* 1. **Script/Demo**



* 1. **FIRST\_VALUE, LAST\_VALUE, LAG and LEAD**

The function **FIRST\_VALUE()** returns the first value in a sorted data set as specified in the ORDER BY clause.

The function **LAST\_VALUE()** returns the last value in an ordered set. ***The default behavior constraints the window for which the last value is returned to the ORDER BY clause and does not consider the remaining rows in the partition. That's why to obtain the last value in the partition the ROWS BETWEEN UNBOUNDED PRECEDING AND UNBOUNDED FOLLOWING must be used.***

The function **LAG()** or **LAG( , offset)** returns the previous value.

The function **LEAD()** or **LEAD( , offset)** returns the previous value.

**SELECT**

**FIRST\_VALUE(p.StandardCost) OVER (PARTITION BY pc.Name ORDER BY ps.Name) AS FirstValue,**

**LAST\_VALUE(p.StandardCost) OVER (PARTITION BY pc.Name ORDER BY ps.Name ROWS BETWEEN UNBOUNDED PRECEDING AND UNBOUNDED FOLLOWING) AS LastValueInPartition,**

**LAST\_VALUE(p.StandardCost) OVER (PARTITION BY pc.Name ORDER BY ps.Name) AS LastValueInProductSubcatgory,**

**LAG(p.StandardCost) OVER (PARTITION BY pc.Name ORDER BY ps.Name) AS PreviousCost,**

**LAG(p.StandardCost, 2) OVER (PARTITION BY pc.Name ORDER BY ps.Name) AS PreviousCostOffset,**

**LEAD(p.StandardCost) OVER (PARTITION BY pc.Name ORDER BY ps.Name) AS NextCost,**

**LEAD(p.StandardCost, 2) OVER (PARTITION BY pc.Name ORDER BY ps.Name) AS NextCostOffset,**

**pc.Name AS ProductCategory,**

**ps.Name AS ProductSubcategory,**

**p.Name AS ProductName,**

**p.StandardCost**

**FROM**

**[Production].[Product] p**

**INNER JOIN [Production].[ProductSubcategory] ps**

**ON p.ProductSubcategoryID=ps.ProductSubcategoryID**

**INNER JOIN [Production].[ProductCategory] pc**

**ON pc.ProductCategoryID=ps.ProductCategoryID**

**ORDER BY pc.Name, ps.Name**

Machine generated alternative text:
FirstValue LastValuelnPartition LastValuelnProductSubcatgory PreviousCost PreviousCostOffset NeXICOst NextCostOffset ProductCategory ProductSubcategory ProductNarne StandardCost
44.88 1.8663 44.88 NULL NULL 59.466 1.8663 Accessories Bike Racks Hitch Rack -4-Bike 44.88
44.88 1.8663 59466 44.88 NULL 1.8663 3.7363 Accessories Bike Stands Au-Purpose Bike Stand 59.466
44.88 1.8663 L.:? . 59.466 44.88 3.7363 3.3623 Accessories Bottles and Cages Water Bottle -34) oz. 1.8663
44.88 1.8663 3.3623 1.8663 59.466 3.3623 2.9733 Accessories Bottles and Cages Mountain Bottle Cage 3.7363
44.88 1.8663 3.3623 3.7363 1.8663 2.9733 8.2205 Accessories Bottles and Cages Road Bottle Cage 3.3623
44.88 1.8663 2.9733 3.3623 3.7363 8.2205 13.0863 Accessories Cleaners Bike Wash - Dissolver 2.9733
44.88 1.8663 8.2205 2.9733 3.3623 13.0863 13.0863 Accessones Fenders Fender Set - Mountain 8.2205
44.88 1.8663 13.0863 8.2205 2.9733 13.0863 13.0863 Accessories Helmets Sport-100 Helmet. Red 13.0863
44.88 1.8663 13.0863 13.0863 8.2205 13.0863 20.5663 Accessories Helmets Sport-100 Helmet. Black 13.0863
44.88 1.8663 13.0863 13.0863 13.0863 20.5663 5.7709 Accessories Helmets Sport-100 Helmet, Blue 13.0863
44.88 1.8663 20.5663 13.0863 13.0863 5.7709 14.4334 Accessories Hydration Packs Hydration Pack -70 oz. 20.5663
¿ARR 1 R6ß3 1RSSR4 13f1R&3 144334 1RSSR4 Arr.pssnñps linhts TaiIlinhts-Ratteiv-Pnwerd 57709

* 1. **PERCENT\_RANK, CUME\_DIST**

**PERCENT\_RANK** and **CUM\_DIST** return relative position of a row in a group i.e. the calculate percentiles. PERCENT\_RANK is calculated using **(RANK – 1) / (N – 1)** and starts with 0. CUME\_DIST uses **RANK / N** and starts with a value greater than 0.

