Custom Buttons in Python

How to add custom buttons to update Plotly chart attributes in Python.

Methods

The updatemenu method (https://plot.ly/python/reference/layout/updatemenus/#layout-updatemenus-items-updatemenu-buttons-items-button-method) determines which plotly.js function (https://plot.ly/javascript/plotlyjs-function-reference/) will be used to modify the chart. There are 4 possible methods:

- "restyle": modify **data** or data attributes
- "relayout": modify **layout** attributes
- "update": modify **data and layout** attributes; combination of "restyle" and "relayout"
- "animate": start or pause an animation (https://plot.ly/python/#animations))

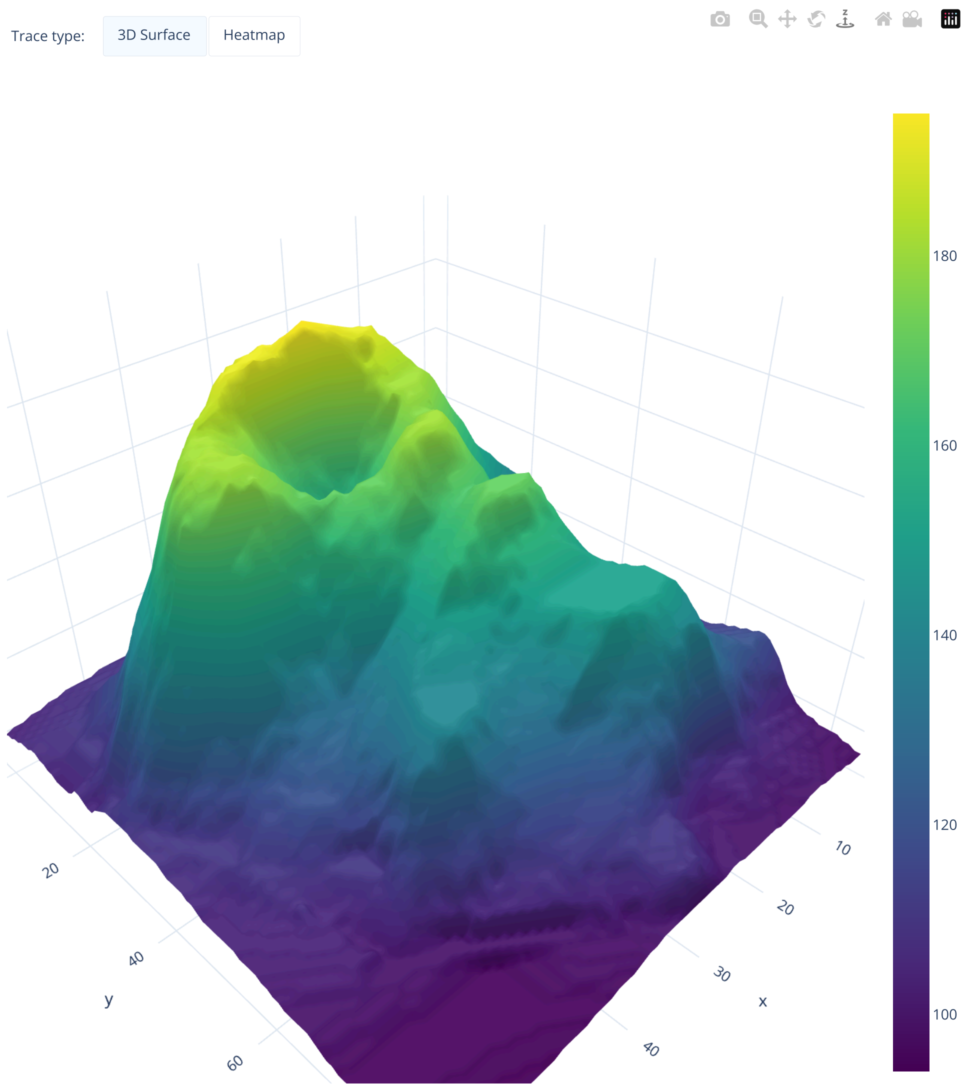
Restyle Button

The "restyle" method should be used when modifying the data and data attributes of the graph.

