Scatter Plots in Python

How to make scatter plots in Python with Plotly.

Scala MATLAB R Python Pandas

plotly.js node.js matplotlib

New to Plotly?

Plotly's Python library is free and open source! Get started by downloading the client and reading the primer.

You can set up Plotly to work in online or offline mode, or in jupyter notebooks.

We also have a quick-reference cheatsheet (new!) to help you get started!

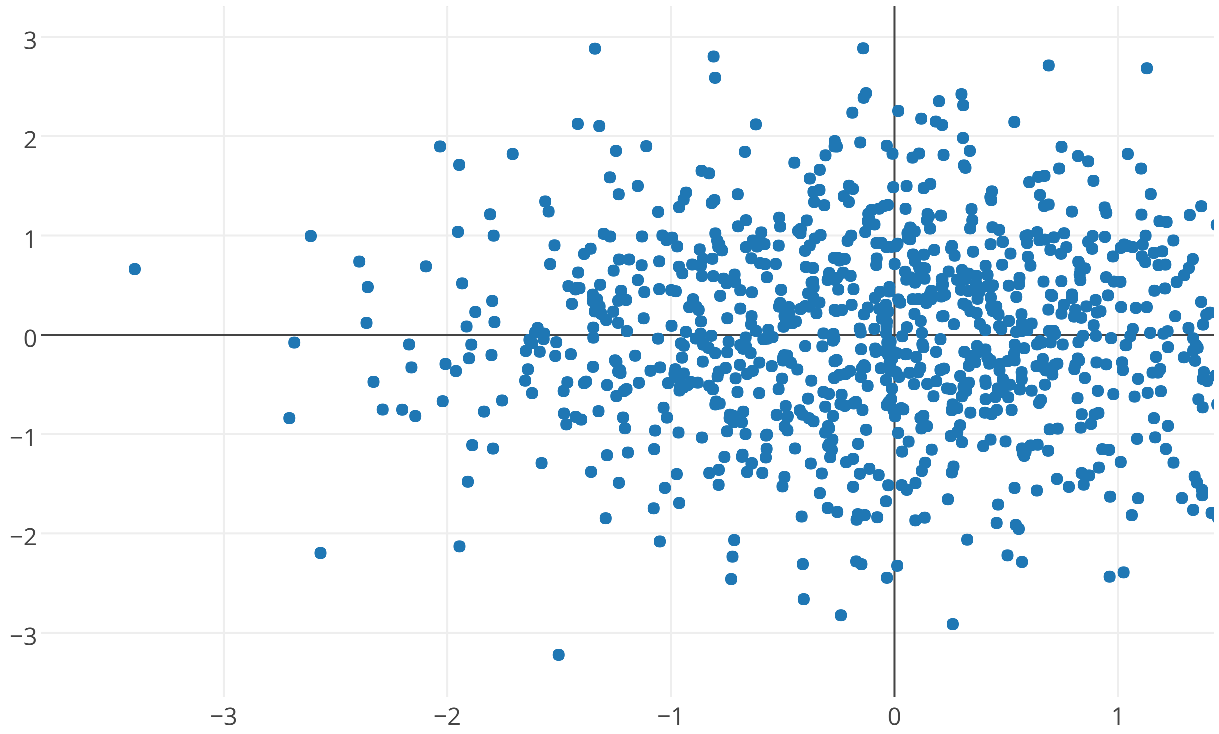
Simple Scatter Plot

In [1]:

Copy to clipboard!

```
import plotly.plotly as py
import plotly.graph_objs as go

# Create random data with numpy
import numpy as np

N = 1000
random_x = np.random.randn(N)
random_y = np.random.randn(N)

# Create a trace
trace = go.Scatter(
    x = random_x,
    y = random_y,
    mode = 'markers'
)

data = [trace]

# Plot and embed in ipython notebook!
py.iplot(data, filename='basic-scatter')

# or plot with: plot_url = py.plot(data, filename='basic-line')
```

