T1Cn-3 will become the pivoted columns in left hand side.
You hide T1Cn-2 pivoted column, but You still can ORDER BY T1Cn-2.
Column n-1,T1Cn-1, that contains the values that will become column headers.
Column n,T1Cn, that used for aggregation function.
Using "ORDER BY T1Cn-1V1, T1Cn-1V2, T1Cn-1V3, T1Cn" might cause some logic error that we don't expect.
Better just use "ORDER BY T1C1, T1C2, ... , T1Cn-2".
---------------------------
1.1.
E.g.
--SELECT  AgentName, SoldYear, SoldMonthName, Suburb01, Suburb02, Suburb03
--FROM    --derived table
```

```
--        ( SELECT    AgentName ,
--                    YEAR(SoldDateTime) AS SoldYear ,
--                    DATEPART(MONTH, SoldDateTime) AS SoldMonth ,
--                                 DATENAME(MM,SoldDateTime) AS SoldMonthName ,
--                    SoldSuburb ,
--                    SoldPrice AS TotalSales
--          FROM      HouseSoldRecord2
--        ) AS BaseData PIVOT
--           ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable
--ORDER BY AgentName , SoldYear, SoldMonth
--GO -- Run the previous command and begins new batch
2.1.1.
AgentName, SoldYear, SoldMonthName will become the pivoted columns in left hand side.
Column SoldSuburb that contains the values that will become column headers, Suburb01, Suburb02, Suburb03.
Column SoldPrice that used for aggregation function.
Using "ORDER BY Suburb01, Suburb02, Suburb03, SoldSuburb" might cause some logic error that we don't
expect.
Better just use "AgentName, SoldYear, SoldMonth".
2.1.2.
If using "ORDER BY AgentName , SoldYear, SoldMonthName"
SoldMonthName will become the alphabet order.
E.g. "April", "December", "July", "June" ,"November" ...etc.
This is not what we want,
we want the order by SoldMonth number but display SoldMonthName
E.g. "April", ... , "June", "July",..., "November" ,"December"
Thus, inner derived table SELECT both  SoldMonth and SoldMonthName.
But outer pivot table only SELECT SoldMonthName.
In addition, we still can ORDER BY SoldMonth.
*/
```

3. Pivot : HouseSoldRecord3 Table

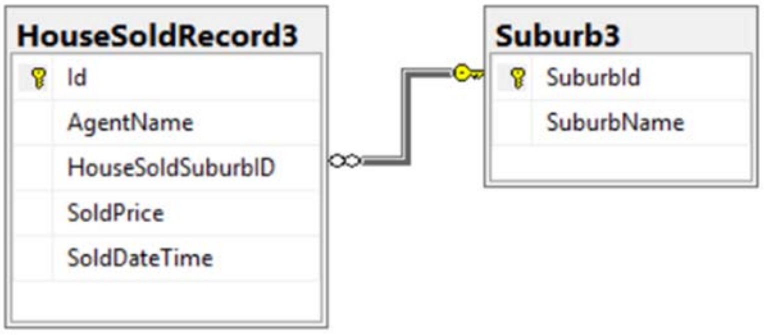
```
--==================================================================
--T018_03_Pivot : HouseSoldRecord3 Table
--==================================================================
```

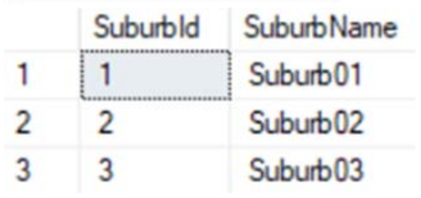
3.1. Create Sample Data

```
--==================================================================
--T018_03_01
--Create Sample Data
--If Table exists then DROP it
IF ( EXISTS ( SELECT    *
              FROM      INFORMATION_SCHEMA.TABLES
              WHERE     TABLE_NAME = 'HouseSoldRecord3' ) )
    BEGIN
        TRUNCATE TABLE dbo.HouseSoldRecord3;
        DROP TABLE HouseSoldRecord3;
    END;
GO -- Run the previous command and begins new batch
IF ( EXISTS ( SELECT    *
              FROM      INFORMATION_SCHEMA.TABLES
              WHERE     TABLE_NAME = 'Suburb3' ) )
    BEGIN
        TRUNCATE TABLE dbo.Suburb3;
        DROP TABLE Suburb3;
    END;
GO -- Run the previous command and begins new batch
```

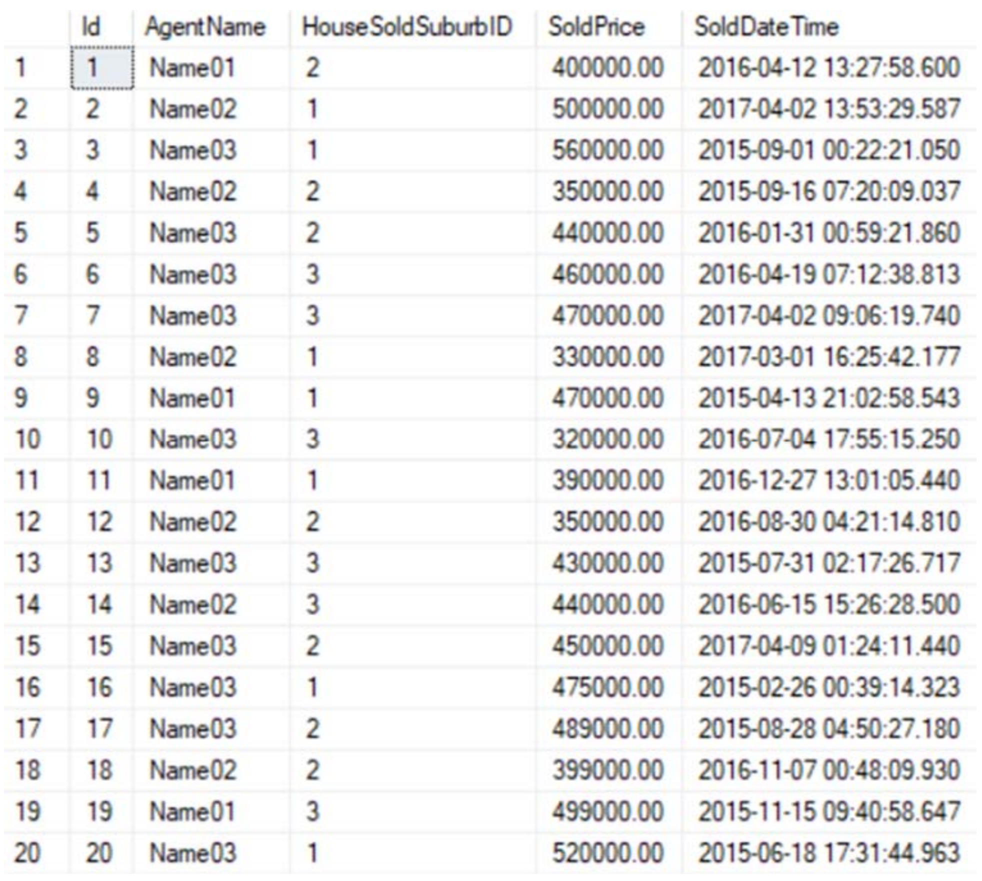
```sql
-----------------------------
CREATE TABLE Suburb3
    (
      SuburbId INT IDENTITY(1, 1)
                   PRIMARY KEY ,
      SuburbName NVARCHAR(100),
    );
GO -- Run the previous command and begins new batch
INSERT  Suburb3
VALUES  ( N'Suburb01' );
INSERT  Suburb3
VALUES  ( N'Suburb02' );
INSERT  Suburb3
VALUES  ( N'Suburb03' );
GO -- Run the previous command and begins new batch
-----------------------------
CREATE TABLE HouseSoldRecord3
    (
      Id INT IDENTITY(1, 1)
             PRIMARY KEY ,
      AgentName NVARCHAR(100) ,
      HouseSoldSuburbID INT FOREIGN KEY REFERENCES Suburb3 ( SuburbId ) ,
      SoldPrice MONEY ,
      SoldDateTime DATETIME NULL
    );
GO -- Run the previous command and begins new batch
INSERT  HouseSoldRecord3
VALUES  ( N'Name01', 2, 400000, CAST(N'2016-04-12 13:27:58.600' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name02', 1, 500000, CAST(N'2017-04-02 13:53:29.587' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name03', 1, 560000, CAST(N'2015-09-01 00:22:21.050' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name02', 2, 350000, CAST(N'2015-09-16 07:20:09.037' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name03', 2, 440000, CAST(N'2016-01-31 00:59:21.860' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name03', 3, 460000, CAST(N'2016-04-19 07:12:38.813' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name03', 3, 470000, CAST(N'2017-04-02 09:06:19.740' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name02', 1, 330000, CAST(N'2017-03-01 16:25:42.177' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name01', 1, 470000, CAST(N'2015-04-13 21:02:58.543' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name03', 3, 320000, CAST(N'2016-07-04 17:55:15.250' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name01', 1, 390000, CAST(N'2016-12-27 13:01:05.440' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name02', 2, 350000, CAST(N'2016-08-30 04:21:14.810' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name03', 3, 430000, CAST(N'2015-07-31 02:17:26.717' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name02', 3, 440000, CAST(N'2016-06-15 15:26:28.500' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name03', 2, 450000, CAST(N'2017-04-09 01:24:11.440' AS DATETIME) );
INSERT  HouseSoldRecord3
```

