

Modeling Data for Analysis



Stacia Varga

PRINCIPAL CONSULTANT

@_StaciaV_ blog.datainspirations.com



Overview



Creating relationships

Defining new columns

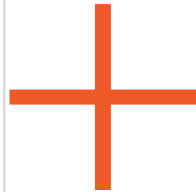
Adding a date table



Creating Relationships

Sales

BusinessEntityID	SalesAmount
1699	\$83.969999999999999
1700	\$41.259999999999998
1701	\$8,169
1702	\$3,150.3982000000001
1703	\$5,333.25
1704	\$2,994.0881999999997
1705	\$1,750.98
1706	\$64.469999999999999



Customer

BusinessEntityID	LastName	FirstName
1770	Adams	Ben
3731	Adams	Edward
3805	Adams	Wyatt
3889	Adams	Fernando
4034	Adams	Jeremy
4194	Adams	Blake
4350	Adams	Seth
4429	Adams	Xavier



Power BI Desktop



Can't display the visual. [See details](#)

Fix This



Creating Relationships

Sales

Row Labels	Sum of SalesAmount
1705	\$1,750.98
1709	\$68.97
1725	\$56.97
1739	\$61.96
1742	\$4.99
1744	\$4.99
1756	\$4,456.14
1757	\$2,071.42
1761	\$25.48
1769	\$3,578.27



Customer

BusinessEntityID	LastName	FirstName
1705	Rothenberg	Eric
1709	Roy	Luke
1725	Sanchez	Thomas
1739	Seamans	Mike
1742	Selikoff	Steven
1744	Several	Joshua
1756	Simpson	Marty
1757	Simpson	David
1761	Skelly	Bonnie
1769	Smith	Rolando



Excel

BusinessEntityID	LastName	FirstName	Sum of SalesAmount
1705	Rothenberg	Eric	\$9,352,497.57
1709	Roy	Luke	\$9,352,497.57
1725	Sanchez	Thomas	\$9,352,497.57
1739	Seamans	Mike	\$9,352,497.57
1742	Selikoff	Steven	\$9,352,497.57
1744	Several	Joshua	\$9,352,497.57
1756	Simpson	Marty	\$9,352,497.57
1757	Simpson	David	\$9,352,497.57
1761	Skelly	Bonnie	\$9,352,497.57
1769	Smith	Rolando	\$9,352,497.57

Relationships between tables may be needed.

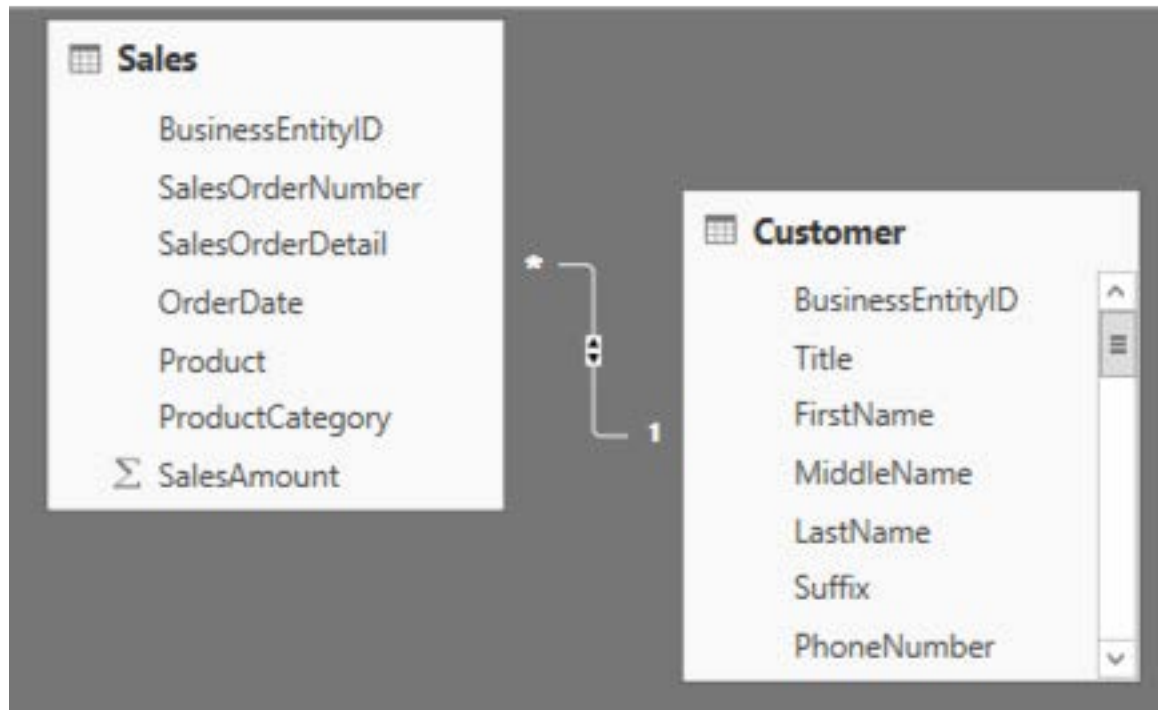
Auto-Detect...