Out[1]:



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Line and Scatter Plots

```
In [2]:
```

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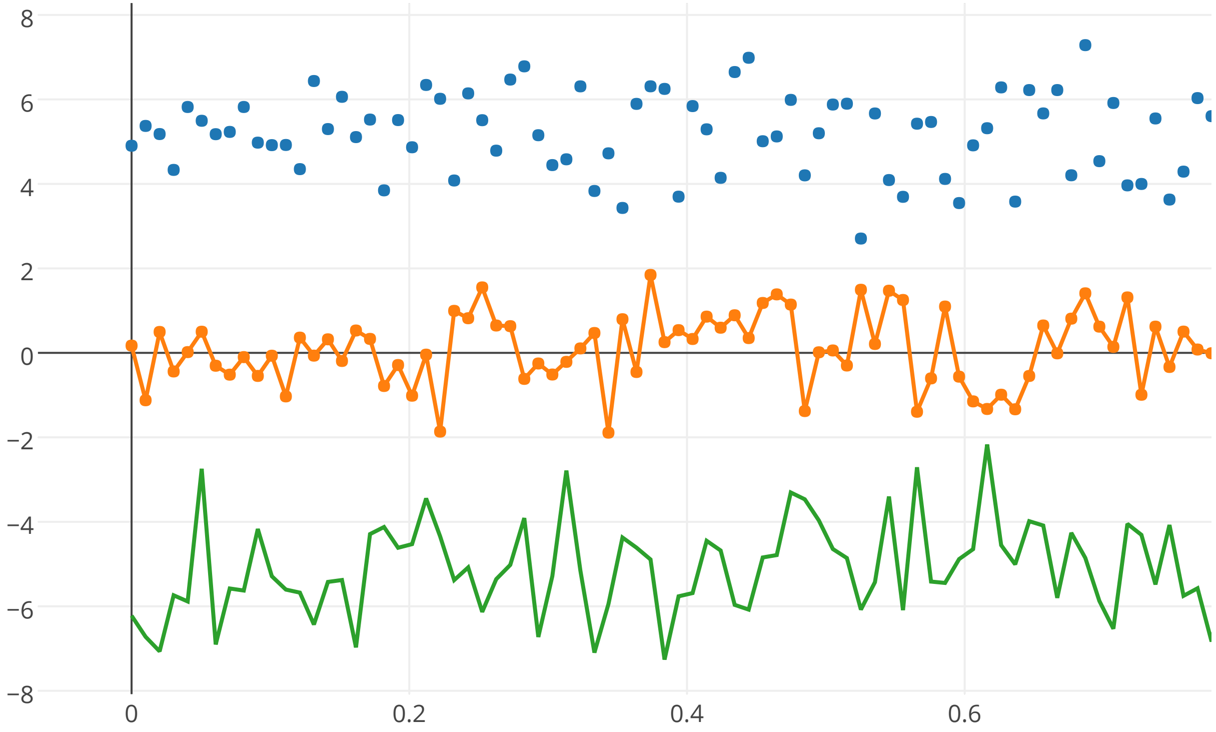
```
import plotly.plotly as py
import plotly.graph_objs as go

# Create random data with numpy
import numpy as np

N = 100
random_x = np.linspace(0, 1, N)
random_y0 = np.random.randn(N)+5
random_y1 = np.random.randn(N)
random_y2 = np.random.randn(N)-5

# Create traces
trace0 = go.Scatter(
    x = random_x,
    y = random_y0,
    mode = 'markers',
    name = 'markers'
)
trace1 = go.Scatter(
    x = random_x,
    y = random_y1,
    mode = 'lines+markers',
    name = 'lines+markers'
)
trace2 = go.Scatter(
    x = random_x,
    y = random_y2,
    mode = 'lines',
    name = 'lines'
)
```

```
data = [trace0, trace1, trace2]
py.iplot(data, filename='scatter-mode')
```

