

## 12.1.3 Create a Bar Chart

**Roza** can now create a basic line chart in Plotly. She knows how to create a new graph, place it in an HTML document, and format the data for Plotly.

A line chart isn't suitable for all data visualizations, however. For example, a line chart will generally do a better job of displaying trends, but a bar chart may be more appropriate to visualize how data is distributed across a number of categories.

Roza has decided to build on her foundations and explore other types of graphs available in Plotly. She'll begin with some other charts, such as a bar chart, a scatter plot, and a pie chart.

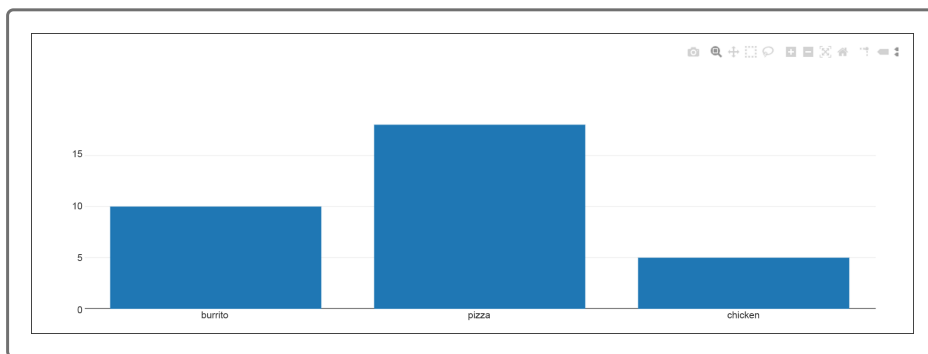
A chart is hard to decipher without appropriate labels. Roza will therefore also learn to customize other elements of her charts, such as axis labels and titles.

To help Roza improve her visualization skills using Plotly, we'll use an example of ordering food for a department luncheon.

The 33 people in the department are surveyed about their lunch preferences. They were asked to choose burritos, pizza, or chicken for the department lunch. 10 voted for burritos, 18 for pizza, and 5 for chicken. Let's help Roza plot the results.

### NOTE

The terms *graph*, *chart*, and *plot* are used interchangeably here.



Now look at the code used to create this bar chart.

```
var trace = {  
  x: ["burrito", "pizza", "chicken"],  
  y: [10, 18, 5],  
  type: "bar"  
};  
Plotly.newPlot("plotArea", [trace]);
```

There are several differences between the code seen here and the code from the first chart we created.

```
Plotly.newPlot("plotArea", [{x:[1,2,3], y:[10,20,30]}]);
```

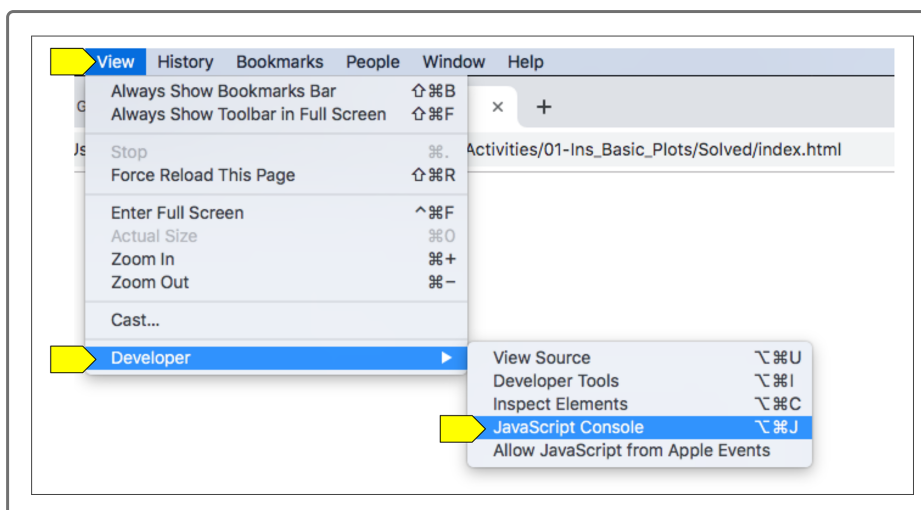
- The data is no longer contained inside the `Plotly.newPlot()` method. The object that contains the `x` and `y` arrays is instead assigned to the variable `trace`. This variable, `trace`, is the second argument of the `newPlot()`. Note, however, that the contents of the variable have been enclosed inside an array. The effect is still the same: an object contained inside an array.
- The `trace` object now specifies the chart as a bar chart with `type: "bar"`.

