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Advanced Aggregates

Advanced Queries with Aggregates

Multiple Sources

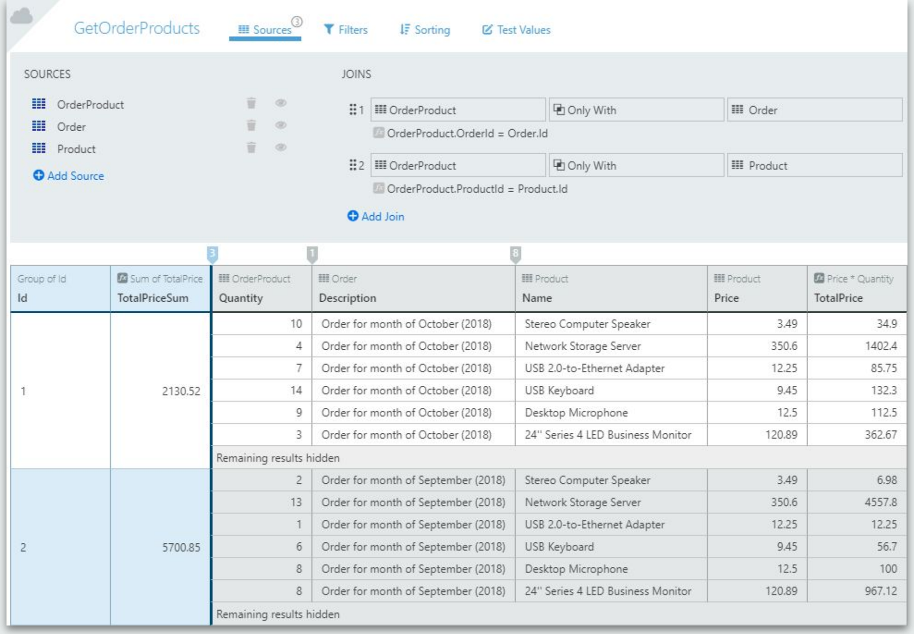
Calculated Attributes

Aggregating Records

What is an Aggregate?

An Aggregate is a **visual** element that allows you to define a **query to fetch data** from entities with sources, filters, and sorting.

Advanced Queries with Aggregates



SOURCES

- OrderProduct
- Order
- Product

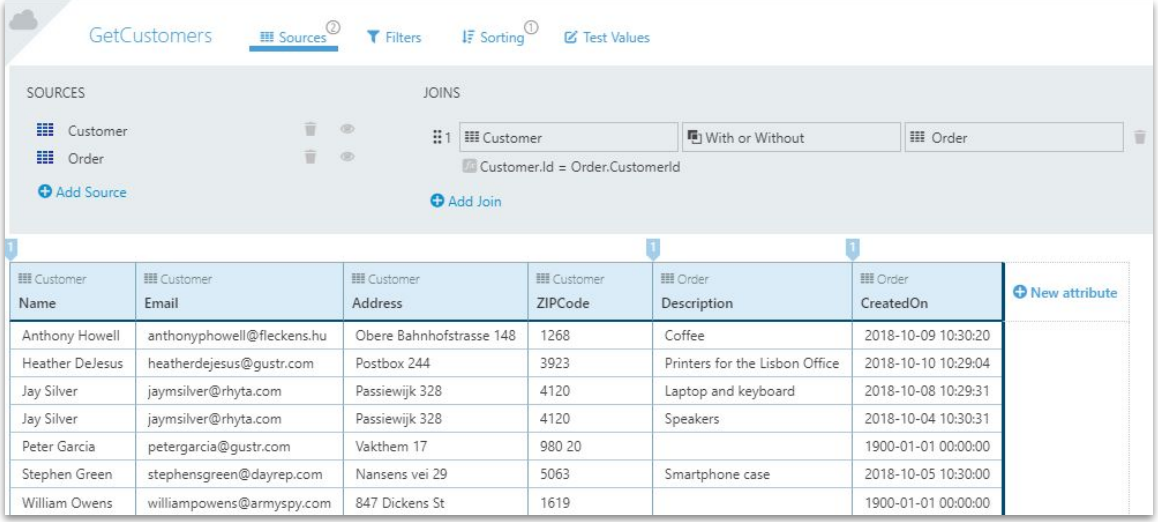
JOINS

1. OrderProduct | Only With | Order
   OrderProduct.OrderId = Order.Id
2. OrderProduct | Only With | Product
   OrderProduct.ProductId = Product.Id

