Column Roles

This page describes the concept and use of *roles* in chart data tables.

What Are Roles?

Google DataTable and DataView objects now support explicitly assigned *column roles*. A column role describes the purpose of the data in that column: for example, a column might hold data describing tooltip text, data point annotations, or uncertainty indicators.

Note: if you're looking to control the content of the tooltips that appear when the user hovers over a chart, see Tooltips (https://google-developers.appspot.com/chart/interactive/docs/customizing_tooltip_content).

Previously, there were only two roles available to a column: 'domain,' which specifies major axis labels; and 'data,' which specifies bar heights, pie slice widths, and so on. These roles were assigned implicitly, based on the order and type of the columns in the table. However, with the ability to explicitly assign column roles, you can now add optional columns that provide new, interesting features to a chart such as arbitrary annotation labels, hovertext, and uncertainty bars.

If you do not explicitly assign a column's role, its role is inferred by the column's order in the table, according to the chart's data format specification, and you will be limited to the standard domain and data roles. This page will show you what roles are available, and how to assign column roles.

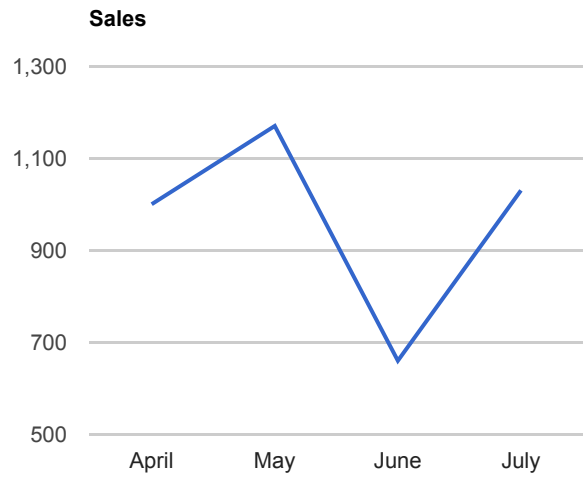
Here is a comparison of what you can do with a line chart using only the default, inferred roles, compared to additional, explicitly assigned roles.

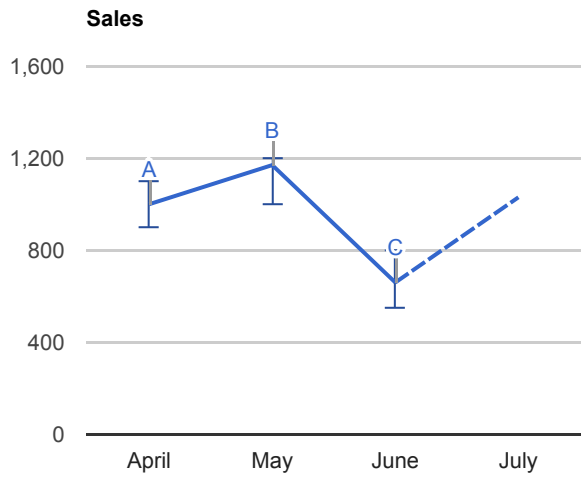
Line chart data table format:

	Column 0
Purpose	• X-axis group labels (discrete (https://google-developers.appspot.com/chart/interactive/docs/customizing_axes#Discrete_vs_Continuc) • X-axis values (continuous (https://google-developers.appspot.com/chart/interactive/docs/customizing_axes#Discrete_vs_Continuc

	)
Data Type	• string (discrete (https://google-developers.appspot.com/chart/interactive/docs/customizing_axes#Discrete_vs_Continuc) • number, date, datetime or timeofday (continuous (https://google-developers.appspot.com/chart/interactive/docs/customizing_axes#Discrete_vs_Continuc)
Role	domain
Optional supported column roles	• annotation • annotationText

Chart Without Explicit Column Roles	Chart With Explicit Column Roles





This chart does not apply roles explicitly, and so can only use the basic data and domain column layout shown above.