Out[2]:



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Style Scatter Plots

In [3]:

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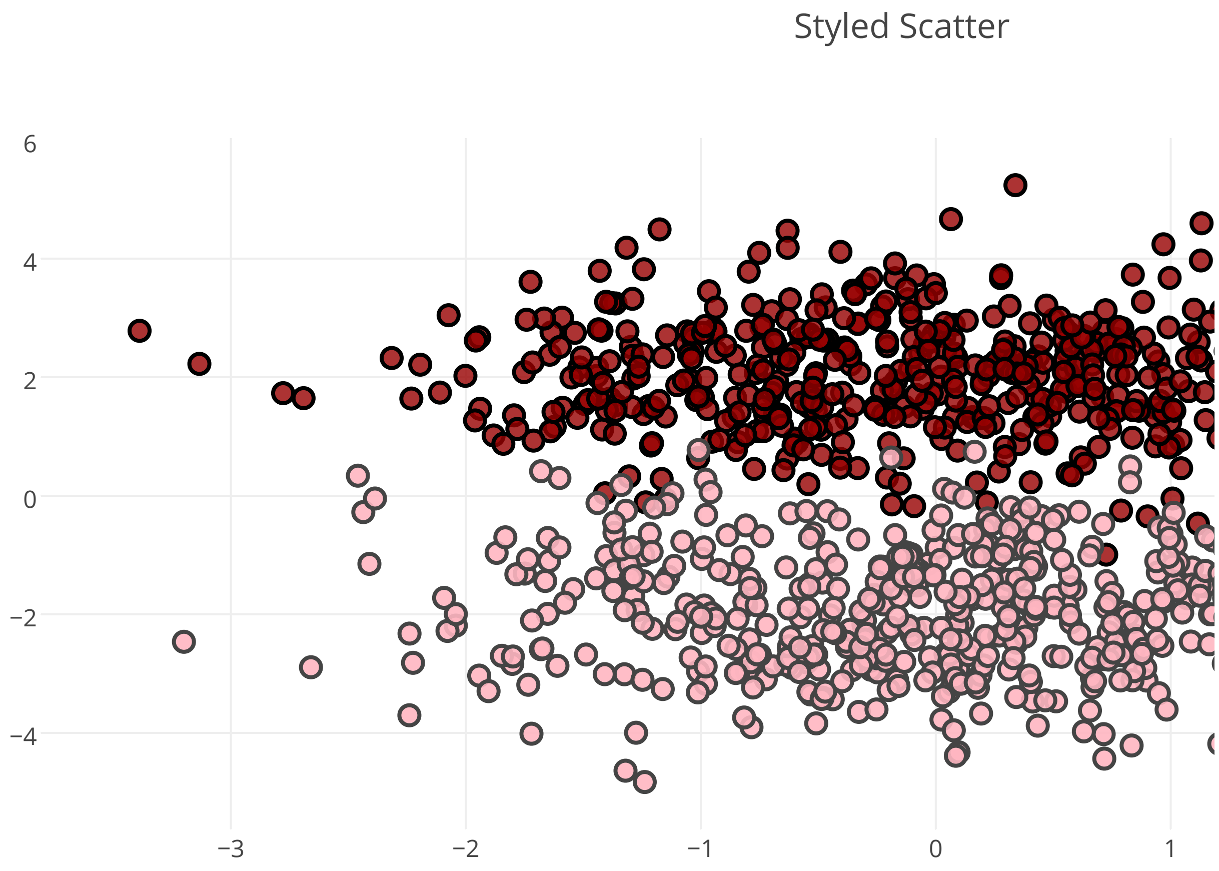
```
import plotly.plotly as py
import plotly.graph_objs as go

import numpy as np

N = 500

trace0 = go.Scatter(
    x = np.random.randn(N),
    y = np.random.randn(N)+2,
    name = 'Above',
    mode = 'markers',
    marker = dict(
        size = 10,
        color = 'rgba(152, 0, 0, .8)',
        line = dict(
            width = 2,
            color = 'rgb(0, 0, 0)'
        )
    )
)

trace1 = go.Scatter(
    x = np.random.randn(N),
    y = np.random.randn(N)-2,
    name = 'Below',
    mode = 'markers',
    marker = dict(
        size = 10,
        color = 'rgba(255, 182, 193, .9)',
        line = dict(
            width = 2,
        )
    )
)

data = [trace0, trace1]

layout = dict(title = 'Styled Scatter',
              yaxis = dict(zeroline = False),
              xaxis = dict(zeroline = False)
             )

fig = dict(data=data, layout=layout)
py.iplot(fig, filename='styled-scatter')
```