CREATE...



Creating Relationships

Relationship diagram



Columns from related tables

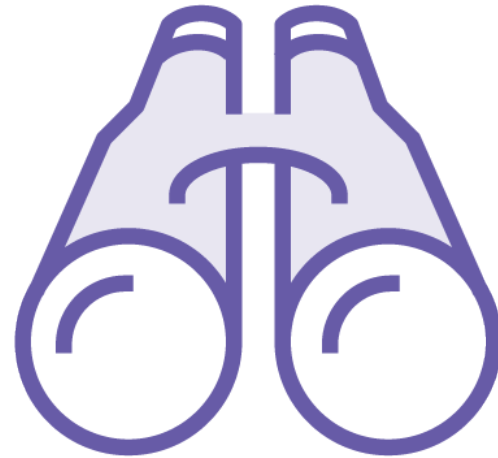
LastName ▲	FirstName	BusinessEntityID	SalesAmount
Adams	Ben	1770	\$4,337.5600000000000004
Adams	Edward	3731	\$1,732.26
Adams	Wyatt	3805	\$21.98
Adams	Fernando	3889	\$1,120.49
Adams	Jeremy	4034	\$39.980000000000000004
Adams	Blake	4194	\$1,735.98
Adams	Seth	4350	\$2,342.92999999999998
Adams	Xavier	4429	\$556.2599999999999999



Defining New Columns

$a + b \rightarrow ab$

Concatenation
Combine separate
string values into
single string



Lookup
“Borrow” values from
another related table

$1 \rightarrow \text{True}$

Translation
Convert one value into
another value



DAX

Data Analysis Expressions... a language for defining measures and columns in Power BI data models



Excel Versus DAX

	A	B	C	D	E	F	G
1		1/1/2008	2/1/2008	3/1/2008	4/1/2008	5/1/2008	6/1/2008
2	Mountain-200 Black, 38	\$66,095.71	\$122,552.47	\$145,163.63	\$85,880.36	\$154,131.53	\$166,616.27
3	Road-250 Black, 44	\$58,640.40	\$83,562.57	\$76,232.52	\$63,038.43	\$79,164.54	\$57,174.39
4	Touring-1000 Blue, 46	\$60,078.56	\$90,117.85	\$92,978.73	\$67,832.51	\$81,535.19	\$134,461.55
5							
6							
7				=B2			

Excel

=B2 + C2

=SUM(B2:B4)

BusinessEntityID	SalesOrderNumber	SalesOrderDetail	OrderDate	Product	ProductCategory	SalesAmount
2680	SOS1308	38111	6/7/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
3015	SOS1569	38847	6/22/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
5446	SOS2066	43377	7/4/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
3120	SOS1523	38719	6/20/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
3112	SOS1524	38723	6/20/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
3148	SOS2265	43853	7/7/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
3183	SOS1487	38616	6/18/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
3560	SOS1554	38801	6/22/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
3876	SOS1467	38556	6/17/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
3887	SOS1452	38516	6/15/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
4079	SOS1356	38245	6/9/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
4363	SOS1230	37906	6/2/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
4510	SOS1371	38294	6/10/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
4586	SOS1488	38620	6/18/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
5154	SOS1369	38285	6/10/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
6762	SOS2105	43463	7/4/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
19134	SOS1417	38417	6/13/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
6679	SOS1345	38211	6/9/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
5887	SOS2058	43358	7/3/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
5714	SOS2130	43519	7/5/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
6261	SOS2267	43861	7/7/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
8642	SOS2179	43638	7/6/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
5891	SOS2044	43326	7/3/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99
6147	SOS2132	43522	7/5/13 12:00:00 AM	Water Bottle - 30 oz.	Accessories	\$4.99

