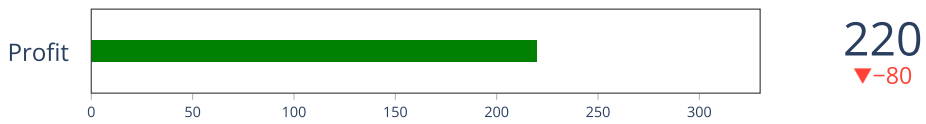
Bullet Charts in Python

How to make bullet charts in Python with Plotly.

Basic Bullet Charts

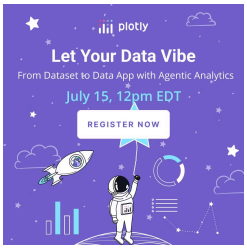
Stephen Few's Bullet Chart was invented to replace dashboard gauges (https://plotly.com/python/gauge-charts/) and meters, combining both types of charts into simple bar charts with qualitative bars (steps), quantitative bar (bar) and performance line (threshold); all into one simple layout. Steps typically are broken into several values, which are defined with an array. The bar represent the actual value that a particular variable reached, and the threshold usually indicate a goal point relative to the value achieved by the bar. See indicator page (https://plotly.com/python/gauge-charts/) for more detail.

```
import plotly.graph_objects as go

fig = go.Figure(go.Indicator(
    mode = "number+gauge+delta",
    gauge = {'shape': "bullet"},
    value = 220,
    delta = {'reference': 300},
    domain = {'x': [0, 1], 'y': [0, 1]},
    title = {'text': "Profit"}))
fig.update_layout(height = 250)

fig.show()
```

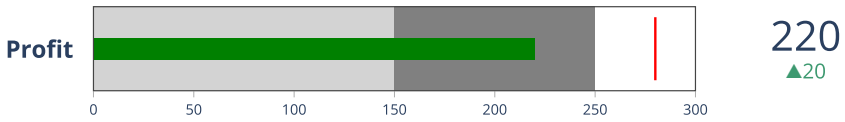


Add Steps, and Threshold

Below is the same example using "steps" attribute, which is shown as shading, and "threshold" to determine boundaries that visually alert you if the value cross a defined threshold.



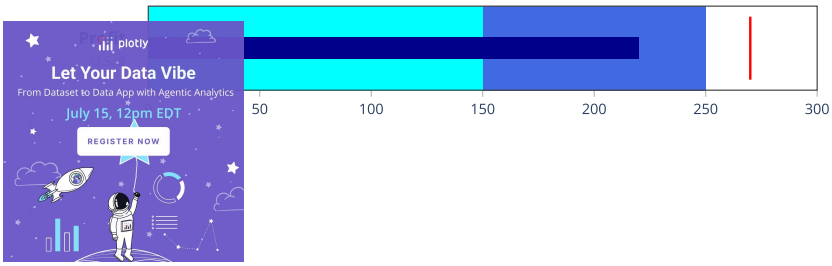
```
import plotly.graph_objects as go

fig = go.Figure(go.Indicator(
    mode = "number+gauge+delta", value = 220,
    domain = {'x': [0.1, 1], 'y': [0, 1]},
    title = {'text' :"<b>Profit</b>"},
    delta = {'reference': 200},
    gauge = {
        'shape': "bullet",
        'axis': {'range': [None, 300]},
        'threshold': {
            'line': {'color': "red", 'width': 2},
            'thickness': 0.75,
            'value': 280},
        'steps': [
            {'range': [0, 150], 'color': "lightgray"},
            {'range': [150, 250], 'color': "gray"}]}))
fig.update_layout(height = 250)
fig.show()
```



Custom Bullet

The following example shows how to customize your charts. For more information about all possible options check our reference page (https://plotly.com/python/reference/indicator/).