Update One Data Attribute

This example demonstrates how to update a single data attribute: chart type with the "restyle" method.

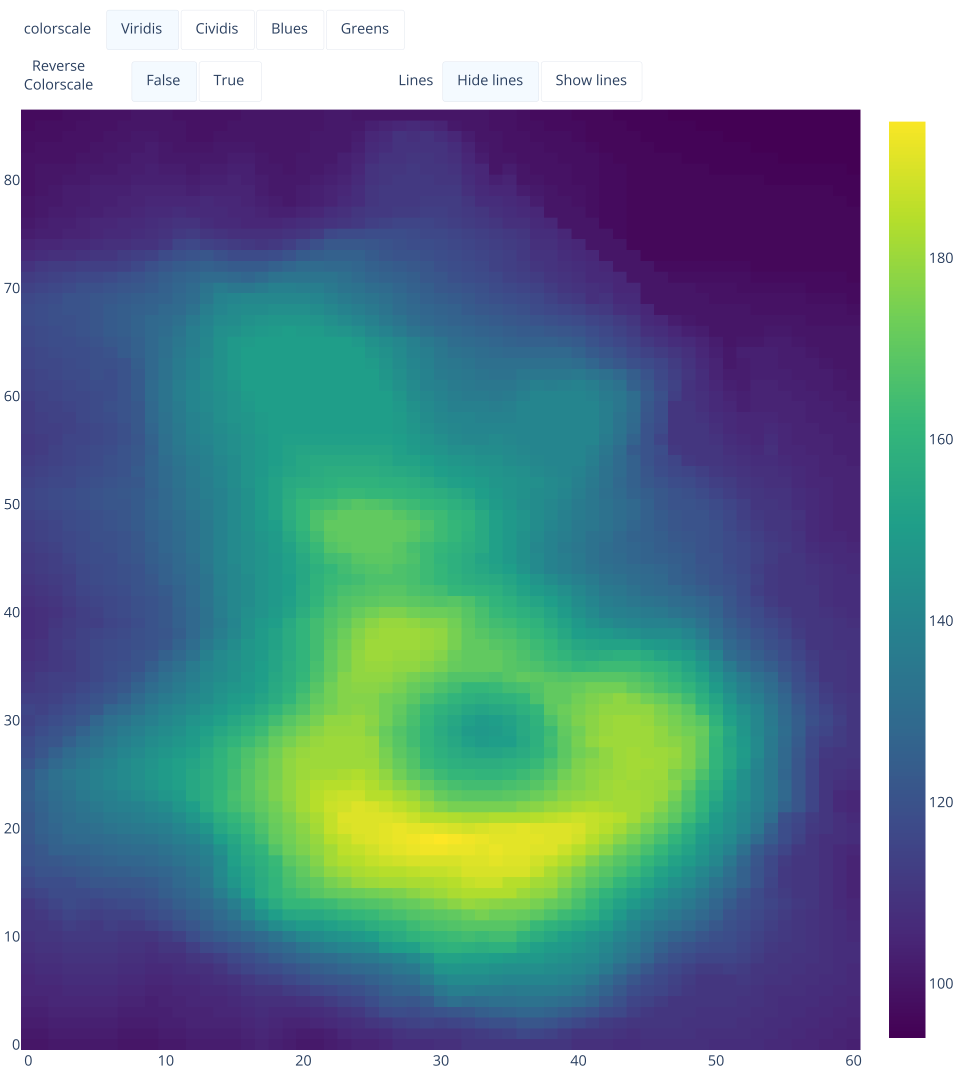
```python
import plotly.graph_objects as go

import pandas as pd

# load dataset
df = pd.read_csv("https://raw.githubusercontent.com/plotly/datasets/master/volcano.csv")

# create figure
fig = go.Figure()

# Add surface trace
fig.add_trace(go.Surface(z=df.values.tolist(), colorscale="Viridis"))

# Update plot sizing
fig.update_layout(
    width=800,
    height=900,
    autosize=False,
    margin=dict(t=0, b=0, l=0, r=0),
    template="plotly_white",
)

# Update 3D scene options
fig.update_scenes(
    aspectratio=dict(x=1, y=1, z=0.7),
    aspectmode="manual"
)

# Add dropdown
fig.update_layout(
    updatemenus=[
        dict(
            type = "buttons",
            direction = "left",
            buttons=list([
                dict(
                    args=["type", "surface"],
                    label="3D Surface",
                    method="restyle"
                ),
                dict(
                    args=["type", "heatmap"],
                    label="Heatmap",
                    method="restyle"
                )
            ]),
            pad={"r": 10, "t": 10},
            showactive=True,
            x=0.11,
            xanchor="left",
            y=1.1,
            yanchor="top"
        ),
    ]
)

# Add annotation
fig.update_layout(
    annotations=[
        dict(text="Trace type:", showarrow=False,
                             x=0, y=1.08, yref="paper", align="left")
    ]
)

fig.show()
```