DAX

=COUNTROWS(Customer)

=SUM('Sales'[SalesAmount])



Concatenating Columns

Produce new columns for reporting

LastName	FirstName	City	StateProvinceName
Adams	Aaron	Downey	California
Adams	Adam	Newport Beach	California
Adams	Alex	Lake Oswego	Oregon
Adams	Alexandra	Burlingame	California
Adams	Amanda	Fremont	California
Adams	Andrea	West Covina	California

Single columns

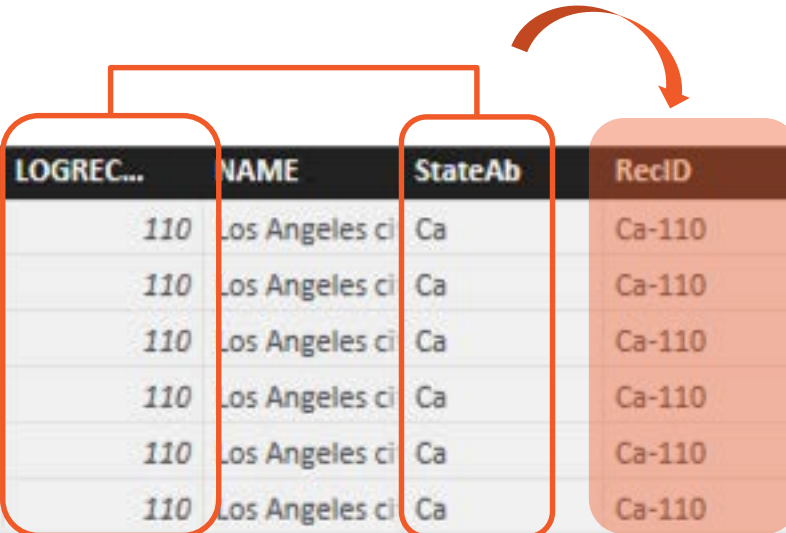
CustomerName	CityState
Adams, Aaron	Downey, California
Adams, Adam	Newport Beach, California
Adams, Alex	Lake Oswego, Oregon
Adams, Alexandra	Burlingame, California
Adams, Amanda	Fremont, California
Adams, Andrea	West Covina, California