DataTable:

```
var data = new google.visualization.Dat
data.addColumn('string', 'Month'); // I
data.addColumn('number', 'Sales'); // I
data.addRows([
  ['April',1000],
  ['May',  1170],
  ['June',  660],
  ['July', 1030]
]);
```

This chart assigns roles explicitly, and so the optional columns can be added. This chart has optional columns for annotation, annotationText, interval, and certainty roles.

- **annotation** columns specify static labels in the chart; here, 'A', 'B', 'C' are annotations.
- **annotationText** columns specify hovertext when you mouse over the annotation (*not* the data point).
- **interval** columns specify the top and bottom points of I-bars on the chart. There are three I-bars in the chart.
- **certainty** columns indicate whether the data at that point is certain. The last data point is uncertain, and so the line leading to it is dashed.

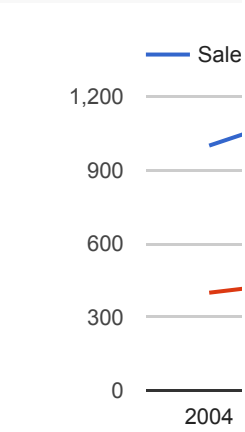
DataTable:

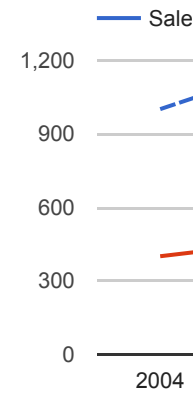
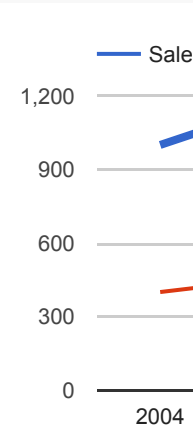
```
var data = new google.visualization.Dat
data.addColumn('string', 'Month'); // I
data.addColumn('number', 'Sales'); // I
data.addColumn({type:'number', role:'in
data.addColumn({type:'number', role:'in
data.addColumn({type:'string', role:'an
data.addColumn({type:'string', role:'an
data.addColumn({type:'boolean',role:'ce
data.addRows([
```

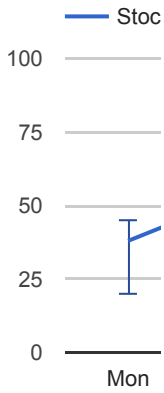
```
    ['April',1000,  900, 1100,  'A','St
    ['May',  1170, 1000, 1200,  'B','Cc
    ['June',  660,  550,  800,  'C','Wu
    ['July', 1030, null, null, null, nu
]);
```

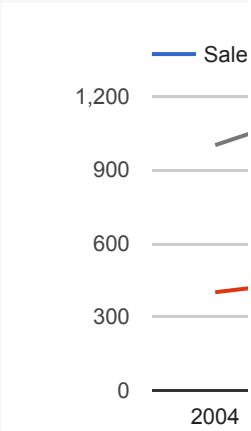
What Roles Are Available?

The following table lists all the roles suported by Google Charts. Not all roles are supported by all chart types; each chart's documentation will describe which roles are available, and where they go. Roles are rendered differently for different chart types.

Role	Description	Example
annotation	Text to display on the chart near the associated data point. The text displays without any user interaction. Annotations and annotation text can be assigned to both data points and categories (axis labels). There are two styles of annotations: point (*default*), which draws the annotation text near the specified point, and line, which draws the annotation text on a line that bisects the chart area. You can specify the line style by setting this chart option: **`annotations: {'column_id': {style: 'line'}}`** **Data type: string** **Default: Empty string**	 **Data:** `label: 'Year', role: domain, '2004', '2005', '2006', '2007',` The 'A' and 'B' in this annotation text. Not which it is applied, t Null values are acce you have an annotat
annotationText	Extended text to display when the user hovers over the associated annotation. Annotations and annotation text can be assigned to both data points and categories (axis labels). If you have an annotationText column, you must also have an annotation column. Tooltip text, in contrast, is displayed when the user hovers over the associated *data point* on the chart. **Data type: string** **Default: Empty string**	
certainty	Indicates whether a data point is certain or not. How this is displayed	

