

Aggregating Data Using PIVOT and UNPIVOT



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Overview



Pivoting data in a spreadsheet

Cross tabulation before PIVOT

Building a cross tab query

Syntax of the PIVOT clause

Cross tabulation using PIVOT

Multi-pivoting

Dynamic pivoting

UNPIVOT

CROSS APPLY



Demo 1



Pivoting data in a spreadsheet



Pivoting in a Spreadsheet



Anyone can do it



But, anyone can do it! (Imagine hundreds of users)



Everyone needs access to the database



Performance can take a hit



Moving pivoting to the database leverages its power and security while providing consistent output



Demo 2



Before PIVOT:

- Building a cross tabulation query



```
SELECT <non-pivoted columns>,
       <pivot column 1> AS <column alias>,
       <pivot column 2> AS <column alias>,
       ...
       <pivot column n> AS <column alias>

FROM
    <table source>
    AS <query alias>

PIVOT (
    <aggregate function>(<pivot column>)

FOR
    <pivot values column>
        IN ( [<pivot column 1>],
              [<pivot column 2>],
              ...
              [<pivot column n>])
    ) AS <pivot alias>
<optional ORDER BY ...;
```

- ◀ Outer SELECT and non-pivoted columns
- ◀ Columns resulting from PIVOT with optional aliases
- ◀ FROM clause
- ◀ Source data (table | view | CTE | subquery)
- ◀ PIVOT clause
- ◀ Aggregation function (SUM, AVG, MIN, ...)
- ◀ FOR subclause
- ◀ Column containing columns to pivot
- ◀ Columns to pivot
- ◀ Alias for the PIVOT clause
- ◀ Optional ORDER BY clause



Demo 3



Cross Tabulation using PIVOT



Demo 4



PIVOTing on more than one column



Demo 5



Dynamic pivoting

Don't know the pivot values in advance

Build and execute dynamic SQL



Using UNPIVOT

Opposite of PIVOT

Not the reverse

Multiple UNPIVOTs
possible



```
SELECT <non-pivoted columns>,
       <pivoted column> AS <column alias>,
       <value column> AS <column alias>,

FROM
    <table source>
    AS <query alias>

UNPIVOT (
    <value column>

FOR
    <pivot values column>
        IN ( <pivot column 1>,
              <pivot column 2>,
              ...
              <pivot column n>)
) AS <unpivot alias>
<optional ORDER BY ...;
```

- ◀ Outer SELECT and non-pivoted columns
- ◀ Column for unpivoted column names
- ◀ Values for the unpivoted columns
- ◀ FROM clause
- ◀ Source data (table | view | CTE | subquery)
- ◀ UNPIVOT clause
- ◀ Column to hold value from UNPIVOT
- ◀ FOR subclause
- ◀ Pivoted column values
- ◀ Pivoted column names
- ◀ Alias for the UNPIVOT clause
- ◀ Optional ORDER BY clause



Demo 6



Using UNPIVOT



Summary



PIVOT and UNPIVOT clauses

PIVOT

- Crosstab
- Refactored to PIVOT
- Multi-pivot
- Dynamic pivoting

UNPIVOT

- Simple example
- UNPIVOT pivoted data
- Not complete reversal

CROSS APPLY