Update Several Data Attributes

This example demonstrates how to update several data attributes: colorscale, colorscale direction, and line display with the "restyle" method. This example uses the cmocean python package. You can install this package with `pip install cmocean`.

```python
import plotly.graph_objects as go

import pandas as pd

# load dataset
df = pd.read_csv("https://raw.githubusercontent.com/plotly/datasets/master/volcano.csv")

# Create figure
fig = go.Figure()

# Add surface trace
fig.add_trace(go.Heatmap(z=df.values.tolist(), colorscale="Viridis"))

# Update plot sizing
fig.update_layout(
    width=800,
    height=900,
    autosize=False,
    margin=dict(t=100, b=0, l=0, r=0),
)

# Update 3D scene options
fig.update_scenes(
    aspectratio=dict(x=1, y=1, z=0.7),
    aspectmode="manual"
)

# Add drowdowns
# button_layer_1_height = 1.08
button_layer_1_height = 1.12
button_layer_2_height = 1.065

fig.update_layout(
    updatemenus=[
        dict(
            buttons=list([
                dict(
                    args=["colorscale", "Viridis"],
                    label="Viridis",
                    method="restyle"
                ),
                dict(
                    args=["colorscale", "Cividis"],
                    label="Cividis",
                    method="restyle"
                ),
                dict(
                    args=["colorscale", "Blues"],
                    label="Blues",
                    method="restyle"
                ),
                dict(
                    args=["colorscale", "Greens"],
                    label="Greens",
                    method="restyle"
                ),
            ]),
            type = "buttons",
            direction="right",
            pad={"r": 10, "t": 10},
            showactive=True,
            x=0.1,
            xanchor="left",
            y=button_layer_1_height,
            yanchor="top"
        ),
        dict(
            buttons=list([
                dict(
                    args=["reversescale", False],
                    label="False",
                    method="restyle"
                ),
                dict(
                    args=["reversescale", True],
                    label="True",
                    method="restyle"
                )
            ]),
            type = "buttons",
            direction="right",
            pad={"r": 10, "t": 10},
            showactive=True,
            x=0.13,
            xanchor="left",
            y=button_layer_2_height,
            yanchor="top"
        ),
        dict(
            buttons=list([
                dict(
                    args=[{"contours.showlines": False, "type": "contour"}],
                    label="Hide lines",
                    method="restyle"
                ),
                dict(
                    args=[{"contours.showlines": True, "type": "contour"}],
                    label="Show lines",
                    method="restyle"
                ),
            ]),
            type = "buttons",
            direction="right",
            pad={"r": 10, "t": 10},
            showactive=True,
            x=0.5,
            xanchor="left",
            y=button_layer_2_height,
            yanchor="top"
        ),
    ]
)

fig.update_layout(
    annotations=[
        dict(text="colorscale", x=0, xref="paper", y=1.1, yref="paper",
                             align="left", showarrow=False),
        dict(text="Reverse<br>Colorscale", x=0, xref="paper", y=1.06,
                             yref="paper", showarrow=False),
        dict(text="Lines", x=0.47, xref="paper", y=1.045, yref="paper",
                             showarrow=False)
    ])

fig.show()
```