Group of Id Id	Sum of TotalPrice TotalPriceSum	OrderProduct Quantity	Order Description	Product Name	Product Price	Price * Quantity TotalPrice
1	2130.52	10	Order for month of October (2018)	Stereo Computer Speaker	3.49	34.9
		4	Order for month of October (2018)	Network Storage Server	350.6	1402.4
		7	Order for month of October (2018)	USB 2.0-to-Ethernet Adapter	12.25	85.75
		14	Order for month of October (2018)	USB Keyboard	9.45	132.3
		9	Order for month of October (2018)	Desktop Microphone	12.5	112.5
		3	Order for month of October (2018)	24'' Series 4 LED Business Monitor	120.89	362.67
		Remaining results hidden				
2	5700.85	2	Order for month of September (2018)	Stereo Computer Speaker	3.49	6.98
		13	Order for month of September (2018)	Network Storage Server	350.6	4557.8
		1	Order for month of September (2018)	USB 2.0-to-Ethernet Adapter	12.25	12.25
		6	Order for month of September (2018)	USB Keyboard	9.45	56.7
		8	Order for month of September (2018)	Desktop Microphone	12.5	100
		8	Order for month of September (2018)	24'' Series 4 LED Business Monitor	120.89	967.12
		Remaining results hidden				

- Retrieving the correct data from the database can often be complex
- Aggregates have some advanced options that can easily be used
  - Multiple Sources
  - Calculated attributes
  - Aggregation functions

Multiple Sources



SOURCES

- Customer
- Order

Add Source

JOINS

1 Customer | With or Without | Order

Customer.Id = Order.CustomerId

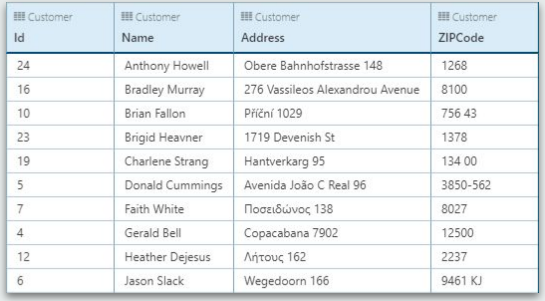
Add Join

Customer	Customer	Customer	Customer	Order	Order
Name	Email	Address	ZIPCode	Description	CreatedOn
Anthony Howell	anthonyphowell@fleckens.hu	Obere Bahnhofstrasse 148	1268	Coffee	2018-10-09 10:30:20
Heather DeJesus	heatherdejesus@gustr.com	Postbox 244	3923	Printers for the Lisbon Office	2018-10-10 10:29:04
Jay Silver	jaymsilver@rhyta.com	Passiewijk 328	4120	Laptop and keyboard	2018-10-08 10:29:31
Jay Silver	jaymsilver@rhyta.com	Passiewijk 328	4120	Speakers	2018-10-04 10:30:31
Peter Garcia	petergarcia@gustr.com	Vakthem 17	980 20		1900-01-01 00:00:00
Stephen Green	stephensgreen@dayrep.com	Nansens vei 29	5063	Smartphone case	2018-10-05 10:30:00
William Owens	williampowens@armyspy.com	847 Dickens St	1619		1900-01-01 00:00:00

- Aggregates can have **multiple Sources**
- OutSystems automatically creates the **Joins** when Entities have relationships

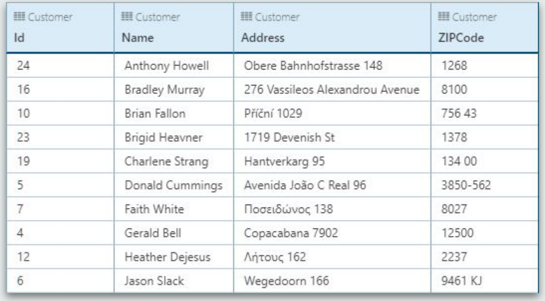
Join Examples

Customer



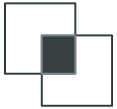
Customer	Customer	Customer	Customer
Id	Name	Address	ZIPCode
24	Anthony Howell	Obere Bahnhofstrasse 148	1268
16	Bradley Murray	276 Vassileos Alexandrou Avenue	8100
10	Brian Fallon	Příční 1029	756 43
23	Brigid Heavner	1719 Devenish St	1378
19	Charlene Strang	Hantverkarg 95	134 00
5	Donald Cummings	Avenida João C Real 96	3850-562
7	Faith White	Ποσειδώνος 138	8027
4	Gerald Bell	Copacabana 7902	12500
12	Heather Dejesus	Λήτους 162	2237
6	Jason Slack	Wegedoorn 166	9461 KJ