```
VALUES  ( N'Name03', 1, 475000, CAST(N'2015-02-26 00:39:14.323' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name03', 2, 489000, CAST(N'2015-08-28 04:50:27.180' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name02', 2, 399000, CAST(N'2016-11-07 00:48:09.930' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name01', 3, 499000, CAST(N'2015-11-15 09:40:58.647' AS DATETIME) );
INSERT  HouseSoldRecord3
VALUES  ( N'Name03', 1, 520000, CAST(N'2015-06-18 17:31:44.963' AS DATETIME) );
GO -- Run the previous command and begins new batch
SELECT  *
FROM    Suburb3;
SELECT  *
FROM    HouseSoldRecord3;
GO -- Run the previous command and begins new batch
```





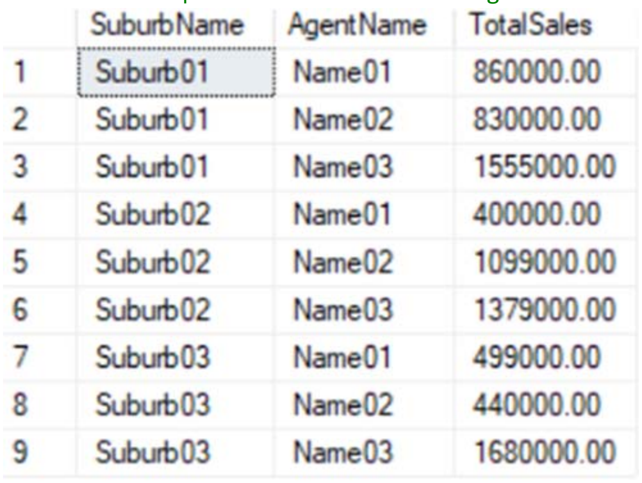
	SuburbId	SuburbName
1	1	Suburb01
2	2	Suburb02
3	3	Suburb03



	Id	AgentName	HouseSoldSuburbID	SoldPrice	SoldDateTime
1	1	Name01	2	400000.00	2016-04-12 13:27:58.600
2	2	Name02	1	500000.00	2017-04-02 13:53:29.587
3	3	Name03	1	560000.00	2015-09-01 00:22:21.050
4	4	Name02	2	350000.00	2015-09-16 07:20:09.037
5	5	Name03	2	440000.00	2016-01-31 00:59:21.860
6	6	Name03	3	460000.00	2016-04-19 07:12:38.813
7	7	Name03	3	470000.00	2017-04-02 09:06:19.740
8	8	Name02	1	330000.00	2017-03-01 16:25:42.177
9	9	Name01	1	470000.00	2015-04-13 21:02:58.543
10	10	Name03	3	320000.00	2016-07-04 17:55:15.250
11	11	Name01	1	390000.00	2016-12-27 13:01:05.440
12	12	Name02	2	350000.00	2016-08-30 04:21:14.810
13	13	Name03	3	430000.00	2015-07-31 02:17:26.717
14	14	Name02	3	440000.00	2016-06-15 15:26:28.500
15	15	Name03	2	450000.00	2017-04-09 01:24:11.440
16	16	Name03	1	475000.00	2015-02-26 00:39:14.323
17	17	Name03	2	489000.00	2015-08-28 04:50:27.180
18	18	Name02	2	399000.00	2016-11-07 00:48:09.930
19	19	Name01	3	499000.00	2015-11-15 09:40:58.647
20	20	Name03	1	520000.00	2015-06-18 17:31:44.963

3.2. GROUP BY

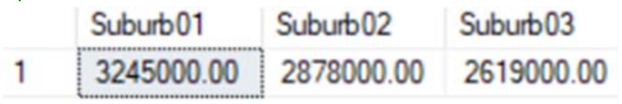
```sql
--================================================================
--T018_03_02
--HouseSoldRecord3 Table
--GROUP BY
SELECT  s3.SuburbName ,
        hsr3.AgentName ,
        SUM(hsr3.SoldPrice) AS TotalSales
FROM    Suburb3 s3
        INNER JOIN HouseSoldRecord3 hsr3 ON s3.SuburbId = hsr3.HouseSoldSuburbID
GROUP BY s3.SuburbName ,
        hsr3.AgentName
ORDER BY s3.SuburbName ,
        hsr3.AgentName;
GO -- Run the previous command and begins new batch
```



	SuburbName	AgentName	TotalSales
1	Suburb01	Name01	860000.00
2	Suburb01	Name02	830000.00
3	Suburb01	Name03	1555000.00
4	Suburb02	Name01	400000.00
5	Suburb02	Name02	1099000.00
6	Suburb02	Name03	1379000.00
7	Suburb03	Name01	499000.00
8	Suburb03	Name02	440000.00
9	Suburb03	Name03	1680000.00

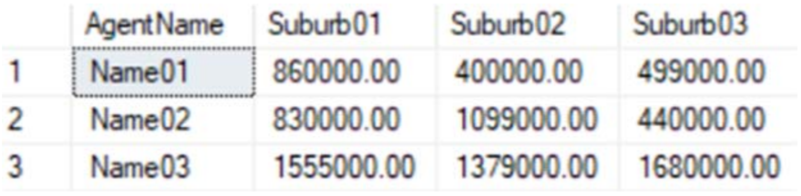
3.3. 2 columns in derived table

```sql
--================================================================
--T018_03_03
--HouseSoldRecord2 Table
--Pivot need derived table
--2 columns in derived table : SoldSuburb, SoldPrice
SELECT  *
FROM    --derived table
        ( SELECT    s3.SuburbName AS SoldSuburb ,
                     SoldPrice AS TotalSales
          FROM      Suburb3 s3
                    INNER JOIN HouseSoldRecord3 hsr3 ON s3.SuburbId = hsr3.HouseSoldSuburbID
        ) AS BaseData PIVOT
             ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable;
GO -- Run the previous command and begins new batch
/*
2 columns in derived table : SoldSuburb, SoldPrice
Output as the following
--Suburb01   Suburb02   Suburb03
--3245000.00 2878000.00 2619000.00
*/
```



	Suburb01	Suburb02	Suburb03
1	3245000.00	2878000.00	2619000.00

3.4. 3 columns in derived table

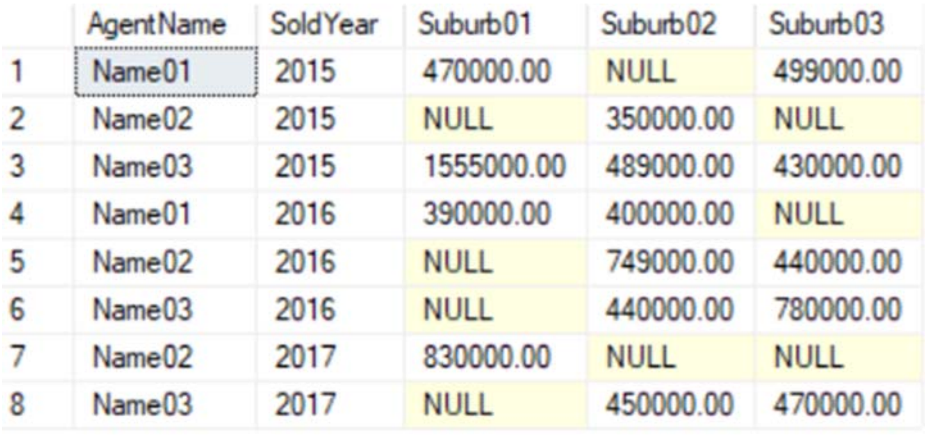
```sql
--================================================================
--T018_03_04
--HouseSoldRecord3 Table
--Pivot need derived table
--3 columns in derived table : SoldSuburb, SoldPrice
SELECT  *
FROM    --derived table
        ( SELECT    hsr3.AgentName ,
                     s3.SuburbName AS SoldSuburb ,
                     SoldPrice AS TotalSales
          FROM       Suburb3 s3
                    INNER JOIN HouseSoldRecord3 hsr3 ON s3.SuburbId = hsr3.HouseSoldSuburbID
        ) AS BaseData PIVOT
              ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable;
GO -- Run the previous command and begins new batch
```


	AgentName	Suburb01	Suburb02	Suburb03
1	Name01	860000.00	400000.00	499000.00
2	Name02	830000.00	1099000.00	440000.00
3	Name03	1555000.00	1379000.00	1680000.00

