Plotly and Cufflinks

Plotly is a library that allows you to create interactive plots that you can use in dashboards or websites (you can save them as html files or static images).

Installation

In order for this all to work, you'll need to install plotly and cufflinks to call plots directly off of a pandas dataframe. These libraries are not currently available through **conda** but are available through **pip**. Install the libraries at your command line/terminal using:

```
pip install plotly
pip install cufflinks
```

NOTE: Make sure you only have one installation of Python on your computer when you do this, otherwise the installation may not work.

Imports and Set-up

In [1]:
```
import pandas as pd
import numpy as np
%matplotlib inline
```

In [2]:
```
from plotly import __version__
from plotly.offline import download_plotlyjs, init_notebook_mode, plot, iplot

print(__version__) # requires version >= 1.9.0
```

5.1.0

In [3]:
```
#pip install cufflinks
```

In [4]:
```
import cufflinks as cf
```

In [5]:
```
# For Notebooks
init_notebook_mode(connected=True)
```

In [6]:
```
# For offline use
cf.go_offline()
```

Fake Data

In [7]:
```
df = pd.DataFrame(np.random.randn(100,4),columns='A B C D'.split())
```

In [8]:
```
df.head()
```

Out[8]:

	A	B	C	D
0	-0.005758	0.855622	0.287523	0.498316
1	0.635753	-1.127362	0.714455	-0.723504
2	1.207882	-0.526920	-0.263739	-0.199086
3	-0.428437	-0.805413	0.154534	-0.275439
4	1.014145	-0.749069	-2.272460	1.768593

In [9]:
```
df2 = pd.DataFrame({'Category':['A','B','C'],'Values':[32,43,50]})
```

In [10]:
```
df2.head()
```

Out[10]:

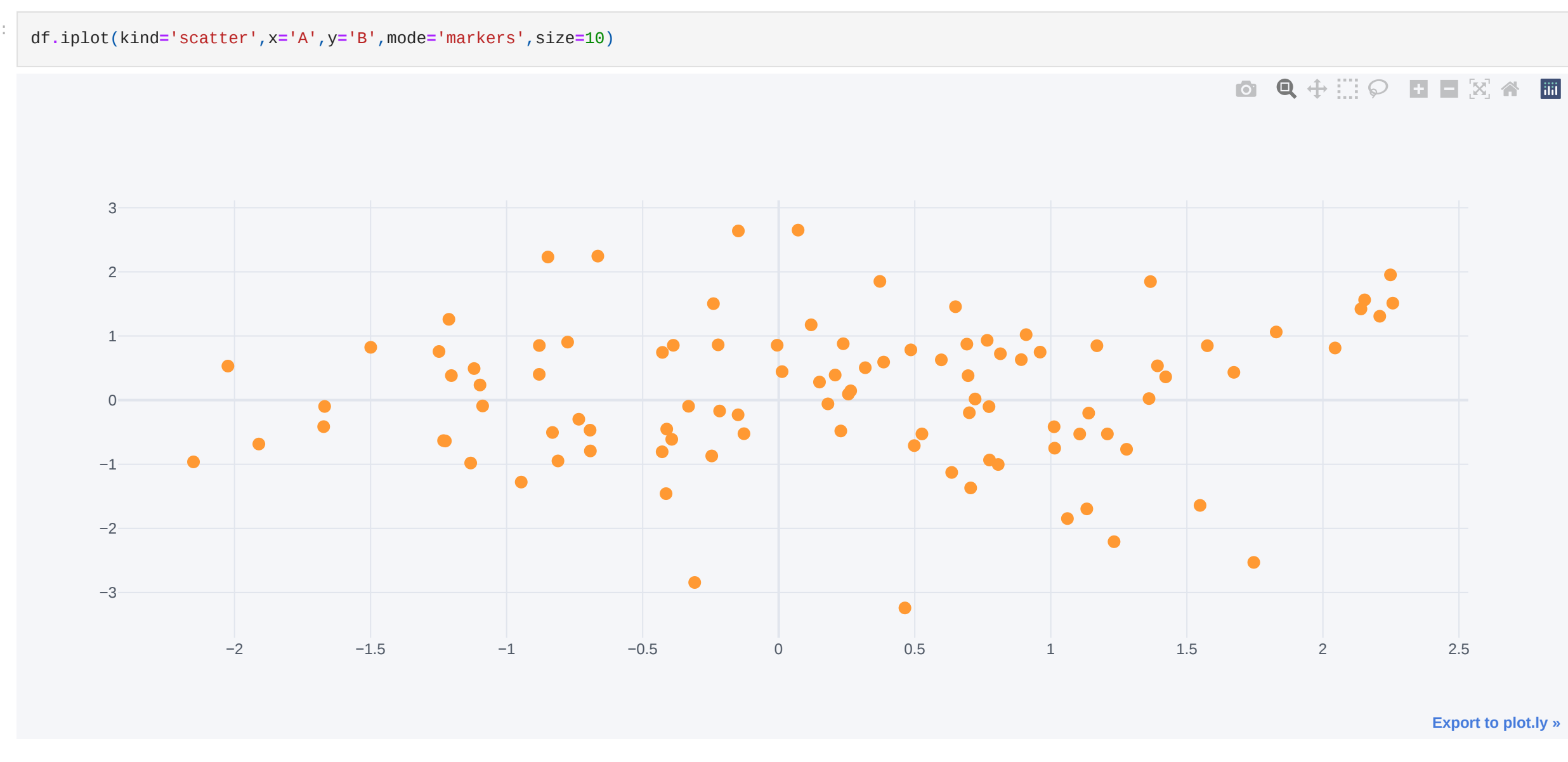
	Category	Values
0	A	32
1	B	43
2	C	50

Using Cufflinks and iplot()