Order

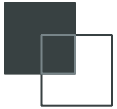


Customer	Customer	Customer	Customer
Id	Name	Address	ZIPCode
24	Anthony Howell	Obere Bahnhofstrasse 148	1268
16	Bradley Murray	276 Vassileos Alexandrou Avenue	8100
10	Brian Fallon	Příční 1029	756 43
23	Brigid Heavner	1719 Devenish St	1378
19	Charlene Strang	Hantverkarg 95	134 00
5	Donald Cummings	Avenida João C Real 96	3850-562
7	Faith White	Ποσειδώνος 138	8027
4	Gerald Bell	Copacabana 7902	12500
12	Heather Dejesus	Λήτους 162	2237
6	Jason Slack	Wegedoorn 166	9461 KJ

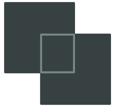
- Aggregates support three types of Joins



Only With

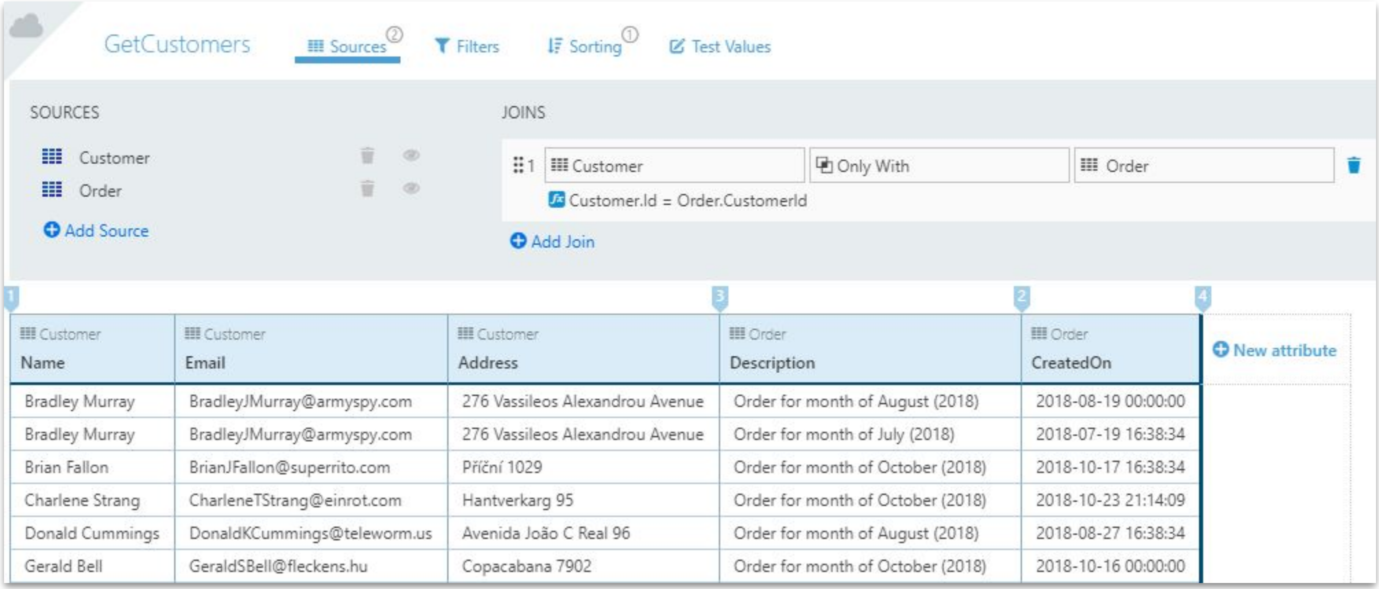


With or Without



With

Only With



SOURCES

- Customer
- Order

JOINS

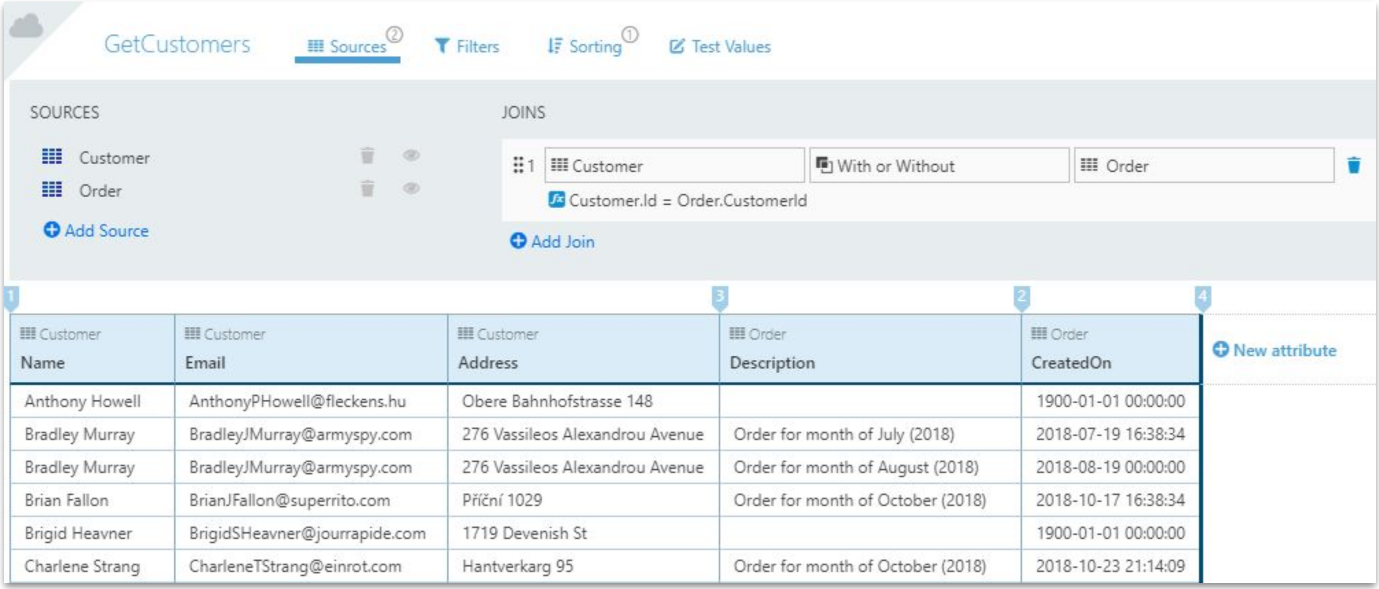
1 Customer | Only With | Order

Customer.Id = Order.CustomerId

Customer Name	Customer Email	Customer Address	Order Description	Order CreatedOn
Bradley Murray	BradleyJMurray@armyspy.com	276 Vassileos Alexandrou Avenue	Order for month of August (2018)	2018-08-19 00:00:00
Bradley Murray	BradleyJMurray@armyspy.com	276 Vassileos Alexandrou Avenue	Order for month of July (2018)	2018-07-19 16:38:34
Brian Fallon	BrianJFallon@superrito.com	Příční 1029	Order for month of October (2018)	2018-10-17 16:38:34