```
/*
1.
3 columns in derived table : AgentName, SoldSuburb, SoldPrice
Output as the following
--AgentName Suburb01   Suburb02   Suburb03
--Name01    860000.00  400000.00  499000.00
--Name02    830000.00  1099000.00 440000.00
--Name03    1555000.00 1379000.00 1680000.00
-----------------
2.
Pivot Syntax1
Reference:
https://technet.microsoft.com/en-us/library/ms177410(v=sql.105).aspx
--SELECT  *
--FROM    --derived table
--        ( SELECT    T1C1 , --1st pivoted column
--                    T1C2 , --2nd pivoted column
--                    ....
--                    T1Cn-2 , --N-2 th pivoted column
--                    T1Cn-1 , --Column n-1 that contains the values that will become column headers
--                    T1Cn AS T1CnAliasName --Column n that used for aggregation function
--          FROM      T1
--      ) AS BaseData PIVOT
--      ( SUM(T1CnAliasName) FOR T1Cn-2 IN ( T1Cn-1V1, T1Cn-1V2, T1Cn-1V3 ) ) AS PivotTable;
--ORDER BY T1C1, T1C2, ... , T1Cn-2
--GO -- Run the previous command and begins new batch
T stand for Table
C stand for column
V stand for Value
T1C1, T1C2, ... , T1Cn-2 will become the pivoted columns in left hand side.
Column n-1,T1Cn-1, that contains the values that will become column headers.
Column n,T1Cn, that used for aggregation function.
Using "ORDER BY T1Cn-1V1, T1Cn-1V2, T1Cn-1V3, T1Cn" might cause some logic error that we don't expect.
Better just use "ORDER BY T1C1, T1C2, ... , T1Cn-2".
---------------------------
2.1.
E.g.
--SELECT  *
--FROM    --derived table
--        ( SELECT    hsr3.AgentName ,
--                    s3.SuburbName AS SoldSuburb,
--                    SoldPrice AS TotalSales
--          FROM      Suburb3 s3
--                    INNER JOIN HouseSoldRecord3 hsr3 ON s3.SuburbId = hsr3.HouseSoldSuburbID
--        ) AS BaseData PIVOT
--           ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable;
--GO -- Run the previous command and begins new batch
AgentName will become the pivoted columns in left hand side.
Column SoldSuburb that contains the values that will become column headers, Suburb01, Suburb02, Suburb03.
Column SoldPrice that used for aggregation function.
Using "ORDER BY Suburb01, Suburb02, Suburb03, SoldPrice" might cause some logic error that we don't
expect.
Better just use "ORDER BY AgentName".
*/
```

3.5. 4 columns in derived table

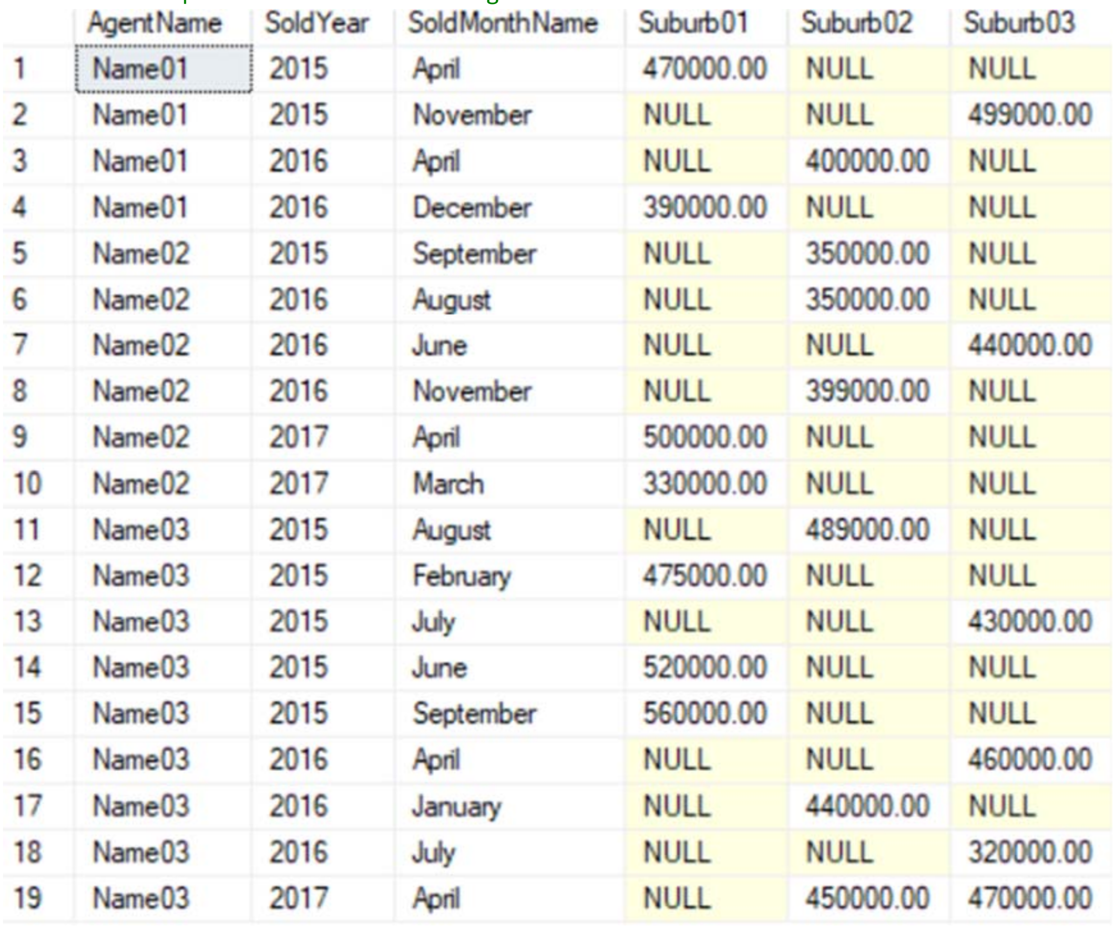
```
--==================================================================
--T018_03_05
--HouseSoldRecord3 Table
--Pivot need derived table
--4 columns in derived table : AgentName, YEAR(SoldDateTime), SoldSuburb, SoldPrice
SELECT  *
FROM    --derived table
        ( SELECT     hsr3.AgentName ,
                     YEAR(hsr3.SoldDateTime) AS SoldYear ,
                      s3.SuburbName AS SoldSuburb ,
                      SoldPrice AS TotalSales
          FROM       Suburb3 s3
                     INNER JOIN HouseSoldRecord3 hsr3 ON s3.SuburbId = hsr3.HouseSoldSuburbID
        ) AS BaseData PIVOT
              ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable;
GO -- Run the previous command and begins new batch
```



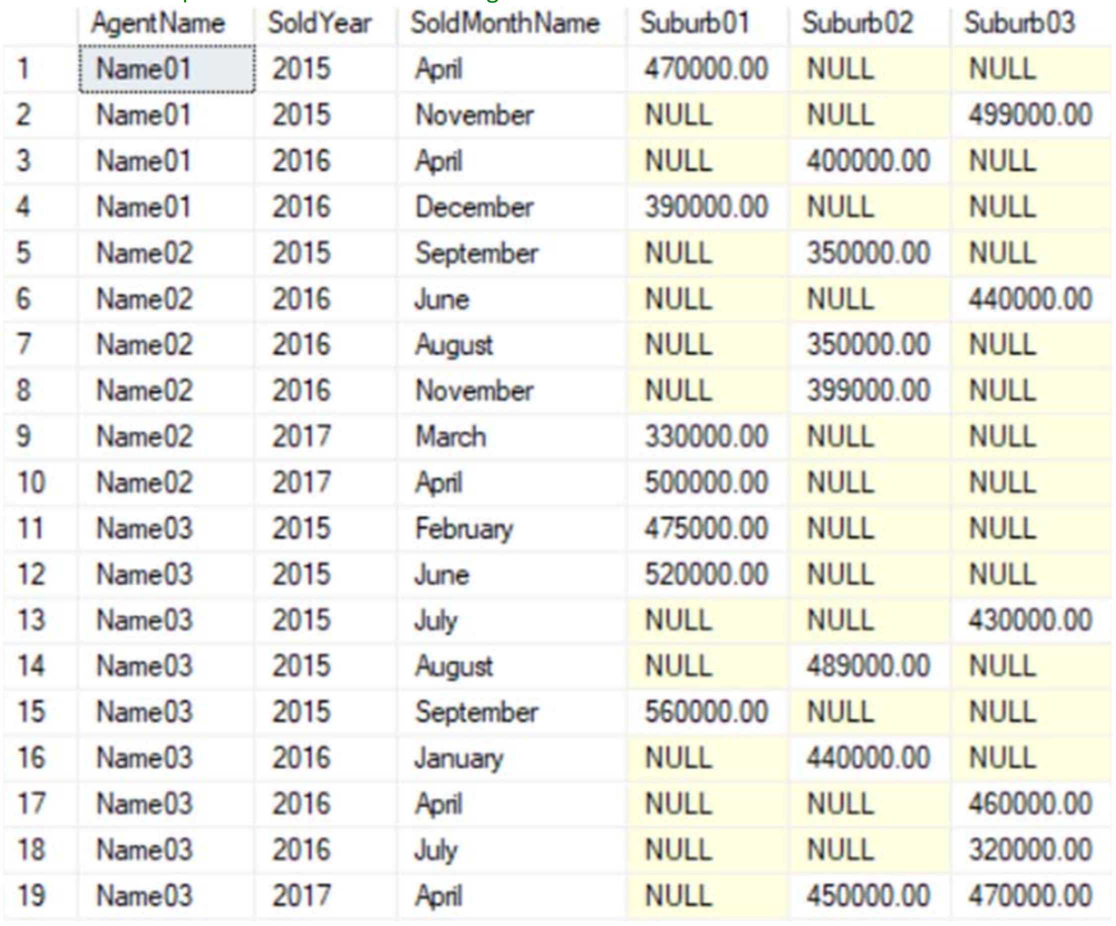
	AgentName	SoldYear	Suburb01	Suburb02	Suburb03
1	Name01	2015	470000.00	NULL	499000.00
2	Name02	2015	NULL	350000.00	NULL
3	Name03	2015	1555000.00	489000.00	430000.00
4	Name01	2016	390000.00	400000.00	NULL
5	Name02	2016	NULL	749000.00	440000.00
6	Name03	2016	NULL	440000.00	780000.00
7	Name02	2017	830000.00	NULL	NULL
8	Name03	2017	NULL	450000.00	470000.00

3.6. 6 columns in derived table