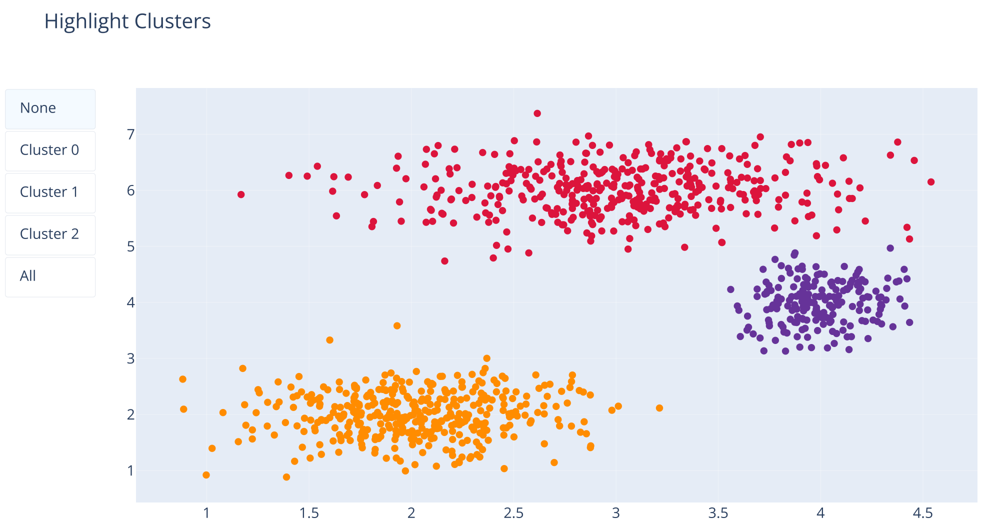
Relayout Button

The "relayout" method should be used when modifying the layout attributes of the graph.

Update One Layout Attribute

This example demonstrates how to update a layout attribute: chart type with the "relayout" method.

```python
import plotly.graph_objects as go

# Generate dataset
import numpy as np
np.random.seed(1)

x0 = np.random.normal(2, 0.4, 400)
y0 = np.random.normal(2, 0.4, 400)
x1 = np.random.normal(3, 0.6, 600)
y1 = np.random.normal(6, 0.4, 400)
x2 = np.random.normal(4, 0.2, 200)
y2 = np.random.normal(4, 0.4, 200)

# Create figure
fig = go.Figure()

# Add traces
fig.add_trace(
    go.Scatter(
        x=x0,
        y=y0,
        mode="markers",
        marker=dict(color="DarkOrange")
    )
)

fig.add_trace(
    go.Scatter(
        x=x1,
        y=y1,
        mode="markers",
        marker=dict(color="Crimson")
    )
)

fig.add_trace(
    go.Scatter(
        x=x2,
        y=y2,
        mode="markers",
        marker=dict(color="RebeccaPurple")
    )
)

# Add buttons that add shapes
cluster0 = [dict(type="circle",
                            xref="x", yref="y",
                            x0=min(x0), y0=min(y0),
                            x1=max(x0), y1=max(y0),
                            line=dict(color="DarkOrange"))]
cluster1 = [dict(type="circle",
                            xref="x", yref="y",
                            x0=min(x1), y0=min(y1),
                            x1=max(x1), y1=max(y1),
                            line=dict(color="Crimson"))]
cluster2 = [dict(type="circle",
                            xref="x", yref="y",
                            x0=min(x2), y0=min(y2),
                            x1=max(x2), y1=max(y2),
                            line=dict(color="RebeccaPurple"))]

fig.update_layout(
    updatemenus=[
        dict(
            type="buttons",
            buttons=[
                dict(label="None",
                     method="relayout",
                     args=["shapes", []]),
                dict(label="Cluster 0",
                     method="relayout",
                     args=["shapes", cluster0]),
                dict(label="Cluster 1",
                     method="relayout",
                     args=["shapes", cluster1]),
                dict(label="Cluster 2",
                     method="relayout",
                     args=["shapes", cluster2]),
                dict(label="All",
                     method="relayout",
                     args=["shapes", cluster0 + cluster1 + cluster2])
            ],
        )
    ]
)

# Update remaining layout properties
fig.update_layout(
    title_text="Highlight Clusters",
    showlegend=False,
)

fig.show()
```