Charlene Strang	CharleneTStrang@einrot.com	Hantverkarg 95	Order for month of October (2018)	2018-10-23 21:14:09
Donald Cummings	DonaldKCummings@teleworm.us	Avenida João C Real 96	Order for month of August (2018)	2018-08-27 16:38:34
Gerald Bell	GeraldSBell@fleckens.hu	Copacabana 7902	Order for month of October (2018)	2018-10-16 00:00:00

- Returns only records where there is a match between Entities

With or Without



Sources: Customer, Order

Join 1: Customer | With or Without | Order

Customer.Id = Order.CustomerId

Customer	Customer	Customer	Order	Order
Name	Email	Address	Description	CreatedOn
Anthony Howell	AnthonyPHowell@fleckens.hu	Obere Bahnhofstrasse 148		1900-01-01 00:00:00
Bradley Murray	BradleyJMurray@armyspy.com	276 Vassileos Alexandrou Avenue	Order for month of July (2018)	2018-07-19 16:38:34
Bradley Murray	BradleyJMurray@armyspy.com	276 Vassileos Alexandrou Avenue	Order for month of August (2018)	2018-08-19 00:00:00
Brian Fallon	BrianJFallon@superrito.com	Příční 1029	Order for month of October (2018)	2018-10-17 16:38:34
Brigid Heavner	BrigidSHeavner@jourrapide.com	1719 Devenish St		1900-01-01 00:00:00
Charlene Strang	CharleneTStrang@einrot.com	Hantverkarg 95	Order for month of October (2018)	2018-10-23 21:14:09

- Returns all rows from the *left* Entity even if there is no match in the *right* Entity