```
--==================================================================
--T018_03_06
--HouseSoldRecord3 Table
--Pivot need derived table
--6 columns in derived table :
--AgentName, YEAR(SoldDateTime), DATEPART(MONTH, SoldDateTime), DATENAME(MM,SoldDateTime), SoldSuburb,
SoldPrice
-------------------------------------
--T018_03_06_01
SELECT  *
FROM    --derived table
        ( SELECT     hsr3.AgentName ,
                     YEAR(hsr3.SoldDateTime) AS SoldYear ,
                     DATENAME(MM, hsr3.SoldDateTime) AS SoldMonthName ,
                      s3.SuburbName AS SoldSuburb ,
                 SoldPrice AS TotalSales
          FROM       Suburb3 s3
                     INNER JOIN HouseSoldRecord3 hsr3 ON s3.SuburbId = hsr3.HouseSoldSuburbID
        ) AS BaseData PIVOT
             ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable
ORDER BY AgentName ,
        SoldYear ,
        SoldMonthName;
GO -- Run the previous command and begins new batch
```



	AgentName	SoldYear	SoldMonthName	Suburb01	Suburb02	Suburb03
1	Name01	2015	April	470000.00	NULL	NULL
2	Name01	2015	November	NULL	NULL	499000.00
3	Name01	2016	April	NULL	400000.00	NULL
4	Name01	2016	December	390000.00	NULL	NULL
5	Name02	2015	September	NULL	350000.00	NULL
6	Name02	2016	August	NULL	350000.00	NULL
7	Name02	2016	June	NULL	NULL	440000.00
8	Name02	2016	November	NULL	399000.00	NULL
9	Name02	2017	April	500000.00	NULL	NULL
10	Name02	2017	March	330000.00	NULL	NULL
11	Name03	2015	August	NULL	489000.00	NULL
12	Name03	2015	February	475000.00	NULL	NULL
13	Name03	2015	July	NULL	NULL	430000.00
14	Name03	2015	June	520000.00	NULL	NULL
15	Name03	2015	September	560000.00	NULL	NULL
16	Name03	2016	April	NULL	NULL	460000.00
17	Name03	2016	January	NULL	440000.00	NULL
18	Name03	2016	July	NULL	NULL	320000.00
19	Name03	2017	April	NULL	450000.00	470000.00

```
------------------------------------
--T018_03_06_02
SELECT  AgentName ,
        SoldYear ,
        SoldMonthName ,
        Suburb01 ,
        Suburb02 ,
        Suburb03
FROM    --derived table
        ( SELECT    hsr3.AgentName ,
                    YEAR(hsr3.SoldDateTime) AS SoldYear ,
                    DATEPART(MONTH, SoldDateTime) AS SoldMonth ,
                    DATENAME(MM, hsr3.SoldDateTime) AS SoldMonthName ,
                     s3.SuburbName AS SoldSuburb ,
                     SoldPrice AS TotalSales
          FROM       Suburb3 s3
                     INNER JOIN HouseSoldRecord3 hsr3 ON s3.SuburbId = hsr3.HouseSoldSuburbID
        ) AS BaseData PIVOT
             ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable
ORDER BY AgentName ,
        SoldYear ,
        SoldMonth;
GO -- Run the previous command and begins new batch
```


	AgentName	SoldYear	SoldMonthName	Suburb01	Suburb02	Suburb03
1	Name01	2015	April	470000.00	NULL	NULL
2	Name01	2015	November	NULL	NULL	499000.00
3	Name01	2016	April	NULL	400000.00	NULL
4	Name01	2016	December	390000.00	NULL	NULL
5	Name02	2015	September	NULL	350000.00	NULL
6	Name02	2016	June	NULL	NULL	440000.00
7	Name02	2016	August	NULL	350000.00	NULL
8	Name02	2016	November	NULL	399000.00	NULL
9	Name02	2017	March	330000.00	NULL	NULL
10	Name02	2017	April	500000.00	NULL	NULL
11	Name03	2015	February	475000.00	NULL	NULL
12	Name03	2015	June	520000.00	NULL	NULL
13	Name03	2015	July	NULL	NULL	430000.00
14	Name03	2015	August	NULL	489000.00	NULL
15	Name03	2015	September	560000.00	NULL	NULL
16	Name03	2016	January	NULL	440000.00	NULL
17	Name03	2016	April	NULL	NULL	460000.00
18	Name03	2016	July	NULL	NULL	320000.00
19	Name03	2017	April	NULL	450000.00	470000.00

```
/*
1.
Pivot Syntax2
Reference:
https://technet.microsoft.com/en-us/library/ms177410(v=sql.105).aspx
If you don't want to display all pivoted columns in left hand side.
Then you cannot use "SELECT *",
you have to use "SELECT T1C1, T1C2, ..." in outter query.
--SELECT  T1C1, T1C2, ...T1Cn-3, T1Cn-1V1, T1Cn-1V2, T1Cn-1V3
---- You hide T1Cn-2 pivoted column, but You still can ORDER BY T1Cn-2.
--FROM    --derived table
--        ( SELECT    T1C1 , --1st pivoted column
--                    T1C2 , --2nd pivoted column
--                    ....
--                    T1Cn-3 , --N-3 th pivoted column
--                    T1Cn-2 , --N-2 th pivoted column which you don't want to display.
--                    T1Cn-1 , --Column n-1 that contains the values that will become column headers
--                    T1Cn AS T1CnAliasName --Column n that used for aggregation function
--          FROM      T1
--       ) AS BaseData PIVOT
--       ( SUM(T1CnAliasName) FOR T1Cn-2 IN ( T1Cn-1V1, T1Cn-1V2, T1Cn-1V3 ) ) AS PivotTable;
--ORDER BY T1C1, T1C2, ... , T1Cn-2
--GO -- Run the previous command and begins new batch
T stand for Table
C stand for column
V stand for Value
T1C1, T1C2, ... , T1Cn-3 will become the pivoted columns in left hand side.
You hide T1Cn-2 pivoted column, but You still can ORDER BY T1Cn-2.
Column n-1,T1Cn-1, that contains the values that will become column headers.
Column n,T1Cn, that used for aggregation function.
Using "ORDER BY T1Cn-1V1, T1Cn-1V2, T1Cn-1V3, T1Cn" might cause some logic error that we don't expect.
Better just use "ORDER BY T1C1, T1C2, ... , T1Cn-2".
---------------------------
1.1.
E.g.
```