- scatter
- bar
- box
- spread
- ratio
- heatmap
- surface
- histogram
- bubble

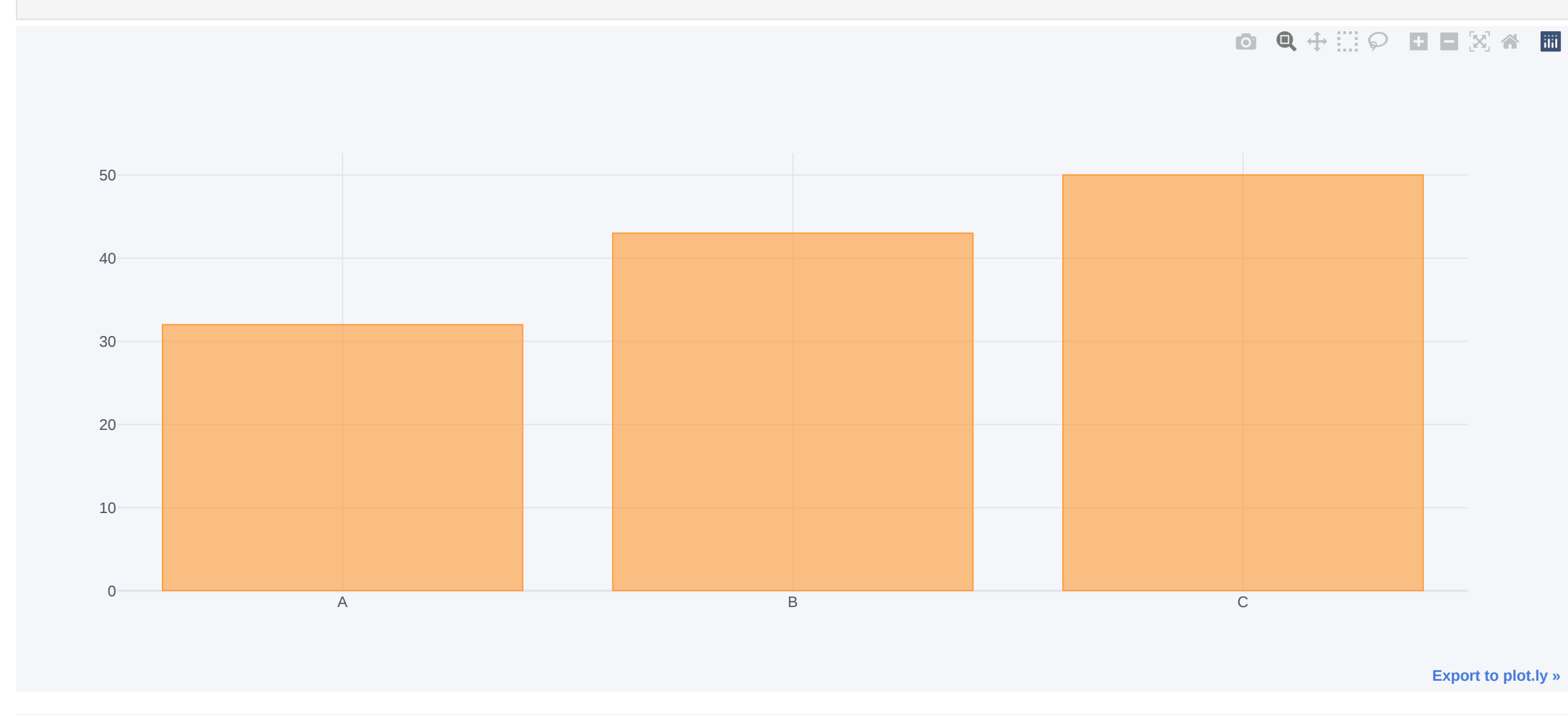
Scatter

In [11]:
```
df.iplot(kind='scatter',x='A',y='B',mode='markers',size=10)
```



Bar Plots

In [12]:
```
df2.iplot(kind='bar',x='Category',y='Values')
```



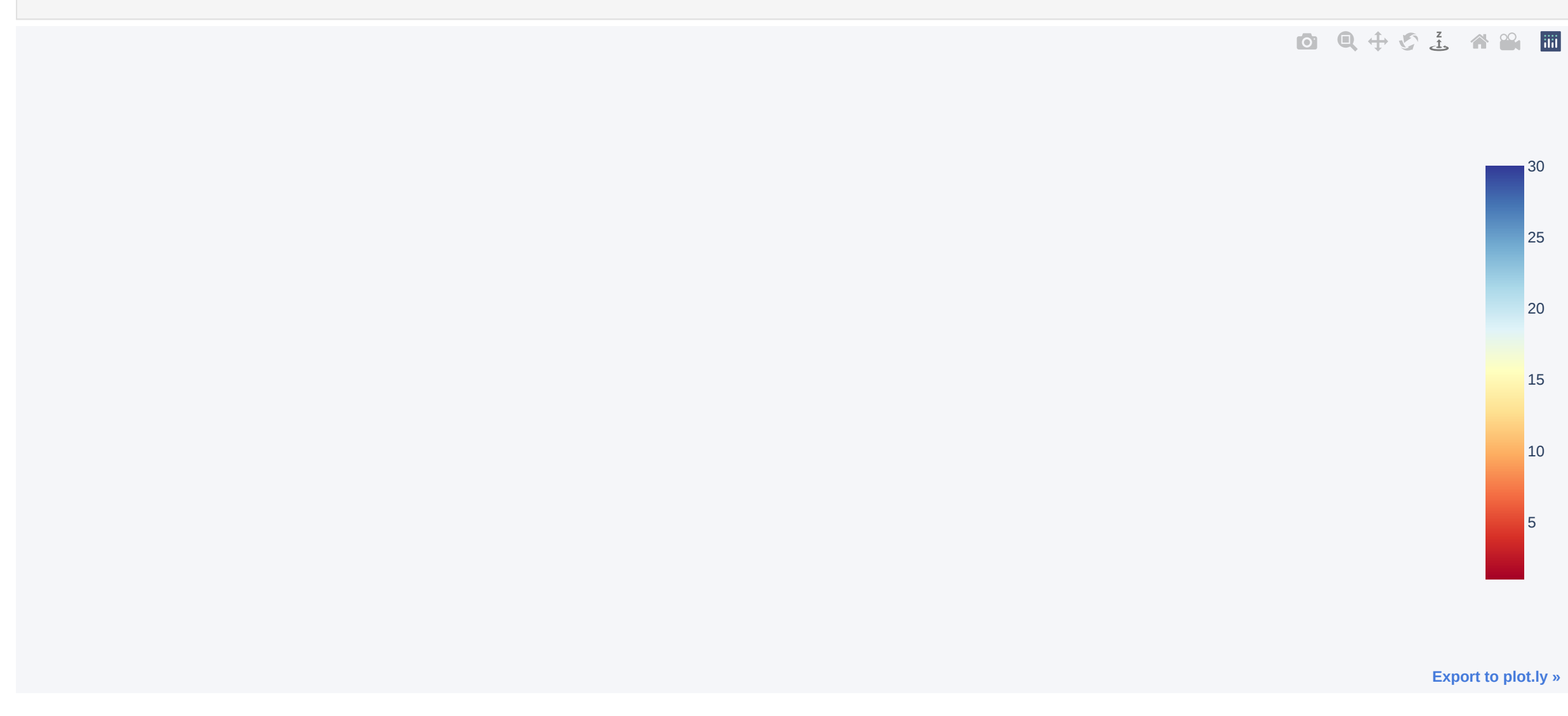
In [13]:
```
df.count().iplot(kind='bar')
```