Concatenated columns



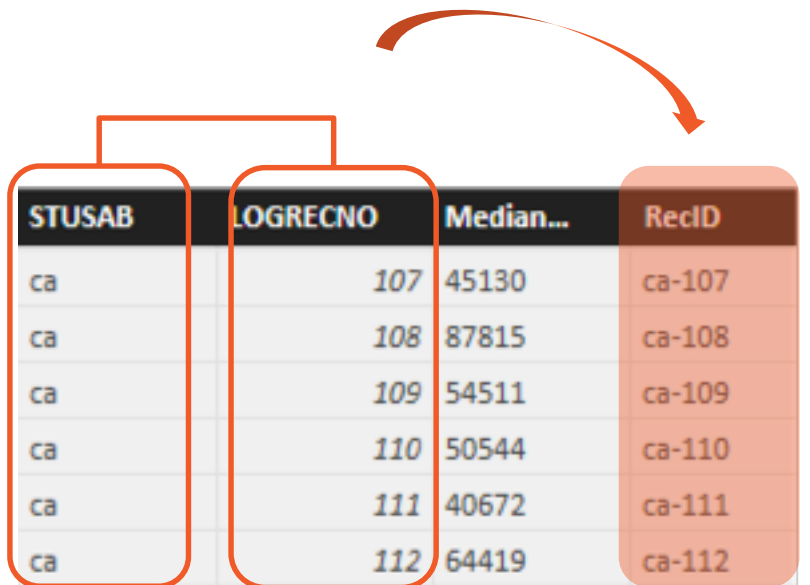
Concatenating Columns

Produce new columns for lookups



Zip Code	STATE	PLACE	LOGREC...	NAME	StateAb	RecID
90001	6	44000	110	Los Angeles ci	Ca	Ca-110
90002	6	44000	110	Los Angeles ci	Ca	Ca-110
90003	6	44000	110	Los Angeles ci	Ca	Ca-110
90004	6	44000	110	Los Angeles ci	Ca	Ca-110
90005	6	44000	110	Los Angeles ci	Ca	Ca-110
90006	6	44000	110	Los Angeles ci	Ca	Ca-110

Location



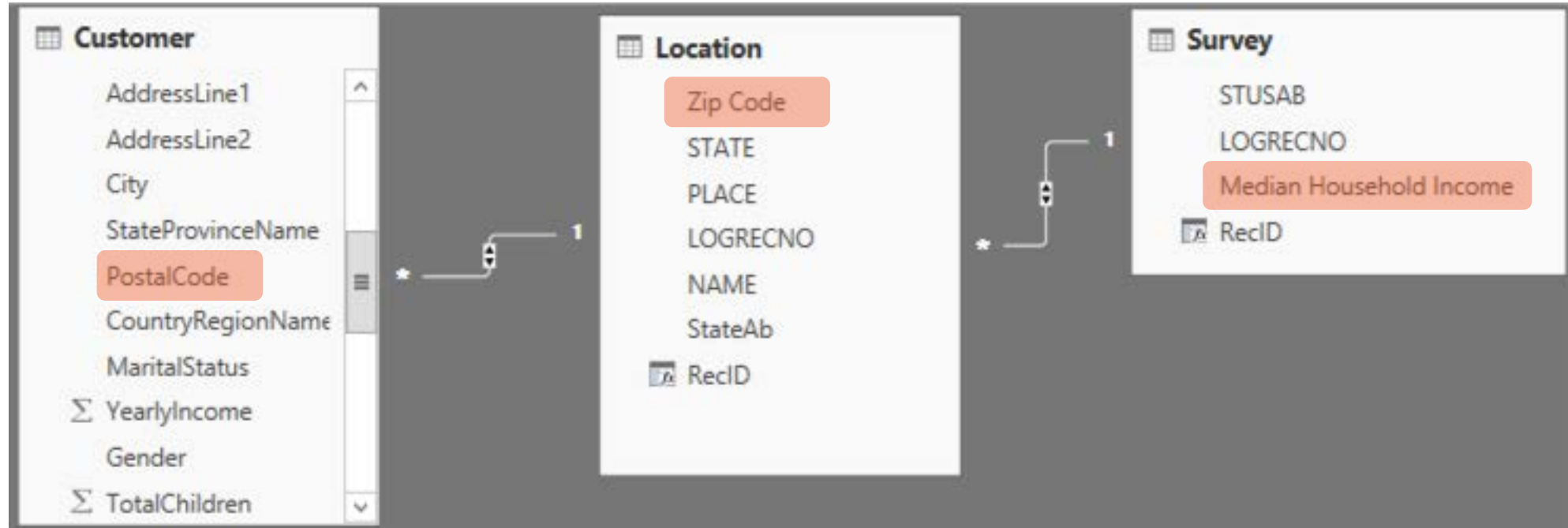
STUSAB	LOGRECNO	Median...	RecID
ca	107	45130	ca-107
ca	108	87815	ca-108
ca	109	54511	ca-109
ca	110	50544	ca-110
ca	111	40672	ca-111
ca	112	64419	ca-112

Survey

Requires unique values



Performing a Lookup to a Related Table



SurveyMedian=related(Survey[Median Household Income])