```
--SELECT  AgentName ,
--        SoldYear ,
--        SoldMonthName ,
--        Suburb01 ,
--        Suburb02 ,
--        Suburb03
--FROM    --derived table
--        ( SELECT    hsr3.AgentName ,
--                    YEAR(hsr3.SoldDateTime) AS SoldYear ,
--                               DATEPART(MONTH, SoldDateTime) AS SoldMonth ,
--                    DATENAME(MM, hsr3.SoldDateTime) AS SoldMonthName ,
--                    s3.SuburbName AS SoldSuburb ,
--                    SoldPrice AS TotalSales
--          FROM      Suburb3 s3
--                    INNER JOIN HouseSoldRecord3 hsr3 ON s3.SuburbId = hsr3.HouseSoldSuburbID
--        ) AS BaseData PIVOT
--           ( SUM(TotalSales) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable
--ORDER BY AgentName ,
--        SoldYear ,
--        SoldMonth;
--GO -- Run the previous command and begins new batch
1.1.1.
AgentName, SoldYear, SoldMonthName will become the pivoted columns in left hand side.
Column SoldSuburb that contains the values that will become column headers, Suburb01, Suburb02, Suburb03.
Column SoldPrice that used for aggregation function.
Using "ORDER BY Suburb01, Suburb02, Suburb03, SoldSuburb" might cause some logic error that we don't
expect.
Better just use "AgentName, SoldYear, SoldMonth".
1.1.2.
If using "ORDER BY AgentName , SoldYear, SoldMonthName"
SoldMonthName will become the alphabet order.
E.g. "April", "December", "July", "June" ,"November" ...etc.
This is not what we want,
we want the order by SoldMonth number but display SoldMonthName
E.g. "April", ... , "June", "July",..., "November" ,"December"
Thus, inner derived table SELECT both  SoldMonth and SoldMonthName.
But outer pivot table only SELECT SoldMonthName.
In addition, we still can ORDER BY SoldMonth.
*/
```

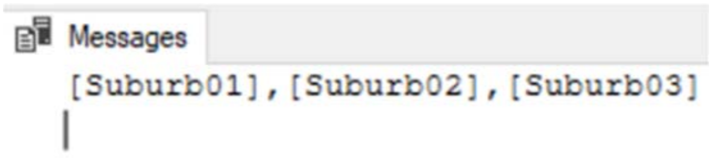
3.7. dynamic sql query

```
--==================================================================
--T018_03_07
--HouseSoldRecord3 Table
--dynamic sql query
```

3.7.1. fnGetAllSuburb

```
--------------------------------------------------------------------------------
--T018_03_07_01
--If function exists then DROP it
IF ( EXISTS ( SELECT    *
              FROM      INFORMATION_SCHEMA.ROUTINES
              WHERE     ROUTINE_TYPE = 'FUNCTION'
                        AND LEFT(ROUTINE_NAME, 2) NOT IN ( '@@' )
                        AND SPECIFIC_NAME = 'fnGetAllSuburb' ) )
    BEGIN
        DROP FUNCTION fnGetAllSuburb;
    END;
GO -- Run the previous command and begins new batch
CREATE FUNCTION fnGetAllSuburb ( )
RETURNS NVARCHAR(MAX)
AS
    BEGIN
```

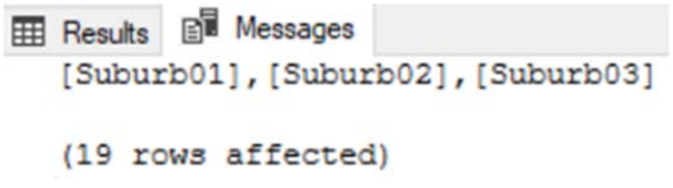
```
        DECLARE @AllSuburbName NVARCHAR(MAX) = '';
        SELECT  @AllSuburbName += ',' + QUOTENAME(SuburbName)
             -- QUOTENAME(SuburbName, '[]')
             -- QUOTENAME(SuburbName, '()')
             -- QUOTENAME(SuburbName, '''')
        FROM    dbo.Suburb3
        ORDER BY SuburbName;
             --E.g. ,[Suburb01],[Suburb02],[Suburb03]
             --Thus, need to get rid of first ','
        SET @AllSuburbName = SUBSTRING(@AllSuburbName, 2,
                                   LEN(@AllSuburbName) - 1);
        RETURN  @AllSuburbName;
    END;
GO -- Run the previous command and begins new batch
PRINT dbo.fnGetAllSuburb()
GO -- Run the previous command and begins new batch
```



```
[Suburb01],[Suburb02],[Suburb03]
```

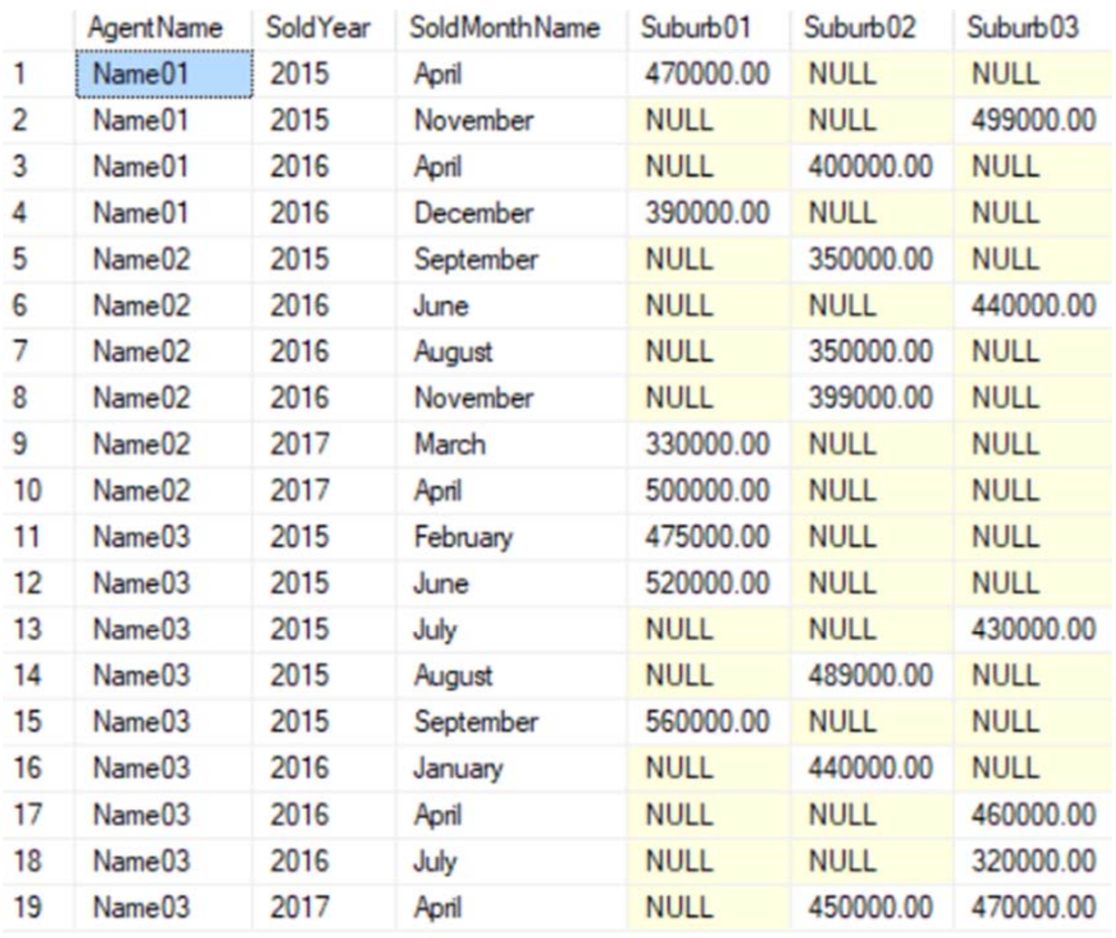
3.7.2. sp_executesql