Out[3]:



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```python
import plotly.plotly as py
import plotly.graph_objs as go
import random
import numpy as np
import pandas as pd

l= []
y= []
data= pd.read_csv("https://raw.githubusercontent.com/plotly/datasets/master/2014_usa_states.csv")
# Setting colors for plot.
N= 53
c= ['hsl('+str(h)+',50%'+',50%)' for h in np.linspace(0, 360, N)]

for i in range(int(N)):
    y.append((2000+i))
    trace0= go.Scatter(
        x= data['rank'],
        y= data['pop']+(i*1000000),
        mode= 'markers',
        marker= dict(size= 14,
                    line= dict(width=1),
                    color= c[i],
                    opacity= 0.3
                   ),name= y[i],
        text= data['state']) # The hover text goes here...
    l.append(trace0);
```

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```
        ticklen= 5,
        zeroline= False,
        gridwidth= 2,
    ),
    yaxis=dict(
        title= 'Rank',
        ticklen= 5,
        gridwidth= 2,
    ),
    showlegend= False
)
fig= go.Figure(data=l, layout=layout)
py.iplot(fig)
```

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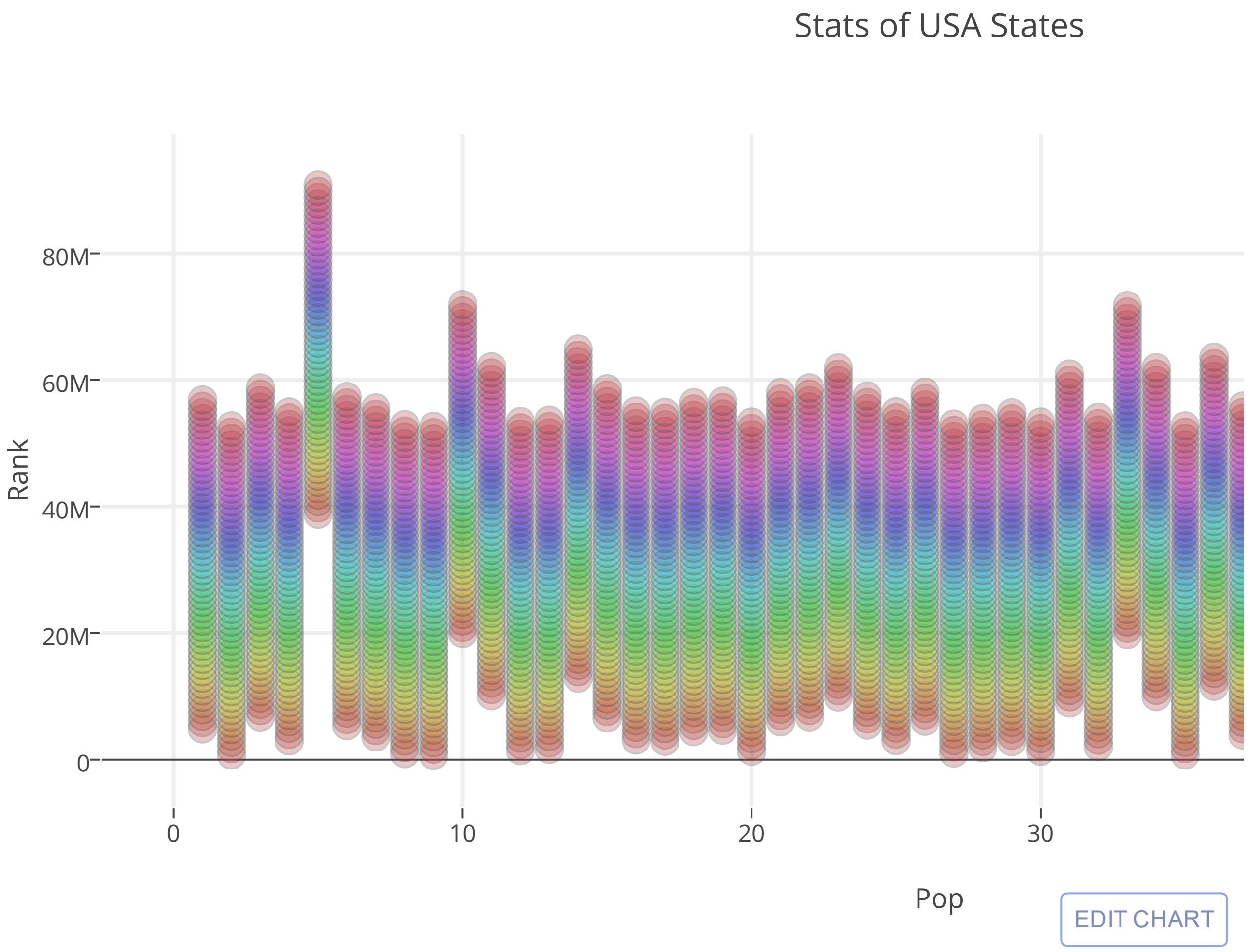
```
Out[4]:
```



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In [5]:

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```
import plotly.graph_objs as go
import plotly.plotly as py

import numpy as np

trace1 = go.Scatter(
    y = np.random.randn(500),
    mode='markers',
    marker=dict(
        size='16',
        color = np.random.randn(500), #set color equal to a variable
        colorscale='Viridis',
        showscale=True
    )
)
data = [trace1]