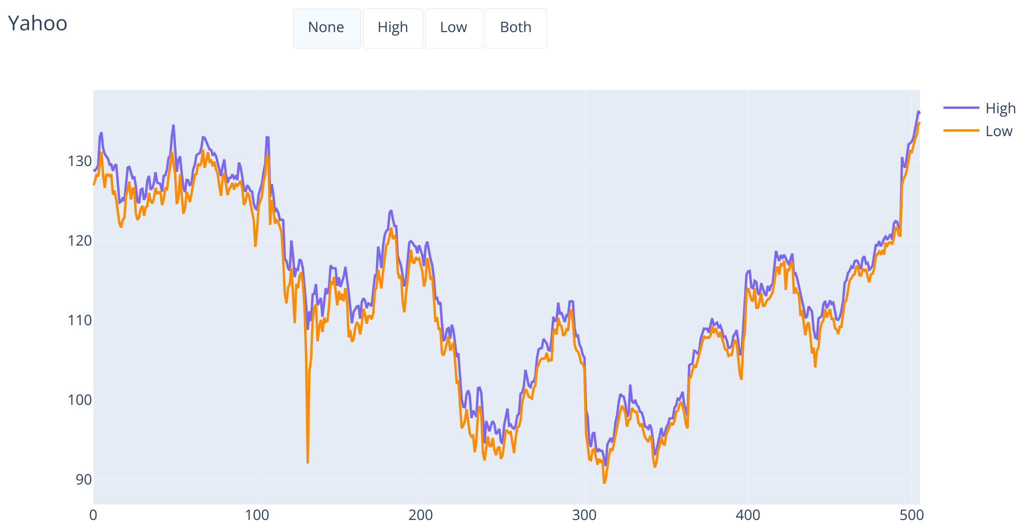


Update Button

The "update" method should be used when modifying the data and layout sections of the graph.