	depends on the chart type—for example, it might be indicated by dashed lines or a striped fill. For line and area charts, the segment between two data points is certain if and only if both data points are certain. **Data type: boolean**, where true is certain, false is uncertain. **Default: true**	 **Data:** `label: 'Year', role: domain, '2004', '2005', '2006', '2007',` In this chart, the 'S segment, becaus 'Expenses' series uncertainty of the
emphasis	Emphasizes specified chart data points. Displayed as a thick line and/or large point. For line and area charts, the segment between two data points is emphasized if and only if both data points are emphasized. **Data type: boolean** **Default: false**	 **Data:**

		label: 'Year', role: domain, '2004', '2005', '2006', '2007', In this chart, the 'Sal three, rows one and designated by the fi requires both bound
interval	Indicates potential data range for a specific point. Intervals are usually displayed as I-bar style range indicators. Interval columns are numeric columns; add interval columns in pairs, marking the low and high value of the bar. Interval values should be added in increasing value, from left to right. **Data type: number** **Default: No interval**	 **Data:** label: 'Day', role: domain, 'Mon', 'Tue', 'Wed', 'Thurs', In this chart, the inte increase from left to top and bottom of th
scope	Indicates whether a point is in or out of scope. If a point is out of scope, it is visually de-emphasized. For line and area charts, the segment between two data points is in scope if *either* endpoint is in scope. **Data type: boolean**, where true means in scope. **Default: true**	



Data:

```
label: 'Year',
 role: domain,
       '2004',
       '2005',
       '2006',
       '2007',
```

The first scope colu
segment is rendered
The second scope c
segment is marked
rest of the line is ou

style

Styles certain properties of different aspects of your data. Those values are:

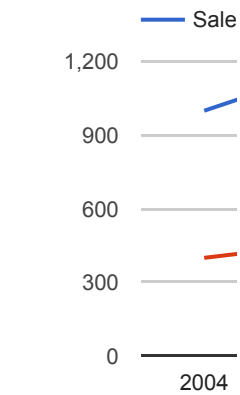
- `color`
- `opacity`
- `stroke-width`
- `stroke-color`
- `stroke-opacity`
- `fill-color`
- `fill-opacity`

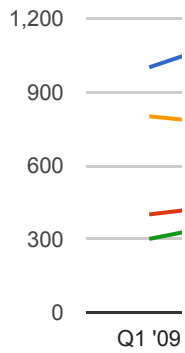
Data Type: string, where multiple styles can be applied using a `'firstProperty: value; secondProperty: value'` syntax, or set specific styles for `bar`, `line`, and `point` by specifying the type and wrapping the style properties inside curly braces (e.g. `bar { //properties go here }`).