py.iplot(data, filename='scatter-plot-with-colorscale')
```

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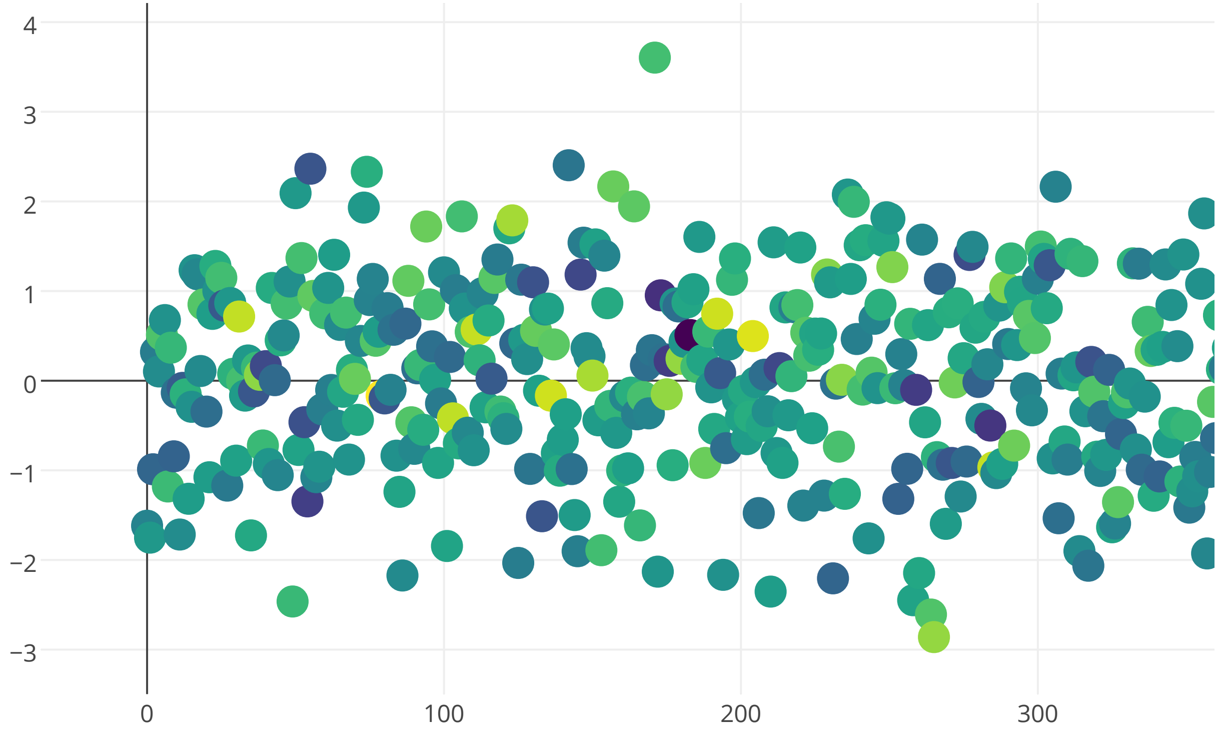
Out[5]:



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```
import plotly.plotly as py
import plotly.graph_objs as go

country = ['Switzerland (2011)', 'Chile (2013)', 'Japan (2014)', 'United States (2012)', 'Slovenia (2014)', 'Canada (2011)', 'Poland (2010)', 'Estonia (2015)', 'Luxembourg (2013)', 'Portugal (2011)']
voting_pop = [40, 45.7, 52, 53.6, 54.1, 54.2, 54.5, 54.7, 55.1, 56.6]
reg_voters = [49.1, 42, 52.7, 84.3, 51.7, 61.1, 55.3, 64.2, 91.1, 58.9]

trace0 = go.Scatter(
    x=voting_pop,
    y=country,
    mode='markers',
    name='Percent of estimated voting age population',
    marker=dict(
        color='rgba(156, 165, 196, 0.95)',
        line=dict(
            color='rgba(156, 165, 196, 1.0)',
            width=1,
        ),
        symbol='circle',
        size=16,
    )
)
trace1 = go.Scatter(
    x=reg_voters,
    y=country,
```

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```
            width=1,
        ),
        symbol='circle',
        size=16,
    )
)
data = [trace0, trace1]
layout = go.Layout(
    title="Votes cast for ten lowest voting age population in OECD countries",
    xaxis=dict(
        showgrid=False,
        showline=True,
        linecolor='rgb(102, 102, 102)',
        titlefont=dict(
            color='rgb(204, 204, 204)'
        ),
        tickfont=dict(
            color='rgb(102, 102, 102)',
        ),
        autotick=False,
        dtick=10,
        ticks='outside',
        tickcolor='rgb(102, 102, 102)',
    ),
    margin=dict(
        l=140,
        r=40,
        b=50,
```

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```
        yanchor='middle',
        xanchor='right',
    ),
    width=800,
    height=600,
    paper_bgcolor='rgb(254, 247, 234)',
    plot_bgcolor='rgb(254, 247, 234)',
    hovermode='closest',
)
fig = go.Figure(data=data, layout=layout)
py.iplot(fig, filename='lowest-oecd-votes-cast')
```