Boxplots

In [14]:
```
df.iplot(kind='box')
```

3d Surface

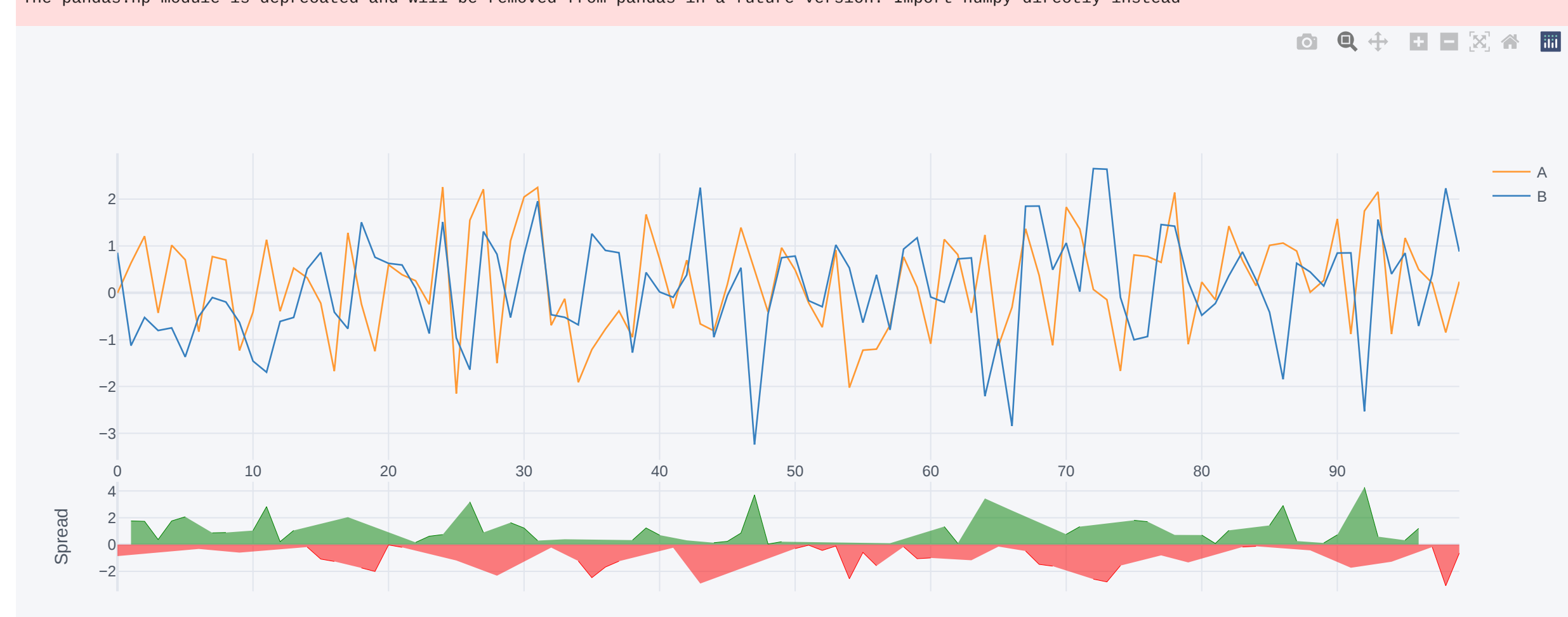
In [15]:
```
df3 = pd.DataFrame({'x':[1,2,3,4,5],'y':[10,20,30,20,10],'z':[5,4,3,2,1]})
df3.iplot(kind='surface',colorscale='rdylbu')
```