Data:

```
label: 'Charact
role:  domain,
```

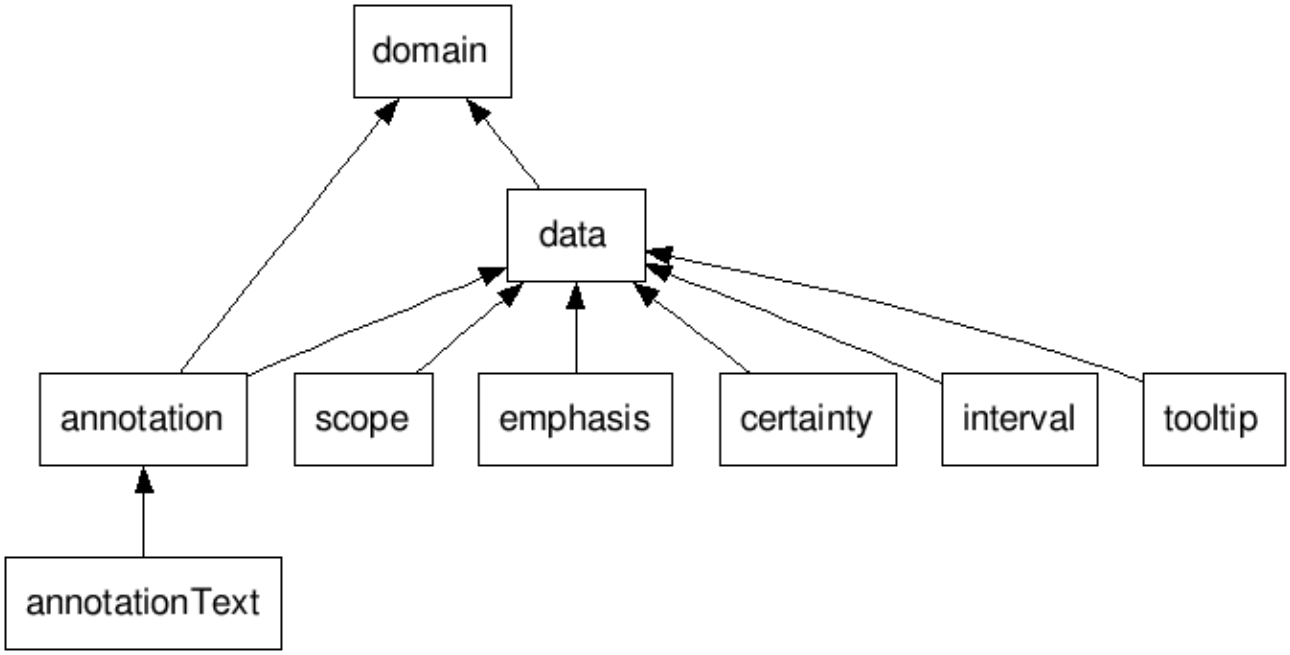
	Default: null	`'Hulk',`
		`'Captain Americ`
		
		`'Wolverine',`
		
		`'Iron Man',`
		
		`'Spider Man',`
		
		In this chart, each ba
		role. Styles can be s
		generally, which will
		of chart.

tooltip	Text to display when the user hovers over the data point associated with this row. **Note:** this is **not** supported by the Bubble Chart (https://google-developers.appspot.com/chart/interactive/docs/gallery/bubblechart) visualization. The content of Bubble Chart HTML tooltips is not customizable. **Data type: string** **Default: Data point value**	 **Data:** *label*: 'Year', *role*: domain, '2004', '2005', '2006',

		'2007',
		Hover over the data points in both lines,
domain	*You should not need to assign this role explicitly unless designing a multi-domain chart (shown here); the basic format of the data table enables the charting engine to infer which columns are domain columns. However, you should be aware of which columns are domain columns so that you know which other columns can modify it.* Domain columns specify labels along the major axis of the chart. Multiple domain columns can sometimes be used to support multiple scales within the same chart. **Data type: Usually string**, but occasionally number or date	 **Data:** *label*: '2009, Quarter', *role*: domain, 'Q1/09', 'Q2/09', 'Q3/09', 'Q4/09', This example demo modify the first dom second domain ("20 scales.
data	*You should not need to assign this role explicitly; the basic format of the data table enables the charting engine to infer which columns are domain columns. However, you sould be aware of which columns are data columns so that you know which other columns can modify it.* Data role columns specify series data to render in the chart. For most charts, one column = one series, but this can vary by chart type (for example, scatter charts require two data columns for the first series, and an additional one for each additional series; candlestick charts require four data columns for each series). **Data type: number**	

Role Hierarchy and Associativity

The following diagram shows which role columns can apply to which other role columns. All columns except domain columns apply to the **nearest left neighbor** to which it can be applied.