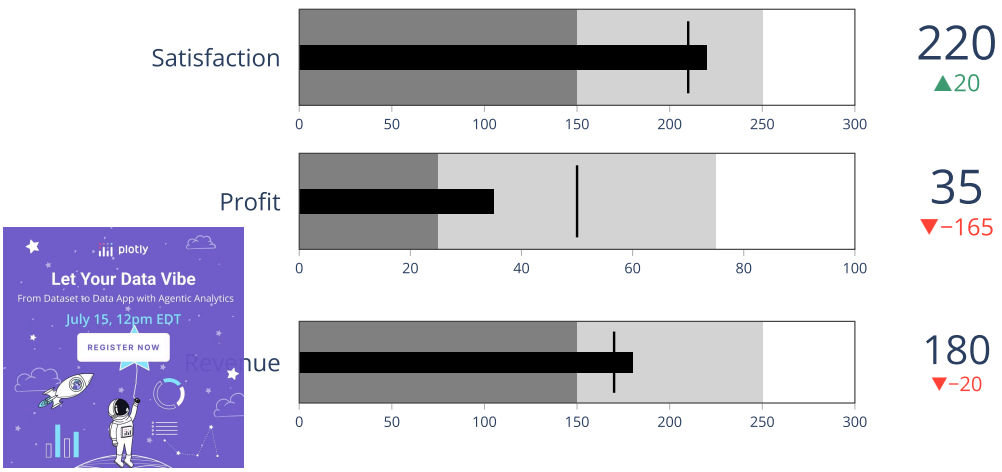
```
import plotly.graph_objects as go

fig = go.Figure(go.Indicator(
    mode = "number+gauge+delta", value = 220,
    domain = {'x': [0, 1], 'y': [0, 1]},
    delta = {'reference': 280, 'position': "top"},
    title = {'text':"<b>Profit</b><br><span style='color: gray; font-size:0.8em'>U.S. $</span>", 'font': {"size": 14}},
    gauge = {
        'shape': "bullet",
        'axis': {'range': [None, 300]},
        'threshold': {
            'line': {'color': "red", 'width': 2},
            'thickness': 0.75, 'value': 270},
        'bgcolor': "white",
        'steps': [
            {'range': [0, 150], 'color': "cyan"},
            {'range': [150, 250], 'color': "royalblue"}],
        'bar': {'color': "darkblue"}}))
fig.update_layout(height = 250)
fig.show()
```



Multi Bullet

Bullet charts can be stacked for comparing several values at once as illustrated below:

```
import plotly.graph_objects as go

fig = go.Figure()

fig.add_trace(go.Indicator(
    mode = "number+gauge+delta", value = 180,
    delta = {'reference': 200},
    domain = {'x': [0.25, 1], 'y': [0.08, 0.25]},
    title = {'text': "Revenue"},
    gauge = {
        'shape': "bullet",
        'axis': {'range': [None, 300]},
        'threshold': {
            'line': {'color': "black", 'width': 2},
            'thickness': 0.75,
            'value': 170},
        'steps': [
            {'range': [0, 150], 'color': "gray"},
            {'range': [150, 250], 'color': "lightgray"}],
        'bar': {'color': "black"}}))

fig.add_trace(go.Indicator(
    mode = "number+gauge+delta", value = 35,
    delta = {'reference': 200},
    domain = {'x': [0.25, 1], 'y': [0.4, 0.6]},
    title = {'text': "Profit"},
    gauge = {
        'shape': "bullet",
        'axis': {'range': [None, 100]},
        'threshold': {
            'line': {'color': "black", 'width': 2},
            'thickness': 0.75,
            'value': 50},
        'steps': [
            {'range': [0, 25], 'color': "gray"},
            {'range': [25, 75], 'color': "lightgray"}],
        'bar': {'color': "black"}}))

fig.add_trace(go.Indicator(
    mode = "number+gauge+delta", value = 220,
    delta = {'reference': 200},
    domain = {'x': [0.25, 1], 'y': [0.7, 0.9]},
    title = {'text' :"Satisfaction"},
    gauge = {
        'shape': "bullet",
        'axis': {'range': [None, 300]},
        'threshold': {
            'line': {'color': "black", 'width': 2},
            'thickness': 0.75,
            'value': 210},
        'steps': [
            {'range': [0, 150], 'color': "gray"},
            {'range': [150, 250], 'color': "lightgray"}],
        'bar': {'color': "black"}}))
fig.update_layout(height = 400 , margin = {'t':0, 'b':0, 'l':0})

fig.show()
```



Reference

See https://plotly.com/python/reference/indicator/ (https://plotly.com/python/reference/indicator/) for more information and chart attribute options!

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:

```
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
```