datacamp plotly

Data Visualization with Plotly Express in Python

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> What is plotly?

Plotly Express is a high-level data visualization package that allows you to create interactive plots with very little code. It is built on top of Plotly Graph Objects, which provides a lower-level interface for developing custom visualizations.

> Interactive controls in Plotly

Plotly plots have interactive controls shown in the top-right of the plot. The controls allow you to do the following:

- **Download plot as a png:** Save your interactive plot as a static PNG.
- **Zoom:** Zoom in on a region of interest in the plot.
- **Pan:** Move around in the plot.
- **Box Select:** Select a rectangular region of the plot to be highlighted.
- **Lasso Select:** Draw a region of the plot to be highlighted.
- **Autoscale:** Zoom to a "best" scale.
- **Reset axes:** Return the plot to its original state.
- **Toggle Spike Lines:** Show or hide lines to the axes whenever you hover over data.
- **Show closest data on hover:** Show details for the nearest data point to the cursor.
- **Compare data on hover:** Show the nearest data point to the x-coordinate of the cursor.

> Plotly Express code pattern

The code pattern for creating plots is to call the plotting function, passing a data frame as the first argument. The x argument is a string naming the column to be used on the x-axis. The y argument can either be a string or a list of strings naming column(s) to be used on the y-axis.

```
px.plotting_fn(dataframe, # Dataframe being visualized
               x=["column-for-x-axis"], # Accepts a string or a list of strings
               y=["columns-for-y-axis"], # Accepts a string or a list of strings
               title="Overall plot title", # Accepts a string
               xaxis_title="X-axis title", # Accepts a string
               yaxis_title="Y-axis title", # Accepts a string
               width=width_in_pixels, # Accepts an integer
               height=height_in_pixels) # Accepts an integer
```

> Common plot types

Import plotly

```
# import plotly express as px
import plotly.express as px
```

Scatter plots

```
# Create a scatterplot on a DataFrame named clinical_data
px.scatter(clinical_data, x="experiment_1", y="experiment_2")
```

Set the `size` argument to the name of a numeric column to control the size of the points and create a bubble plot.

Line plots

```
# Create a lineplot on a DataFramed named stock_data
px.line(stock_data, x="date", y=["FB", "AMZN"])
```

Set the `line_dash` argument to the name of a categorical column to have dashes or dots for different lines.

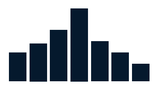
Bar plots

```
# Create a barplot on a DataFramed named commodity_data
px.bar(commodity_data, x="nation", y=["gold", "silver", "bronze"],
       color_discrete_map={"gold": "yellow",
                           "silver": "grey",
                           "bronze": "brown"})
```

Swap the `x` and `y` arguments to draw horizontal bars.

Histograms

```
# Create a histogram on a DataFramed named bill_data
px.histogram(bill_data, x="total_bill")
```



Set the `nbins` argument to control the number of bins shown in the histogram.

Heatmaps

```
# Create a heatmap on a DataFramed named iris_data
px.imshow(iris_data.corr(numeric_only=True),
          zmin=-1, zmax=1, color_continuous_scale='rdbu')
```

Set the `text_auto` argument to `True` to display text values for each cell.

> Customizing plots in plotly

The code pattern for customizing a plot is to save the figure object returned from the plotting function, call its `.update_traces()` method, then call its `.show()` method to display it.

```
# Create a plot with plotly (can be of any type)
fig = px.some_plotting_function()
# Customize and show it with .update_traces() and .show()
fig.update_traces()
fig.show()
```

Customizing markers in Plotly

When working with visualizations like scatter plots, lineplots, and more, you can customize markers according to certain properties. These include:

- `size`: set the marker size
- `color`: set the marker color
- `opacity`: set the marker transparency
- `line`: set the width and color of a border
- `symbol`: set the shape of the marker

```
# In this example, we're updating a scatter plot named fig_sct
fig_sct.update_traces(marker={"size": 24,
                              "color": "magenta",
                              "opacity": 0.5,
                              "line": {"width": 2, "color": "cyan"},
                              "symbol": "square"})
fig_sct.show()
```

Customizing lines in Plotly

When working with visualizations that contain lines, you can customize them according to certain properties. These include:

- `color`: set the line color
- `dash`: set the dash style (`"solid"`, `"dot"`, `"dash"`, `"longdash"`, `"dashdot"`, `"longdashdot"`)
- `shape`: set how values are connected (`"linear"`, `"spline"`, `"hv"`, `"vh"`, `"hvh"`,`"vhv"`)
- `width`: set the line width

```
# In this example, we're updating a scatter plot named fig_ln
fig_ln.update_traces(patch={"line": {"dash": "dot",
                                     "shape": "spline",
                                     "width": 6}})
fig_ln.show()
```

Customizing bars in Plotly

When working with barplots and histograms, you can update the bars themselves according to the following properties:

- `size`: set the marker size
- `color`: set the marker color
- `opacity`: set the marker transparency
- `line`: set the width and color of a border
- `symbol`: set the shape of the marker

```
# In this example, we're updating a scatter plot named fig_bar
fig_bar.update_traces(marker={"color": "magenta",
                              "opacity": 0.5,
                              "line": {"width": 2, "color": "cyan"}})
fig_bar.show()
```

```
# In this example, we're updating a histogram named fig_hst
fig_hst.update_traces(marker={"color": "magenta",
                              "opacity": 0.5,
                              "line": {"width": 2, "color": "cyan"}})
fig_hst.show()
```