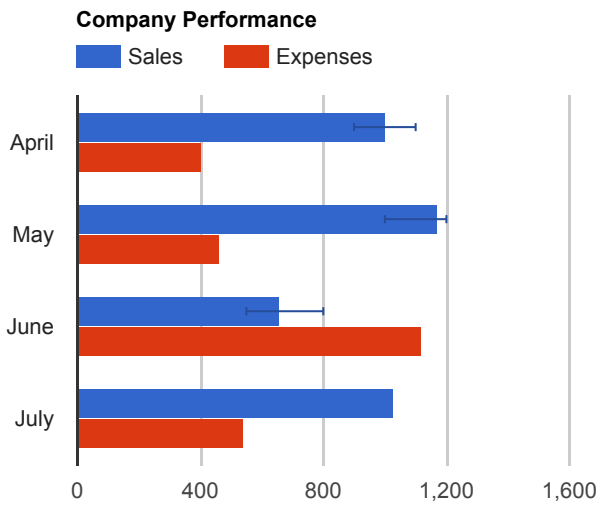
So, for example, a **scope** column applies to the nearest **data** column on its left; an **annotationText** column will apply to the nearest **annotation** column to its left; an **annotation** will apply to the nearest **data** or **domain** column to its left.

Assigning a Role

Roles are assigned as a property of the column in a DataTable object. There are several ways to create a role column, but here are the most common:

- DataTable.addColumn() (#addcolumnmethod)
- JavaScript literal notation (#jsonliteral)
- DataView.setColumns() (#dataview.setcolumnsmethod)

The first two techniques draw the following chart:



DataTable.addColumn Method

The following example creates a bar chart with an interval marker on three of the bars. The interval markers are specified by the third and fourth columns using the DataTable.addColumn() (https://google-developers.appspot.com/chart/interactive/docs/reference#DataTable_addColumn) method.

```
      var data = new google.visualization.DataTable();
      data.addColumn('string', 'Month'); // Implicit domain column.
      data.addColumn('number', 'Sales'); // Implicit data column.
      data.addColumn({type:'number', role:'interval'});
      data.addColumn({type:'number', role:'interval'});
      data.addColumn('number', 'Expenses');
      data.addRows([
        ['April',1000,  900, 1100,   400],
        ['May',  1170, 1000, 1200,   460],
        ['June',  660,  550,  800,  1120],
        ['July', 1030,    ,     ,   540]
      ]);

      var chart = new google.visualization.BarChart(
              document.getElementById('visualization'));
      chart.draw(data,
         {width: 800, height: 600, title: 'Company Performance'});
```

JavaScript Literal Notation

In JSON literal, you must specify a `p` property of the column with the value `"role":"role-type"`. The following example demonstrates how to specify roles using JavaScript literal

notation. This can only be done at table creation time.

```
{"cols":[
  {"id":"","label":"Month","pattern":"","type":"string"},
  {"id":"","label":"Sales","pattern":"","type":"number"},
  {"id":"","label":"","pattern":"","type":"number","p":{"role":"interval"}},
  {"id":"","label":"","pattern":"","type":"number","p":{"role":"interval"}},
  {"id":"","label":"Expenses","pattern":"","type":"number"}],
"rows":[
  {"c":[
    {"v":"April","f":null},
    {"v":1000,"f":null},
    {"v":900,"f":null},
    {"v":1100,"f":null},
    {"v":400,"f":null}]},
  {"c":[
    {"v":"May","f":null},
    {"v":1170,"f":null},
    {"v":1000,"f":null},
    {"v":1200,"f":null},
    {"v":460,"f":null}]},
  {"c":[{"v":"June","f":null},
    {"v":660,"f":null},
    {"v":550,"f":null},
    {"v":800,"f":null},
    {"v":1120,"f":null}]},
  {"c":[
    {"v":"July","f":null},
    {"v":1030,"f":null},
    {"v":null,"f":null},
    {"v":null,"f":null},
    {"v":540,"f":null}]}],
"p":null
}
```

DataView.setColumns Method

When creating a view, you can explicitly set the role of a column. This is useful when creating a new calculated column. See **`DataView.setColumns()`** (https://google-developers.appspot.com/chart/interactive/docs/reference#DataView_setColumns) for more information.

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