Note that it makes sense to assign the data to a variable, as it would be very unwieldy to place an entire dataset inside the `Plotly.newPlot()` function call.



## Troubleshooting

Every programmer runs into errors: troubleshooting is part of the job! If a plot doesn't render in the browser, try inspecting the browser console. In Chrome, you would click on View in the menu, followed by Developer, then JavaScript Console:





## Choose Layout Options

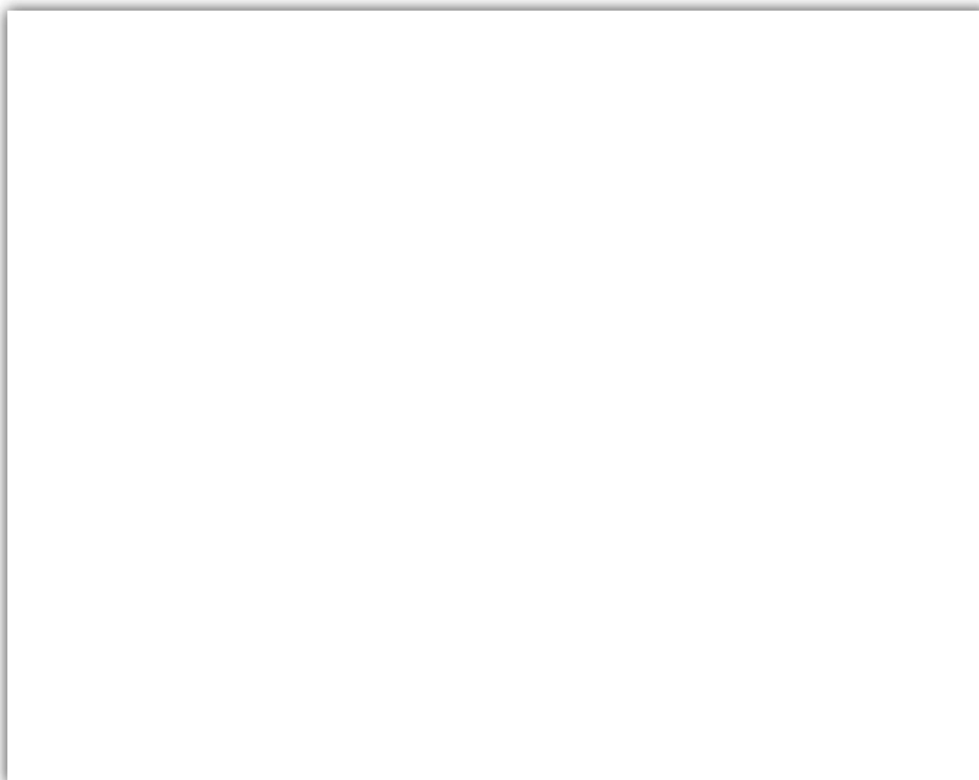
So far, so good! But something is still missing. The chart would be vastly improved by including a title and axis labels. A good data visualization practice is to make graphs as clear as possible to viewers. Adding a title and labeling the axes will help them understand what they see. Let's first add a title to the graph.

Take a look at our code.

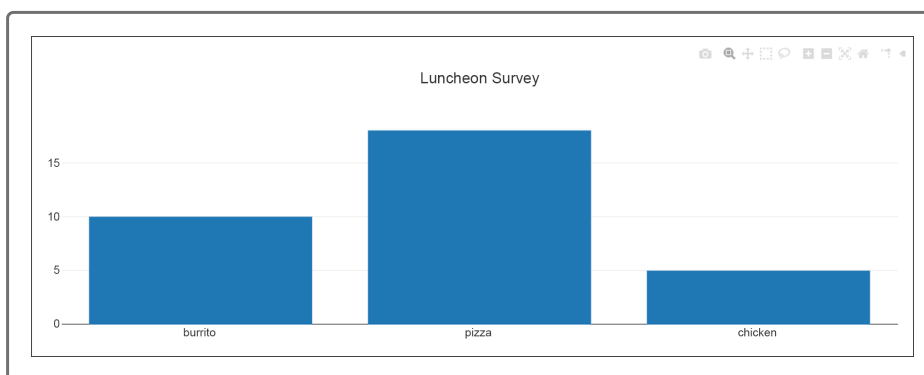
```
var trace = {  
  x: ["burrito", "pizza", "chicken"],  
  y: [10, 18, 5],  
  type: "bar"  
};  
  
var layout = {  
  title: "Luncheon Survey"  
};  
  
Plotly.newPlot("plotArea", [trace], layout);
```

What do you notice that's different?