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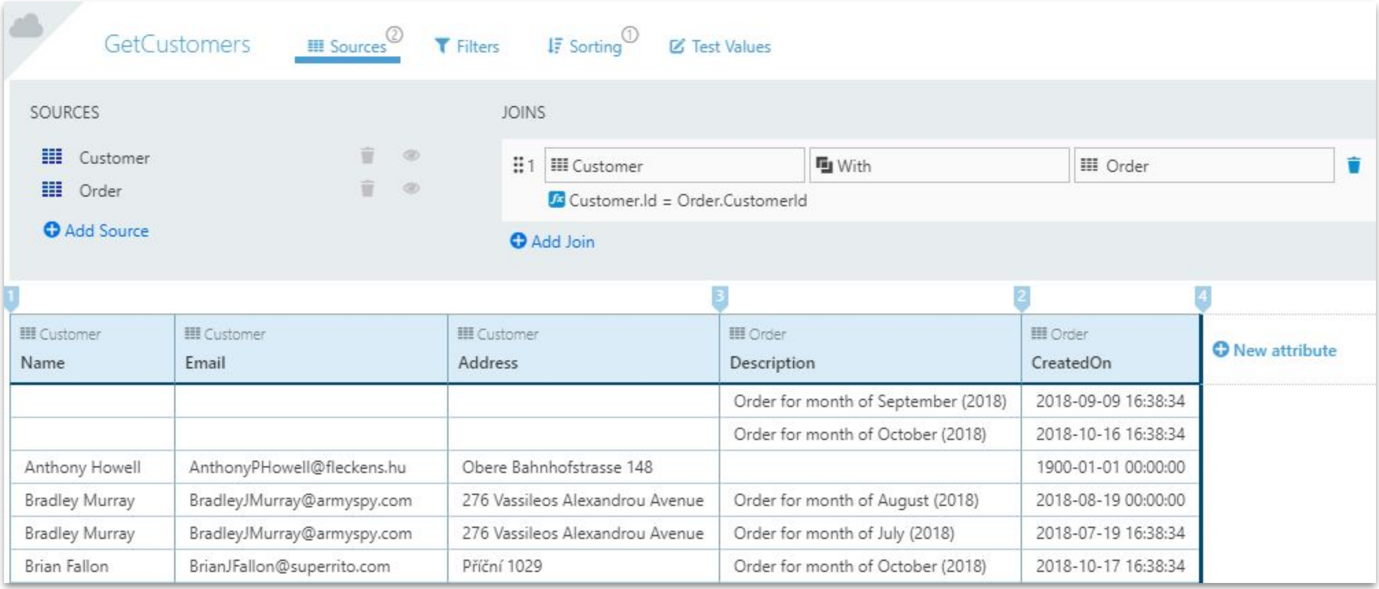
With