```
----------------------------------------------------------------------------
--T018_03_07_02
DECLARE @AllSuburbName NVARCHAR(MAX) = dbo.fnGetAllSuburb();
PRINT @AllSuburbName;
DECLARE @Sql NVARCHAR(MAX) = '
SELECT  AgentName ,
        SoldYear ,
        SoldMonthName ,
        Suburb01 ,
        Suburb02 ,
        Suburb03
FROM    --derived table
        ( SELECT    hsr3.AgentName ,
                    YEAR(hsr3.SoldDateTime) AS SoldYear ,
                                DATEPART(MONTH, SoldDateTime) AS SoldMonth ,
                    DATENAME(MM, hsr3.SoldDateTime) AS SoldMonthName ,
                    s3.SuburbName AS SoldSuburb ,
                    SoldPrice AS TotalSales
          FROM      Suburb3 s3
                    INNER JOIN HouseSoldRecord3 hsr3 ON s3.SuburbId = hsr3.HouseSoldSuburbID
        ) AS BaseData PIVOT
             ( SUM(TotalSales) FOR SoldSuburb IN (' + @AllSuburbName
    + ') ) AS PivotTable
ORDER BY AgentName ,
        SoldYear ,
        SoldMonth;
';
EXEC sp_executesql @Sql;
GO -- Run the previous command and begins new batch
```



```
[Suburb01],[Suburb02],[Suburb03]

(19 rows affected)
```



	AgentName	SoldYear	SoldMonthName	Suburb01	Suburb02	Suburb03
1	Name01	2015	April	470000.00	NULL	NULL
2	Name01	2015	November	NULL	NULL	499000.00
3	Name01	2016	April	NULL	400000.00	NULL
4	Name01	2016	December	390000.00	NULL	NULL
5	Name02	2015	September	NULL	350000.00	NULL
6	Name02	2016	June	NULL	NULL	440000.00
7	Name02	2016	August	NULL	350000.00	NULL
8	Name02	2016	November	NULL	399000.00	NULL
9	Name02	2017	March	330000.00	NULL	NULL
10	Name02	2017	April	500000.00	NULL	NULL
11	Name03	2015	February	475000.00	NULL	NULL
12	Name03	2015	June	520000.00	NULL	NULL
13	Name03	2015	July	NULL	NULL	430000.00
14	Name03	2015	August	NULL	489000.00	NULL
15	Name03	2015	September	560000.00	NULL	NULL
16	Name03	2016	January	NULL	440000.00	NULL
17	Name03	2016	April	NULL	NULL	460000.00
18	Name03	2016	July	NULL	NULL	320000.00
19	Name03	2017	April	NULL	450000.00	470000.00

```
==================================================
```

4. Clean up

```
--=================================================================
--T018_04_Clean up
--=================================================================
--If Table exists then DROP it
IF ( EXISTS ( SELECT    *
             FROM      INFORMATION_SCHEMA.TABLES
             WHERE     TABLE_NAME = 'HouseSoldRecord1' ) )
   BEGIN
       TRUNCATE TABLE dbo.HouseSoldRecord1;
       DROP TABLE HouseSoldRecord1;
   END;
GO -- Run the previous command and begins new batch
IF ( EXISTS ( SELECT    *
             FROM      INFORMATION_SCHEMA.TABLES
             WHERE     TABLE_NAME = 'HouseSoldRecord2' ) )
   BEGIN
       TRUNCATE TABLE dbo.HouseSoldRecord2;
       DROP TABLE HouseSoldRecord2;
   END;
GO -- Run the previous command and begins new batch
IF ( EXISTS ( SELECT    *
             FROM      INFORMATION_SCHEMA.TABLES
             WHERE     TABLE_NAME = 'HouseSoldRecord3' ) )
   BEGIN
```

```
        TRUNCATE TABLE dbo.HouseSoldRecord3;
        DROP TABLE HouseSoldRecord3;
    END;
GO -- Run the previous command and begins new batch
IF ( EXISTS ( SELECT    *
              FROM      INFORMATION_SCHEMA.TABLES
              WHERE     TABLE_NAME = 'Suburb3' ) )
    BEGIN
        TRUNCATE TABLE dbo.Suburb3;
        DROP TABLE Suburb3;
    END;
GO -- Run the previous command and begins new batch
--If function exists then DROP it
IF ( EXISTS ( SELECT    *
              FROM      INFORMATION_SCHEMA.ROUTINES
              WHERE     ROUTINE_TYPE = 'FUNCTION'
                        AND LEFT(ROUTINE_NAME, 2) NOT IN ( '@@' )
                        AND SPECIFIC_NAME = 'fnGetAllSuburb' ) )
    BEGIN
        DROP FUNCTION fnGetAllSuburb;
    END;
GO -- Run the previous command and begins new batch
```

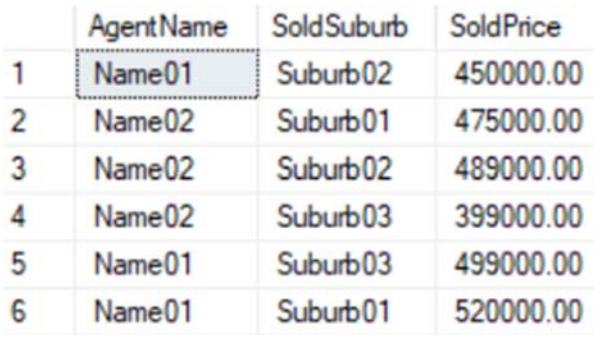
5. PIVOT_UNPIVOT : HouseSoldRecord4 Table

```
--==================================================================
--T018_05_PIVOT_UNPIVOT : HouseSoldRecord4 Table
--==================================================================
```

5.1. Create Sample Data

```
--==================================================================
--T018_05_01
--Create Sample Data
--There is no duplicate combination data of AgentName and SoldSuburb.
IF ( EXISTS ( SELECT    *
              FROM      INFORMATION_SCHEMA.TABLES
              WHERE     TABLE_NAME = 'HouseSoldRecord4' ) )
    BEGIN
        TRUNCATE TABLE dbo.HouseSoldRecord4;
        DROP TABLE HouseSoldRecord4;
    END;
GO -- Run the previous command and begins new batch
CREATE TABLE HouseSoldRecord4
    (
      AgentName NVARCHAR(100) ,
      SoldSuburb NVARCHAR(100) ,
      SoldPrice MONEY
    );
GO -- Run the previous command and begins new batch
INSERT  HouseSoldRecord4
VALUES  ( N'Name01', N'Suburb02', 450000 );
```

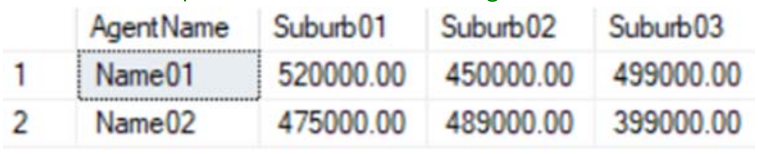
```
INSERT  HouseSoldRecord4
VALUES  ( N'Name02', N'Suburb01', 475000 );
INSERT  HouseSoldRecord4
VALUES  ( N'Name02', N'Suburb02', 489000 );
INSERT  HouseSoldRecord4
VALUES  ( N'Name02', N'Suburb03', 399000 );
INSERT  HouseSoldRecord4
VALUES  ( N'Name01', N'Suburb03', 499000 );
INSERT  HouseSoldRecord4
VALUES  ( N'Name01', N'Suburb01', 520000 );
GO -- Run the previous command and begins new batch
SELECT  *
FROM    HouseSoldRecord4;
GO -- Run the previous command and begins new batch
```



	AgentName	SoldSuburb	SoldPrice
1	Name01	Suburb02	450000.00
2	Name02	Suburb01	475000.00
3	Name02	Suburb02	489000.00
4	Name02	Suburb03	399000.00
5	Name01	Suburb03	499000.00
6	Name01	Suburb01	520000.00

5.2. Pivot need derived table