Translating a Value

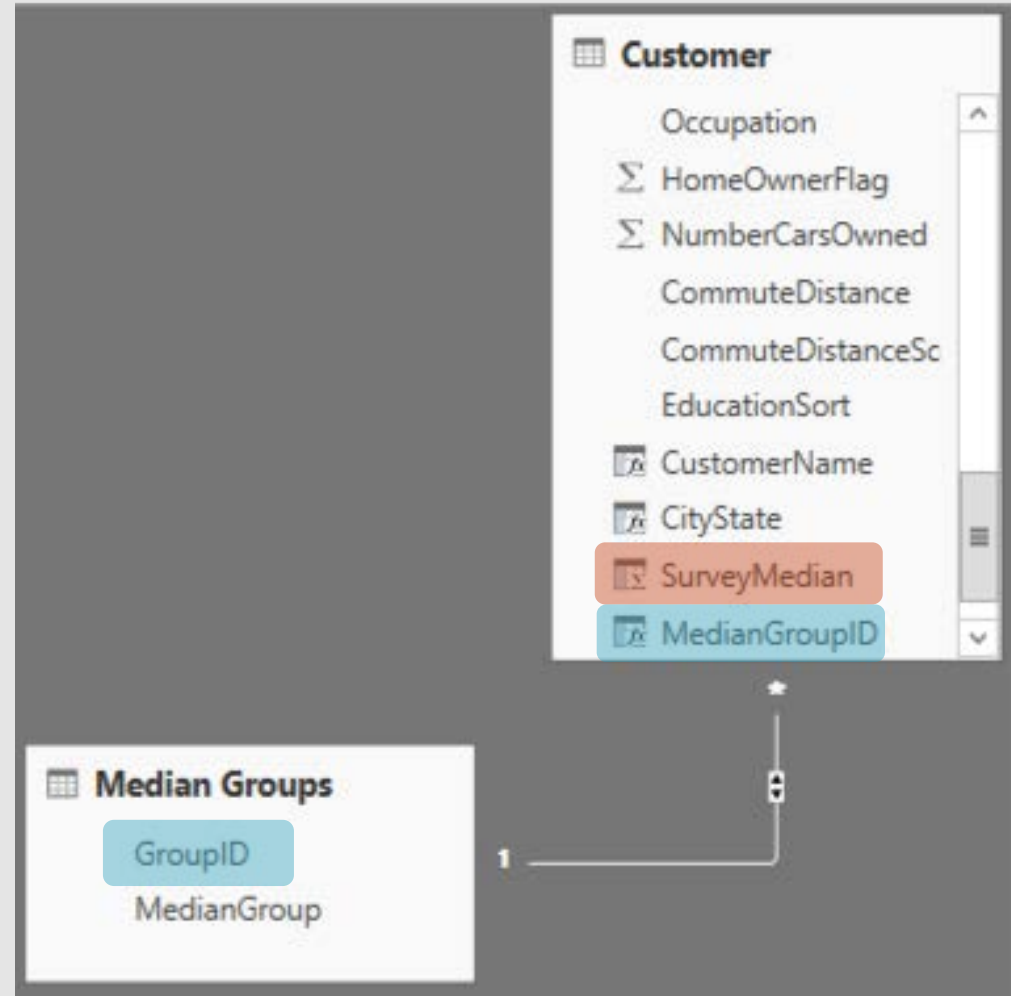


Homeowner =
if([HomeOwnerFlag]=0,
"Not Homeowner",
"Homeowner")



Translating a Value

```
MedianGroupID =  
if(isblank(Customer[SurveyMedian]),  
    0,  
    if(Customer[YearlyIncome]<  
        Customer[SurveyMedian],  
        1,  
        2))
```



Adding a Date Table

Date
1/1/11
1/2/11
1/3/11
1/4/11
1/5/11

Date =
CALENDARAUTO()

Year
2011
2011
2011
2011
2011

Year =
YEAR([Date])

MonthYear
Jan 2011
Jan 2011
Jan 2011
Jan 2011
Jan 2011

MonthYear =
format([Date],
"MMM")
& " " & [Year]



Sorting a Date Table

MonthSort
2011-01
2011-01
2011-01
2011-01
2011-01

```
MonthSort =  
  year([Date])  
  & "-"  
  & right(  
    "0" & MONTH([Date])  
    , 2)
```



Summary



Creating relationships

Defining new columns

Adding a date table



Additional Resources



DAX Basics in Power BI Desktop

- <https://powerbi.microsoft.com/en-us/documentation/powerbi-desktop-quickstart-learn-dax-basics/>