***PERCENT\_RANK equal to 0.1785 for cost equal to 2.9733 means that 17.85 % of rows has a cost less than 2.9733***

***CUME\_DIST equal to 0.2068 for cost equal to 2.9733 means that 20.68 % of rows has a cost less or equal to 2.9733***

SELECT

RANK() OVER (PARTITION BY pc.Name ORDER BY p.StandardCost) AS RankValue,

PERCENT\_RANK() OVER (PARTITION BY pc.Name ORDER BY p.StandardCost) AS PercentRankValueLessThen,

CUME\_DIST() OVER (PARTITION BY pc.Name ORDER BY p.StandardCost) AS CumeValueLessOrEqualThen,

pc.Name AS ProductCategory,

ps.Name AS ProductSubcategory,

p.Name AS ProductName,

p.StandardCost

FROM

[Production].[Product] p

INNER JOIN [Production].[ProductSubcategory] ps

ON p.ProductSubcategoryID=ps.ProductSubcategoryID

INNER JOIN [Production].[ProductCategory] pc

ON pc.ProductCategoryID=ps.ProductCategoryID

ORDER BY pc.Name, p.StandardCost

Machine generated alternative text:
RankVaiue PercentRankValueLessThen CumeValueLessOrEquaiThen ProductCategory ProductSubcategory ProductNarne StandardCost
1, 0 0.0344.827586206897 Accessories Tires and Tubes Patch Ñt/8 Patches 0.8565
2 0.0357142857142857 0.0689655172413793 Accessones Tires and Tubes Road Tire Tube 1.4923
3 0.0714285714285714 0.172413793103448 Accessories Tires and Tubes Touring Tire Tube 1.8663
3 0.0714285714285714 0.172413793103448 Accessories Tìres and Tubes Mountain lire Tube 1.8663
3 0.0714285714285714 0.172413793103448 Accessories Bottles and Cages Water Bottle -30 oz. 1.8663
6 0.178571428571429 0.206896551724138 Accessories Cleaners Bike Wash - Dissolver 2.9733
7 0.214285714285714 0.241379310344828 Accessories Bottles and Cages Road Bottle Cage 3.3623
0.25 0.275862068965517 Accessories Bottles and Cages Mountain Bottle Cage 3.7363
0.28571 4285714286 0.310344827586207 Accessories lights Taillights - Battery-Powered 5.7709
0.321428571428571 0.344.827586206897 Accessories Tires and Tubes LL Road Tire 8.0373
0.357142857142857 0.379310344827586 Accessories Fenders Fender Set - Mountain 8.2205

* 1. **PERCENTILE\_CONT, PERCENTILE\_DISC**

The two functions have a slight different syntax which is are follows:

* + **PERCENTILE\_DISC ( X ) WITHIN GROUP ( ORDER BY … ) OVER (PARTITION BY … )**
  + **PERCENTILE\_CONT ( X ) WITHIN GROUP ( ORDER BY … ) OVER (PARTITION BY … )**

These two functions return a value from the dataset which computes a specific percentile (divides the dataset / partition in a desired percentiles). E.g. for X = 0.5 the Median (50% percentile) will be calculated. The difference between those functions is that **PERCENTILE\_CONT** always calculates appropriate / exact value but the value does not have to be found in the dataset. The **PERCENTILE\_DISC** always returns the value from actual dataset.

**SELECT**

**RANK() OVER (PARTITION BY pc.Name ORDER BY p.StandardCost) AS RankValue,**

**PERCENTILE\_DISC (0.5) WITHIN GROUP (ORDER BY p.StandardCost) OVER (PARTITION BY pc.Name) AS MedianValue,**

**PERCENTILE\_CONT (0.5) WITHIN GROUP (ORDER BY p.StandardCost) OVER (PARTITION BY pc.Name) AS RealMedianValue,**

**PERCENTILE\_DISC (0.6) WITHIN GROUP (ORDER BY p.StandardCost) OVER (PARTITION BY pc.Name) AS [60QValue],**

**PERCENTILE\_CONT (0.6) WITHIN GROUP (ORDER BY p.StandardCost) OVER (PARTITION BY pc.Name) AS [Real60QValue],**

**pc.Name AS ProductCategory,**

**ps.Name AS ProductSubcategory,**

**p.Name AS ProductName,**

**p.StandardCost**

**FROM**

**[Production].[Product] p**

**INNER JOIN [Production].[ProductSubcategory] ps**

**ON p.ProductSubcategoryID=ps.ProductSubcategoryID**

**INNER JOIN [Production].[ProductCategory] pc**

**ON pc.ProductCategoryID=ps.ProductCategoryID**

**ORDER BY pc.Name, p.StandardCost**

Machine generated alternative text:
RankValue MedianValue RealMedianValue 600Value Real6OQValue ProductCategory ProductSubcategory ProductName StandardCost
7
10.3084
10.3084
11.2163
11.1415
Accessories
Botties and Cages
Road Bottle Cage
3.3623
8
10.3084
10.3084
11.2163
11.1415
Accessories
Bottles and Cages
Mountain Bottle Cage
3.7363
9
10.3084
10.3084
11.2163
11.1415
Accessofles
Lights
Taillights - Batteiy-Powered
5.7709
10
10.3084
10.3084
11.2163
11.1415
Accessories
lires and Tubes
LL Road lire
8.0373
11
10.3084
10.3084
11.2163
11.1415
Accessories
Fenders
FenderSet - Mountain
8.2205
12
10.3084
10.3084
11.2163
11.1415
Accessofles
Pumps
Minipump
8.2459
13
10.3084
10.3084
11.2163
11.1415
Accessories
liresandTubes
MLRoadlire
9.3463
13
10.3084
10.3084
11.2163
11.1415
Accessories
lires and Tubes
LL Mountain Tire
9.3463
15
10.3084
10.3084
11.2163
11.1415
Accessories
Pumps
Mountain Pump
10.3024
16
10.3084
10.3084
11.2163
11.1415
Accessories
Locks
Cable Lock
10.3125
17
10.3084
10.3084
11.2163
11.1415
Accessories
lires and Tubes
Touring lire
QTM 
18
10.3084
10.3084
11.2163
11.1415
Accessories
lires and Tubes
ML Mountain lire
i1.2 
19
10.3084
10.3084
11.2163
11.1415
Accessories
liresandTubes
HLRoadlire
12.1924