```
--=================================================================
--T018_05_02
--HouseSoldRecord4 Table
--vwHouseSoldRecord4Pivot1
--Pivot need derived table
--Delete View if exist
IF ( EXISTS ( SELECT    *
              FROM      INFORMATION_SCHEMA.TABLES
              WHERE     TABLE_NAME = 'vwHouseSoldRecord4Pivot1' ) )
    BEGIN
        DROP VIEW vwHouseSoldRecord4Pivot1;
    END;
GO -- Run the previous command and begins new batch
--Create view for HouseSoldRecord4 Povit Table
CREATE VIEW vwHouseSoldRecord4Pivot1
AS
    SELECT  AgentName ,
            Suburb01 ,
            Suburb02 ,
            Suburb03
    FROM    HouseSoldRecord4 PIVOT
( SUM(SoldPrice) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable;
GO -- Run the previous command and begins new batch
--See the View data
SELECT  *
FROM    vwHouseSoldRecord4Pivot1;
GO -- Run the previous command and begins new batch
```



	AgentName	Suburb01	Suburb02	Suburb03
1	Name01	520000.00	450000.00	499000.00
2	Name02	475000.00	489000.00	399000.00

```
/*
```

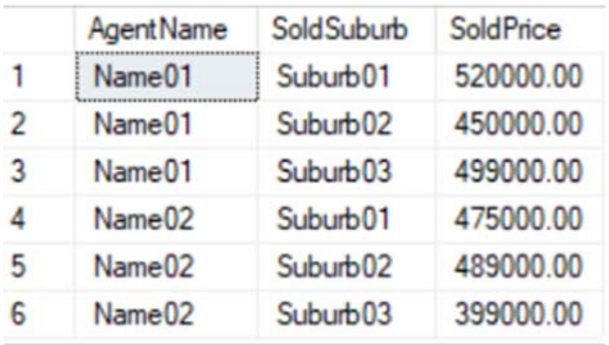
```
1.
Output as the following
--AgentName Suburb01   Suburb02   Suburb03
--Name01    520000.00  450000.00  499000.00
--Name02    475000.00  489000.00  399000.00
2.
Pivot need derived table
2.1.
The PIVOT query for HouseSoldRecord4 converts the unique column values (Suburb01, Suburb02, Suburb03)
in SoldSuburb column into Columns in the output,
along with performing aggregations on the SoldPrice column.
The Outer query, simply, selects AgentName column from HouseSoldRecord4 table,
along with pivoted columns from the PivotTable.
2.2.
In real world, Table should have any number of columns.
However,
HouseSoldRecord4 only has 3 columns, AgentName, SoldSuburb, and SoldPrice.
Not every table only has 3 columns.
There will be a 'logic error' if the table has more than 3 columns.
2.3.
In HouseSoldRecord4,
there is no duplicate combination data of AgentName and SoldSuburb.
Thus, SUM(SoldPrice) aggregations is actually not doing anything.
Hense, This vwHouseSoldRecord4Pivot1 is ok to UNPIVOT.
*/
```

5.3. The following clauses are equivalent

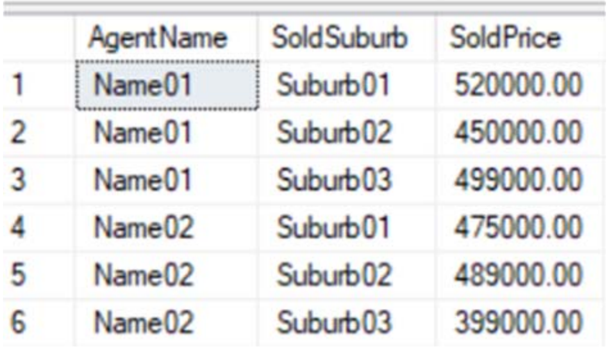
```
--=================================================================
--T018_05_03
--The following clauses are equivalent

----------------------------------------------------------------------------
--T018_05_03_01
--UNPIVOT vwHouseSoldRecord4Pivot1
SELECT AgentName, SoldSuburb, SoldPrice
FROM vwHouseSoldRecord4Pivot1
UNPIVOT
(
       SoldPrice
       FOR SoldSuburb IN (Suburb01, Suburb02 ,Suburb03)
) AS UnpivotExample
ORDER BY AgentName, SoldSuburb;
GO -- Run the previous command and begins new batch

----------------------------------------------------------------------------
--T018_05_03_02
--The orginal HouseSoldRecord4
SELECT  *
FROM    HouseSoldRecord4
ORDER BY AgentName, SoldSuburb;
GO -- Run the previous command and begins new batch
```



	AgentName	SoldSuburb	SoldPrice
1	Name01	Suburb01	520000.00
2	Name01	Suburb02	450000.00
3	Name01	Suburb03	499000.00
4	Name02	Suburb01	475000.00
5	Name02	Suburb02	489000.00
6	Name02	Suburb03	399000.00



	AgentName	SoldSuburb	SoldPrice
1	Name01	Suburb01	520000.00
2	Name01	Suburb02	450000.00
3	Name01	Suburb03	499000.00
4	Name02	Suburb01	475000.00
5	Name02	Suburb02	489000.00
6	Name02	Suburb03	399000.00

==

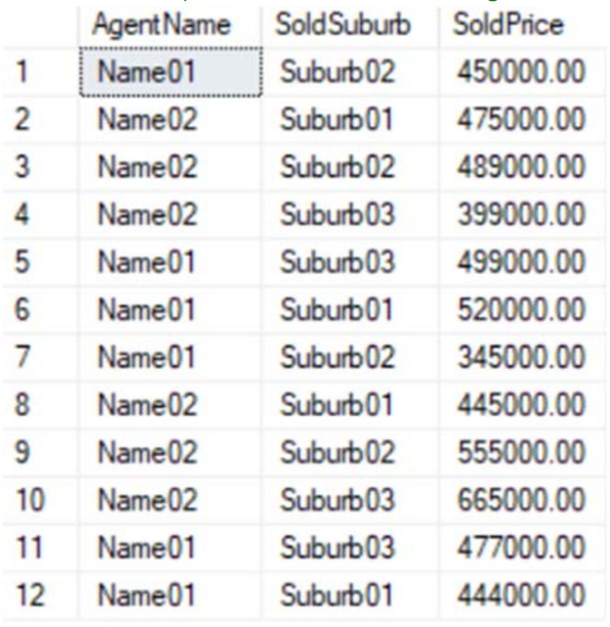
6. PIVOT_UNPIVOT : HouseSoldRecord5 Table

```
--==================================================================
--T018_06_PIVOT_UNPIVOT : HouseSoldRecord5 Table
--==================================================================
```

6.1. Create Sample Data

```
--==================================================================
--T018_06_01
--Create Sample Data
--There are some duplicate combination data of AgentName and SoldSuburb.
IF ( EXISTS ( SELECT    *
              FROM      INFORMATION_SCHEMA.TABLES
              WHERE     TABLE_NAME = 'HouseSoldRecord5' ) )
    BEGIN
        TRUNCATE TABLE dbo.HouseSoldRecord5;
        DROP TABLE HouseSoldRecord5;
    END;
GO -- Run the previous command and begins new batch
CREATE TABLE HouseSoldRecord5
    (
      AgentName NVARCHAR(100) ,
      SoldSuburb NVARCHAR(100) ,
      SoldPrice MONEY
    );
GO -- Run the previous command and begins new batch
INSERT  HouseSoldRecord5
VALUES  ( N'Name01', N'Suburb02', 450000 );
INSERT  HouseSoldRecord5
VALUES  ( N'Name02', N'Suburb01', 475000 );
INSERT  HouseSoldRecord5
VALUES  ( N'Name02', N'Suburb02', 489000 );
INSERT  HouseSoldRecord5
VALUES  ( N'Name02', N'Suburb03', 399000 );
```

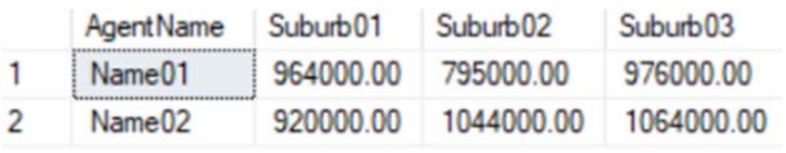
```
INSERT  HouseSoldRecord5
VALUES  ( N'Name01', N'Suburb03', 499000 );
INSERT  HouseSoldRecord5
VALUES  ( N'Name01', N'Suburb01', 520000 );
INSERT  HouseSoldRecord5
VALUES  ( N'Name01', N'Suburb02', 345000 );
INSERT  HouseSoldRecord5
VALUES  ( N'Name02', N'Suburb01', 445000 );
INSERT  HouseSoldRecord5
VALUES  ( N'Name02', N'Suburb02', 555000 );
INSERT  HouseSoldRecord5
VALUES  ( N'Name02', N'Suburb03', 665000 );
INSERT  HouseSoldRecord5
VALUES  ( N'Name01', N'Suburb03', 477000 );
INSERT  HouseSoldRecord5
VALUES  ( N'Name01', N'Suburb01', 444000 );
GO -- Run the previous command and begins new batch
SELECT  *
FROM    HouseSoldRecord5;
GO -- Run the previous command and begins new batch
```



	AgentName	SoldSuburb	SoldPrice
1	Name01	Suburb02	450000.00
2	Name02	Suburb01	475000.00
3	Name02	Suburb02	489000.00
4	Name02	Suburb03	399000.00
5	Name01	Suburb03	499000.00
6	Name01	Suburb01	520000.00
7	Name01	Suburb02	345000.00
8	Name02	Suburb01	445000.00
9	Name02	Suburb02	555000.00
10	Name02	Suburb03	665000.00
11	Name01	Suburb03	477000.00
12	Name01	Suburb01	444000.00

6.2. Pivot need derived table