This example demonstrates how to update which traces are displayed while simultaneously updating layout attributes such as the chart title and annotations.

```python
import plotly.graph_objects as go

import pandas as pd

# Load dataset
df = pd.read_csv(
    "https://raw.githubusercontent.com/plotly/datasets/master/finance-charts-apple.csv")
df.columns = [col.replace("AAPL.", "") for col in df.columns]

# Initialize figure
fig = go.Figure()

# Add Traces

fig.add_trace(
    go.Scatter(x=list(df.index),
               y=list(df.High),
               name="High",
               line=dict(color="MediumSlateBlue")))

fig.add_trace(
    go.Scatter(x=list(df.index),
               y=[df.High.mean()] * len(df.index),
               name="High Average",
               visible=False,
               line=dict(color="MediumSlateBlue", dash="dash")))

fig.add_trace(
    go.Scatter(x=list(df.index),
               y=list(df.Low),
               name="Low",
               line=dict(color="DarkOrange")))

fig.add_trace(
    go.Scatter(x=list(df.index),
               y=[df.Low.mean()] * len(df.index),
               name="Low Average",
               visible=False,
               line=dict(color="DarkOrange", dash="dash")))

# Add Annotations and Buttons
high_annotations = [dict(x=-0.05,
                         y=df.High.mean(),
                         xanchor="right",
                         yanchor="bottom",
                         xref="x domain",
                         yref="y",
                         text="High Avg:<br> %.2f" % df.High.mean(),
                         showarrow=False),
                    dict(x=df.High.idxmax(),
                         y=df.High.max(),
                         xref="x",
                         yref="y",
                         text="High Max:<br> %.2f" % df.High.max(),
                         ax=0, ay=-40)]
low_annotations = [dict(x=-0.05,
                        y=df.Low.mean(),
                        xanchor="right",
                        yanchor="top",
                        xref="x domain",
                        yref="y",
                        text="Low Avg:<br> %.2f" % df.Low.mean(),
                        showarrow=False),
                   dict(x=df.Low.idxmin(),
                        y=df.Low.min(),
                        xref="x",
                        yref="y",
                        text="Low Min:<br> %.2f" % df.Low.min(),
                        ax=0, ay=40)]

fig.update_layout(
    updatemenus=[
        dict(
            type="buttons",
            direction="right",
            active=0,
            x=0.57,
            y=1.2,
            buttons=list([
                dict(label="None",
                     method="update",
                     args=[{"visible": [True, False, True, False]},
                           {"title": "Yahoo",
                            "annotations": []}]),
                dict(label="High",
                     method="update",
                     args=[{"visible": [True, True, False, False]},
                           {"title": "Yahoo High",
                            "annotations": high_annotations}]),
                dict(label="Low",
                     method="update",
                     args=[{"visible": [False, False, True, True]},
                           {"title": "Yahoo Low",
                            "annotations": low_annotations}]),
                dict(label="Both",
                     method="update",
                     args=[{"visible": [True, True, True, True]},
                           {"title": "Yahoo",
                            "annotations": high_annotations + low_annotations}]),
            ]),
        )
    ])

# Set title
fig.update_layout(
    title_text="Yahoo",
    xaxis_domain=[0.05, 1.0]
)

fig.show()
```



Animate Button

Refer to our animation docs: https://plotly.com/python/#animations (https://plotly.com/python/#animations) for examples on how to use the animate method with Plotly buttons.

Reference

See https://plotly.com/python/reference/layout/updatemenus/ (https://plotly.com/python/reference/layout/updatemenus/) for more information about updatemenu buttons.

What About Dash?

Dash (https://dash.plot.ly/) is an open-source framework for building analytical applications, with no Javascript required, and it is tightly integrated with the Plotly graphing library.

Learn about how to install Dash at https://dash.plot.ly/installation (https://dash.plot.ly/installation).

Everywhere in this page that you see fig.show(), you can display the same figure in a Dash application by passing it to the figure argument of the Graph component (https://dash.plot.ly/dash-core-components/graph) from the built-in dash_core_components package like this:

```python
import plotly.graph_objects as go # or plotly.express as px
fig = go.Figure() # or any Plotly Express function e.g. px.bar(...)
# fig.add_trace( ... )
# fig.update_layout( ... )

from dash import Dash, dcc, html

app = Dash()
app.layout = html.Div([
    dcc.Graph(figure=fig)
])

app.run(debug=True, use_reloader=False)  # Turn off reloader if inside Jupyter
```

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country	pop	continent	lifeExp	gdpPercap
Afghanistan	31889923	Asia	43.828	974.5803384
Albania	3600523	Europe	76.423	5937.029525999999
Algeria	33333216	Africa	72.301	6223.367465
Angola	12420476	Africa	42.731	4797.231267
Argentina	40301927	Americas	75.32	12779.37964
Australia	20434176	Oceania	81.235	34435.367439999995
Austria	8199783	Europe	79.829	36126.4927
Bahrain	708573	Asia	75.635	29796.04834
Bangladesh	150448339	Asia	64.062	1391.253792
Belgium	10392226	Europe	79.441	33692.60508
Benin	8078314	Africa	56.728	1441.284873
Bolivia	9119152	Americas	65.554	3822.137084

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(https://dash.plotly.com/tutorial?utm_medium=graphing_libraries&utm_content=python_footer)