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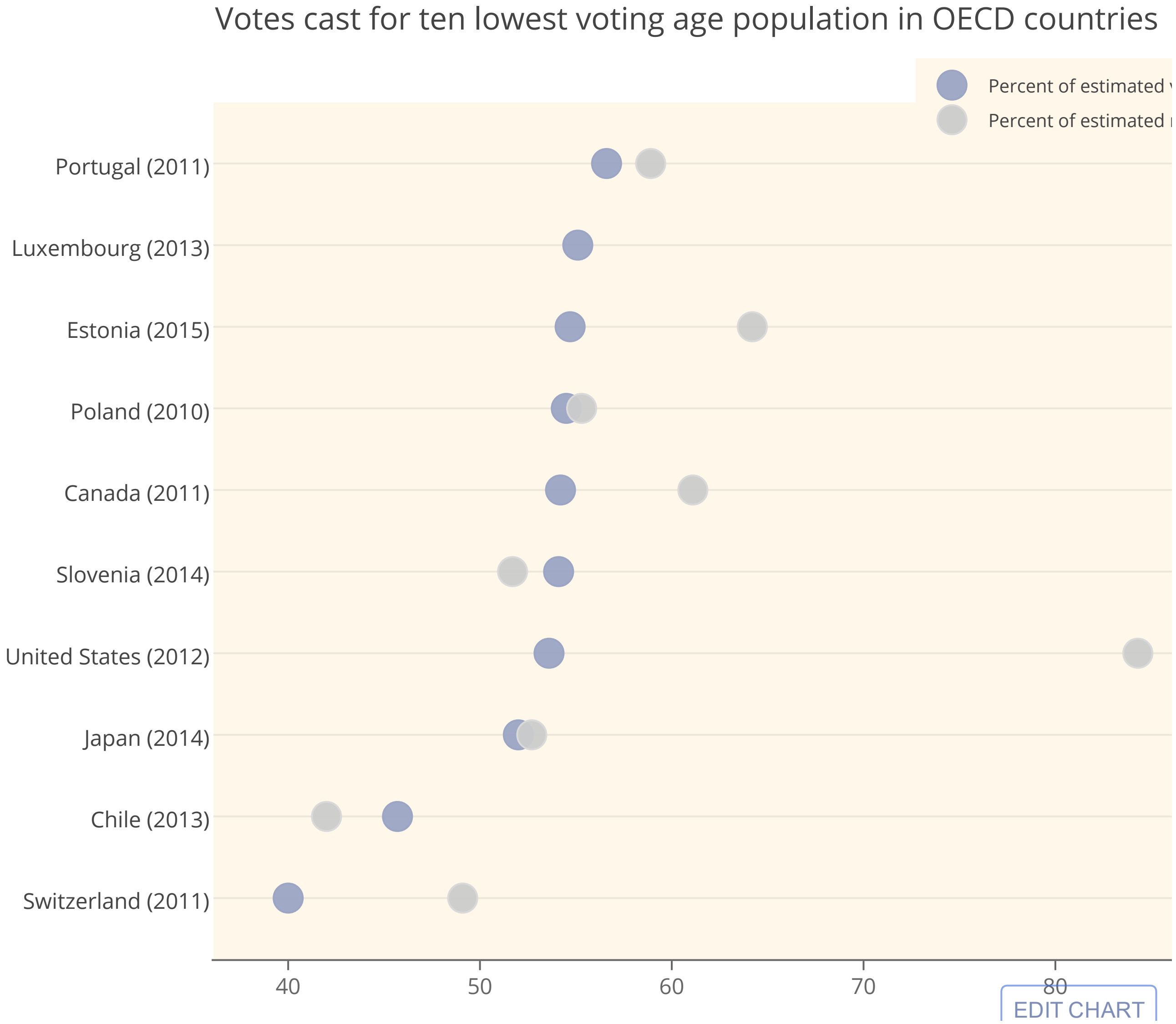
Out[6]:


Votes cast for ten lowest voting age population in OECD countries
Percent of estimated v
Percent of estimated r
Portugal (2011)
Luxembourg (2013)
Estonia (2015)
Poland (2010)
Canada (2011)
Slovenia (2014)
United States (2012)
Japan (2014)
Chile (2013)
Switzerland (2011)
40
50
60
70
80
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Large Data Sets

Now in Ploty you can implement WebGL with `Scattergl()` in place of `Scatter()` for increased speed, improved interactivity, and the ability to plot even more data!