SOURCES

- Customer
- Order

JOINS

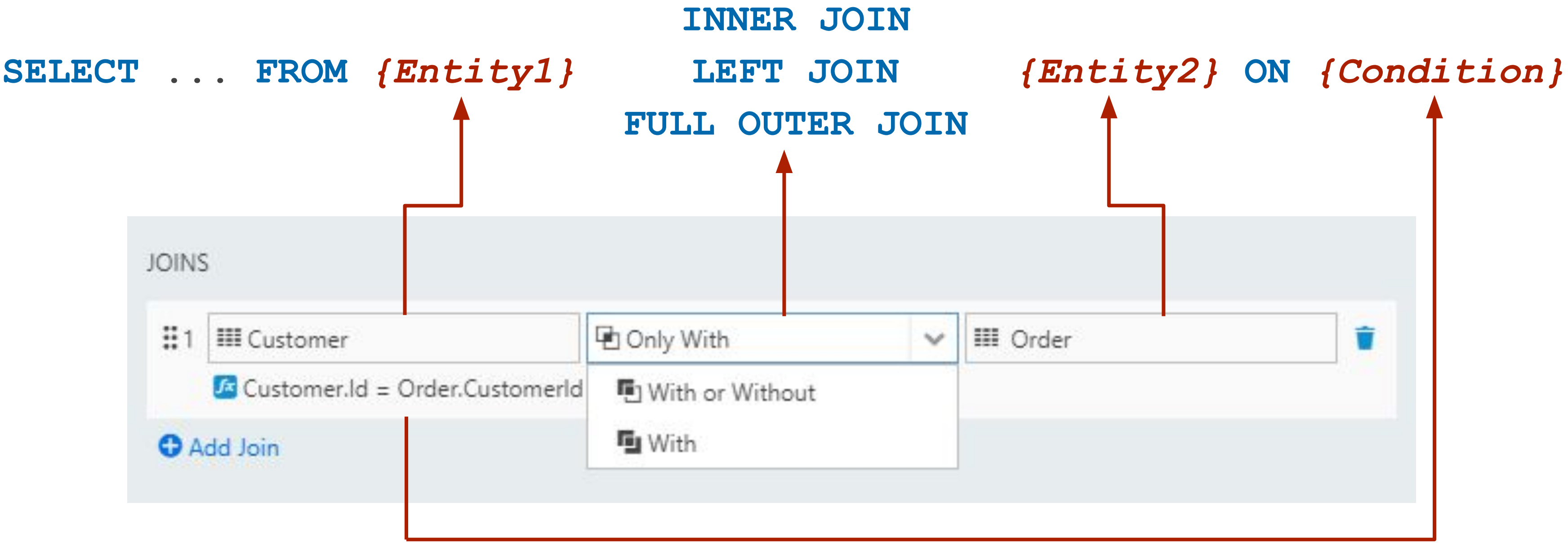
1 Customer With Order

Customer.Id = Order.CustomerId

Customer	Customer	Customer	Order	Order
Name	Email	Address	Description	CreatedOn
			Order for month of September (2018)	2018-09-09 16:38:34
			Order for month of October (2018)	2018-10-16 16:38:34
Anthony Howell	AnthonyPHowell@fleckens.hu	Obere Bahnhofstrasse 148		1900-01-01 00:00:00
Bradley Murray	BradleyJMurray@armyspy.com	276 Vassileos Alexandrou Avenue	Order for month of August (2018)	2018-08-19 00:00:00
Bradley Murray	BradleyJMurray@armyspy.com	276 Vassileos Alexandrou Avenue	Order for month of July (2018)	2018-07-19 16:38:34
Brian Fallon	BrianJFallon@superrito.com	Příční 1029	Order for month of October (2018)	2018-10-17 16:38:34

- Returns all rows from both Entities

Aggregate Joins in SQL



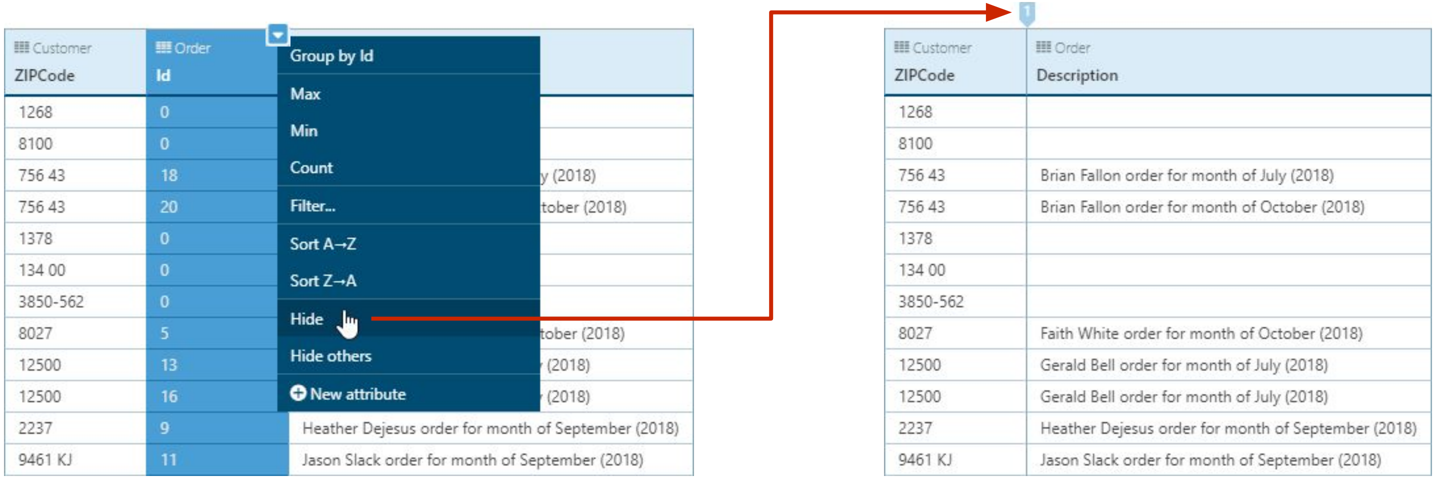
```
                                   INNER JOIN
SELECT ... FROM {Entity1}          LEFT JOIN         {Entity2} ON {Condition}
                                FULL OUTER JOIN
```