```
--=================================================================
--T018_06_02
--HouseSoldRecord5 Table
--vwHouseSoldRecord5Pivot1
--Pivot need derived table
--Delete View if exist
IF ( EXISTS ( SELECT    *
              FROM      INFORMATION_SCHEMA.TABLES
              WHERE     TABLE_NAME = 'vwHouseSoldRecord5Pivot1' ) )
    BEGIN
        DROP VIEW vwHouseSoldRecord5Pivot1;
    END;
GO -- Run the previous command and begins new batch
--Create view for HouseSoldRecord5 Povit Table
CREATE VIEW vwHouseSoldRecord5Pivot1
AS
    SELECT  AgentName ,
            Suburb01 ,
            Suburb02 ,
            Suburb03
    FROM     HouseSoldRecord5 PIVOT
( SUM(SoldPrice) FOR SoldSuburb IN ( Suburb01, Suburb02, Suburb03 ) ) AS PivotTable;
GO -- Run the previous command and begins new batch
--See the View data
SELECT  *
FROM     vwHouseSoldRecord5Pivot1;
GO -- Run the previous command and begins new batch
```

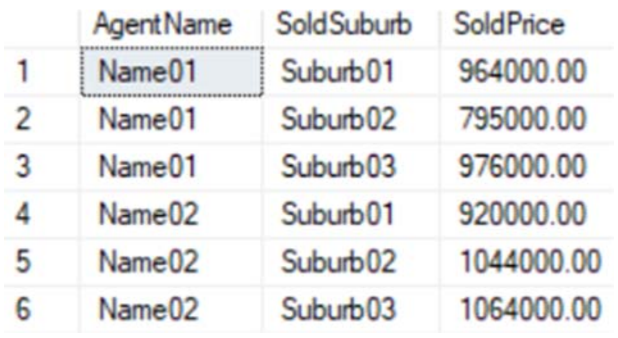


	AgentName	Suburb01	Suburb02	Suburb03
1	Name01	964000.00	795000.00	976000.00
2	Name02	920000.00	1044000.00	1064000.00

```
/*
1.
Output as the following
--AgentName Suburb01   Suburb02   Suburb03
--Name01    964000.00  795000.00  976000.00
--Name02    920000.00  1044000.00 1064000.00
2.
Pivot need derived table
2.1.
The PIVOT query for HouseSoldRecord5 converts the unique column values (Suburb01, Suburb02, Suburb03)
in SoldSuburb column into Columns in the output,
along with performing aggregations on the SoldPrice column.
The Outer query, simply, selects AgentName column from HouseSoldRecord5 table,
along with pivoted columns from the PivotTable.
2.2.
In real world, Table should have any number of columns.
However,
HouseSoldRecord5 only has 3 columns, AgentName, SoldSuburb, and SoldPrice.
Not every table only has 3 columns.
There will be a 'logic error' if the table has more than 3 columns.
2.3.
In HouseSoldRecord5,
there are some duplicate combination data of AgentName and SoldSuburb.
Thus, SUM(SoldPrice) aggregations is actually doing anything.
Hense, This vwHouseSoldRecord5Pivot1 is NOT ok to UNPIVOT.
*/
```

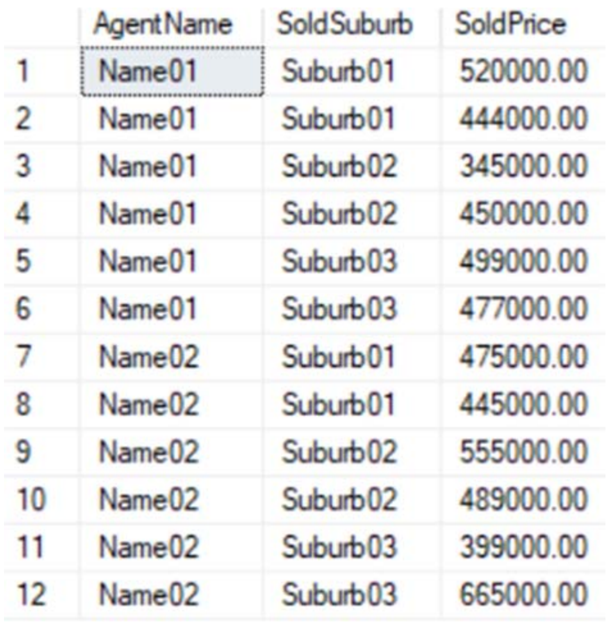
6.3. The following clauses are NOT equivalent

```
--==================================================================
--T018_06_03
--The following clauses are NOT equivalent
--T018_06_03_01
--UNPIVOT vwHouseSoldRecord5Pivot1
SELECT AgentName, SoldSuburb, SoldPrice
FROM vwHouseSoldRecord5Pivot1
UNPIVOT
(
       SoldPrice
       FOR SoldSuburb IN (Suburb01, Suburb02 ,Suburb03)
) AS UnpivotExample
ORDER BY AgentName, SoldSuburb;
GO -- Run the previous command and begins new batch
```



	AgentName	SoldSuburb	SoldPrice
1	Name01	Suburb01	964000.00
2	Name01	Suburb02	795000.00
3	Name01	Suburb03	976000.00
4	Name02	Suburb01	920000.00
5	Name02	Suburb02	1044000.00
6	Name02	Suburb03	1064000.00

```
-----------------------------------------------------
--T018_06_03_02
--The orginal HouseSoldRecord5
SELECT  *
FROM    HouseSoldRecord5
ORDER BY AgentName, SoldSuburb;
GO -- Run the previous command and begins new batch
/*
If the PIVOT operator has not aggregated the data,
you can get your original data back using the UNPIVOT operator
but If the PIVOT operator has aggregated the data,
then you can NOT use UNPIVOT operator.
*/
```



	AgentName	SoldSuburb	SoldPrice
1	Name01	Suburb01	520000.00
2	Name01	Suburb01	444000.00
3	Name01	Suburb02	345000.00
4	Name01	Suburb02	450000.00
5	Name01	Suburb03	499000.00
6	Name01	Suburb03	477000.00
7	Name02	Suburb01	475000.00
8	Name02	Suburb01	445000.00
9	Name02	Suburb02	555000.00
10	Name02	Suburb02	489000.00
11	Name02	Suburb03	399000.00
12	Name02	Suburb03	665000.00

==

7. Clean up

```
--=================================================================
--T018_07_Clean up
--=================================================================
IF ( EXISTS ( SELECT    *
             FROM      INFORMATION_SCHEMA.TABLES
             WHERE     TABLE_NAME = 'HouseSoldRecord4' ) )
    BEGIN
        TRUNCATE TABLE dbo.HouseSoldRecord4;
        DROP TABLE HouseSoldRecord4;
    END;
GO -- Run the previous command and begins new batch
```

```sql
IF ( EXISTS ( SELECT    *
              FROM      INFORMATION_SCHEMA.TABLES
              WHERE     TABLE_NAME = 'HouseSoldRecord5' ) )
    BEGIN
        TRUNCATE TABLE dbo.HouseSoldRecord5;
        DROP TABLE HouseSoldRecord5;
    END;
GO -- Run the previous command and begins new batch
--Delete View if exist
IF ( EXISTS ( SELECT    *
              FROM      INFORMATION_SCHEMA.TABLES
              WHERE     TABLE_NAME = 'vwHouseSoldRecord4Pivot1' ) )
    BEGIN
        DROP VIEW vwHouseSoldRecord4Pivot1;
    END;
GO -- Run the previous command and begins new batch
IF ( EXISTS ( SELECT    *
              FROM      INFORMATION_SCHEMA.TABLES
              WHERE     TABLE_NAME = 'vwHouseSoldRecord5Pivot1' ) )
    BEGIN
        DROP VIEW vwHouseSoldRecord5Pivot1;
    END;
GO -- Run the previous command and begins new batch
```