In [7]:

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```
import plotly.plotly as py
import plotly.graph_objs as go
import numpy as np

N = 100000
trace = go.Scattergl(
    x = np.random.randn(N),
    y = np.random.randn(N),
    mode = 'markers',
    marker = dict(
        color = 'FFBAD2',
        line = dict(width = 1)
    )
)
data = [trace]
py.iplot(data, filename='compare_webgl')
```

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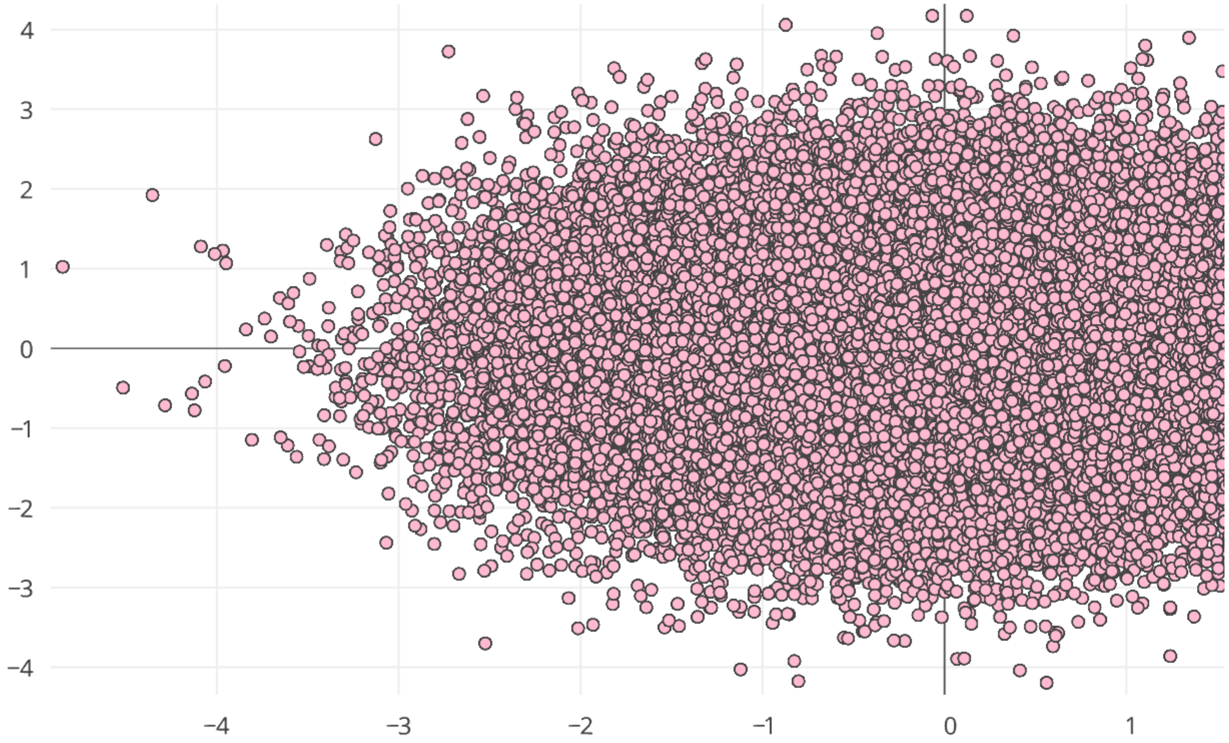
Out[7]:



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See https://plot.ly/python/reference/#scatter or https://plot.ly/python/reference/#scattergl for more information and chart attribute options!

Still need help?

Contact Us

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