JOINS

1 Customer | Only With | Order

Customer.Id = Order.CustomerId

Hiding Columns

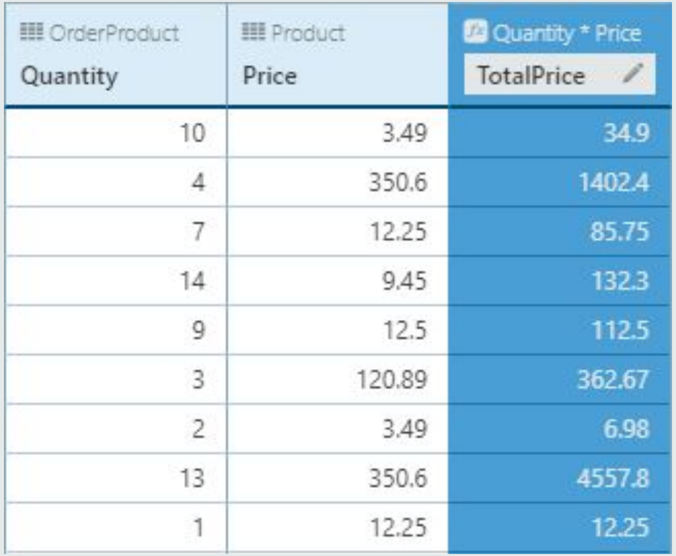


Customer ZIPCode	Order Id	
1268	0	
8100	0	
756 43	18	y (2018)
756 43	20	tober (2018)
1378	0	
134 00	0	
3850-562	0	
8027	5	tober (2018)
12500	13	(2018)
12500	16	(2018)
2237	9	Heather Dejesus order for month of September (2018)
9461 KJ	11	Jason Slack order for month of September (2018)

Customer ZIPCode	Order Description
1268	
8100	
756 43	Brian Fallon order for month of July (2018)
756 43	Brian Fallon order for month of October (2018)
1378	
134 00	
3850-562	
8027	Faith White order for month of October (2018)
12500	Gerald Bell order for month of July (2018)
12500	Gerald Bell order for month of July (2018)
2237	Heather Dejesus order for month of September (2018)
9461 KJ	Jason Slack order for month of September (2018)

- Hide columns for previewing purposes
    - Does not affect the Aggregate’s **output**
- The attributes used outside the Aggregate determine which columns are fetched

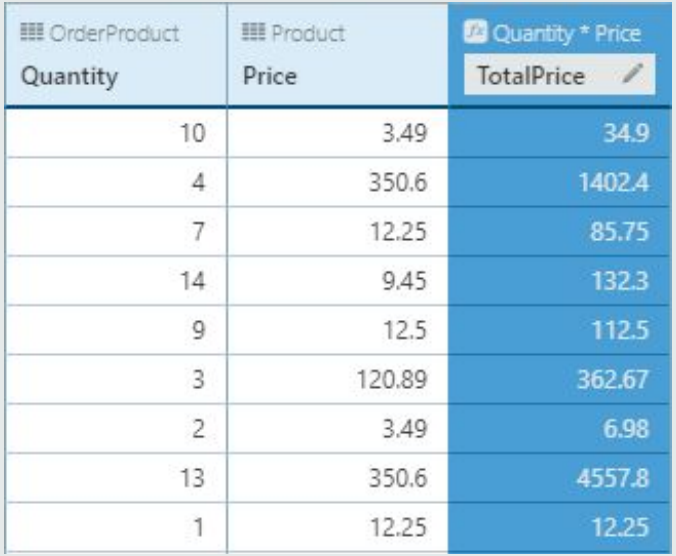
Calculated Attributes



OrderProduct	Product	Quantity * Price
Quantity	Price	TotalPrice
10	3.49	34.9
4	350.6	1402.4
7	12.25	85.75
14	9.45	132.3
9	12.5	112.5
3	120.89	362.67
2	3.49	6.98
13	350.6	4557.8
1	12.25	12.25

- Custom values computed from other attributes in the same Aggregate
- Become part of the query’s output
- Expression with access to
  - Source Entity attributes in the Aggregate
  - Built-in Functions
    - CurrDate(), DiffDays(), …
  - Variables