1. There is an object assigned to the variable `layout`. It contains the key `title` and the value `"Luncheon Survey"`.
2. `Plotly.newPlot()` now has a third argument: `layout`, which refers to the object we just discussed.



The chart now has a title:

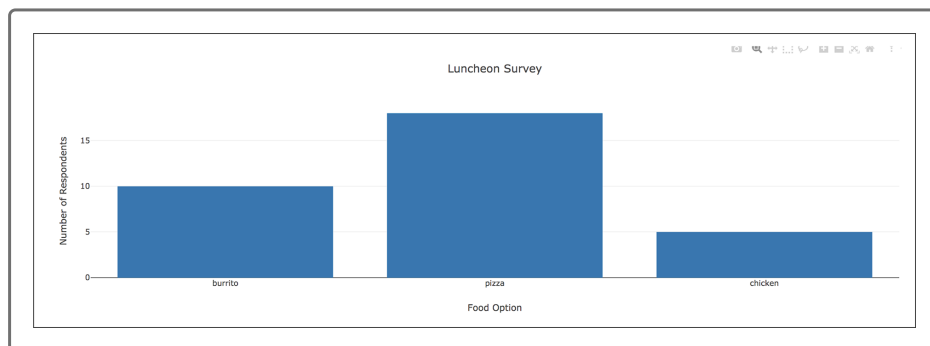


This is a great addition, but our chart is still missing axis labels. From glancing at this chart, we know that the label on the x-axis for each column is the food item. What about the y-axis, though? It's difficult to determine at a glance what the numbers mean. For example, does "10" for burrito indicate that 10 types of burritos were ordered? Labeling the axes on a chart helps avoid this ambiguity.

Take a look at the code. What do you notice?

```
var layout = {  
  title: "Luncheon Survey",  
  xaxis: {title: "Food Option"},  
  yaxis: {title: "Number of Respondents"}  
};  
Plotly.newPlot("plotArea", trace, layout);
```

In the same `layout` object, two key-value pairs have been added. The first key, `xaxis`, denotes the axis label for the x-axis. Its value, `{title: "Food Option"}`, is itself an object whose key is `title` and whose value is `Food Option`. The same format holds for the y-axis label.



## SKILL DRILL

Open VS Code and create a new bar chart with Plotly. This graph will chart several beverages and the percentage of the total number of orders they comprise in a popular nonalcoholic bar. Here is your data:

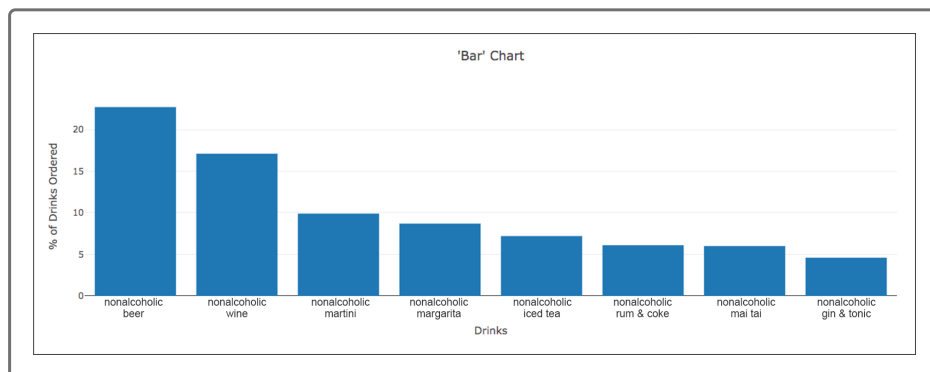
```
Drinks: ["nonalcoholic beer", "nonalcoholic wine", "nonalcoholic martini",  
"nonalcoholic margarita", "ice tea", "nonalcoholic rum & coke", "nonalcoholic  
mai tai", "nonalcoholic gin & tonic"]
```

```
Percent of Drinks Ordered: [22.7, 17.1, 9.9, 8.7, 7.2, 6.1, 6.0, 4.6]
```

Be sure to give the plot a title and label the axes.

Roza decides to create a "bar" chart of popular beverages in a nonalcoholic bar, as well. This is her code:

```
var trace = {  
  x: ["nonalcoholic beer", "nonalcoholic wine", "nonalcoholic martini", "nona  
  y: [22.7, 17.1, 9.9, 8.7, 7.2, 6.1, 6.0, 4.6],  
  type: "bar"  
};  
var data = [trace];  
var layout = {  
  title: "'Bar' Chart",  
  xaxis: {title: "Drinks"},  
  yaxis: {title: "% of Drinks Ordered"}  
};  
Plotly.newPlot("plotArea", data, layout);
```



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