Calculated Attributes



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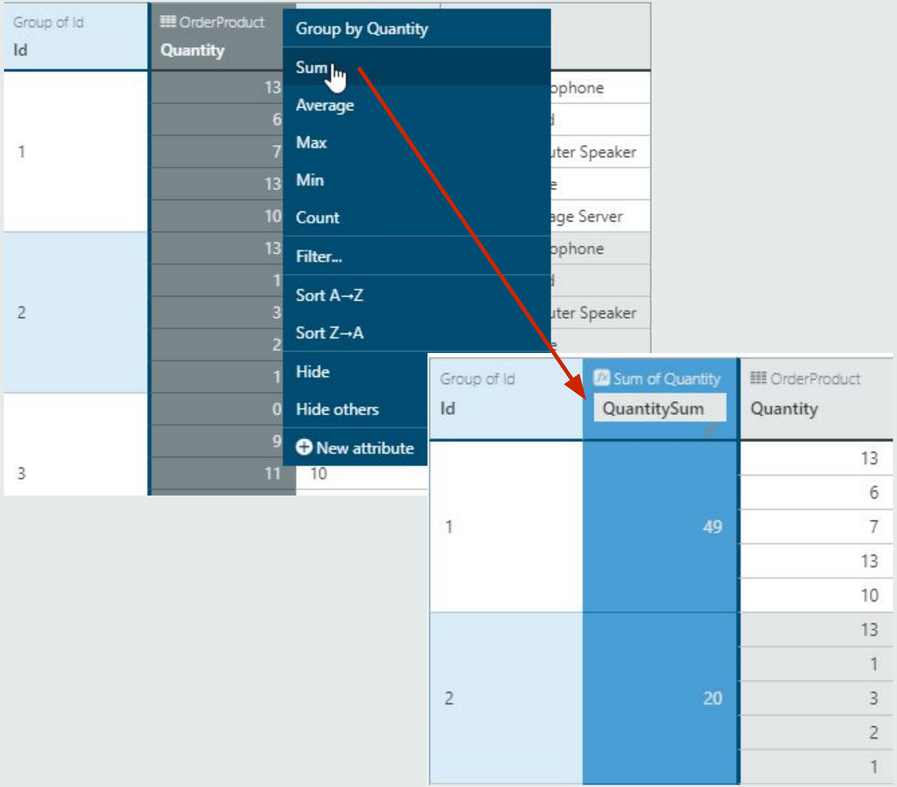
3	120.89	362.67
2	3.49	6.98
13	350.6	4557.8
1	12.25	12.25

- Custom values computed from other attributes in the same Aggregate
- Become part of the query’s output
- Expression with access to
    - Source Entity attributes in the Aggregate
    - Built-in Functions
        - CurrDate(), DiffDays(), …
    - Variables

Aggregating Records



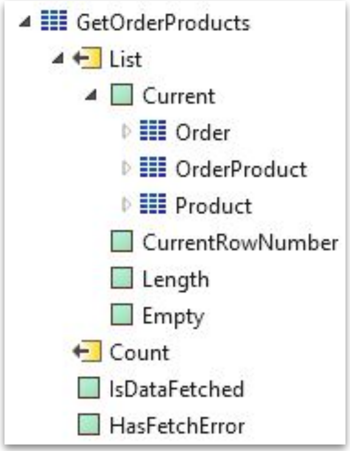
Group of Id Id	OrderProduct Quantity
1	13
	6
	7
	13
	10
2	13
	1
	3
	2
	1
3	0
	9
	11

Group of Id Id	Sum of Quantity QuantitySum	OrderProduct Quantity
1	49	13
		6
		7
		13
		10
2	20	13
		1
		3
		2
		1

- Group multiple rows together
  - Example: Group by Orders to find # of Products per Order
- Apply a function on a group of values
  - Sum
  - Average
  - Min
  - Max
  - Count
- Only the aggregated (blue) columns are part of the output

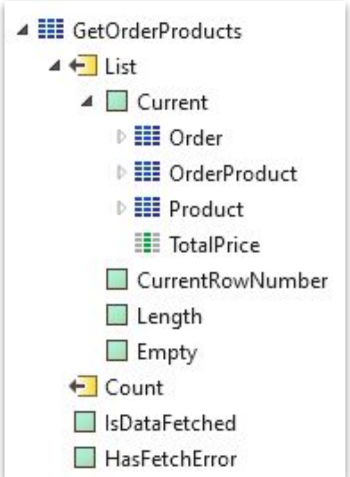
Aggregates Output (Revisited)

Multiple Sources



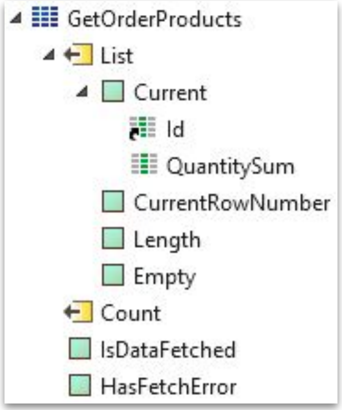
- GetOrderProducts
  - List
    - Current
      - Order
      - OrderProduct
      - Product
    - CurrentRowNumber
    - Length
    - Empty
  - Count
  - IsDataFetched
  - HasFetchError

Calculated Attributes



- GetOrderProducts
  - List
    - Current
      - Order
      - OrderProduct
      - Product
      - TotalPrice
    - CurrentRowNumber
    - Length
    - Empty
  - Count
  - IsDataFetched
  - HasFetchError

Aggregated Columns



- GetOrderProducts
  - List
    - Current
      - Id
      - QuantitySum
    - CurrentRowNumber
    - Length
    - Empty
  - Count
  - IsDataFetched
  - HasFetchError

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Questions?

Thank you

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