Spread

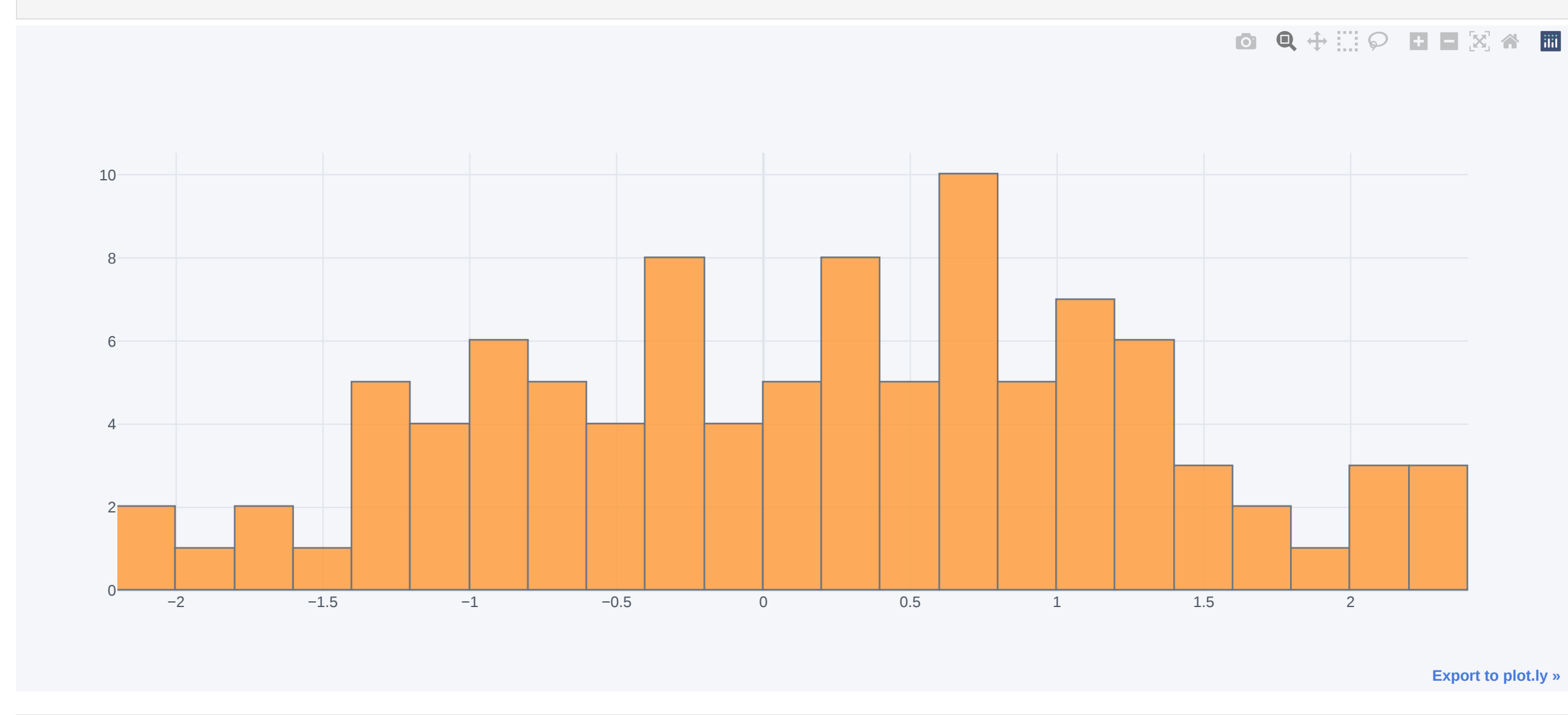
In [16]:
```
df[['A','B']].iplot(kind='spread')
```

```
C:\Users\Yasin\anaconda3\lib\site-packages\cufflinks\plotlytools.py:849: FutureWarning:

The pandas.np module is deprecated and will be removed from pandas in a future version. Import numpy directly instead

C:\Users\Yasin\anaconda3\lib\site-packages\cufflinks\plotlytools.py:850: FutureWarning:

The pandas.np module is deprecated and will be removed from pandas in a future version. Import numpy directly instead
```

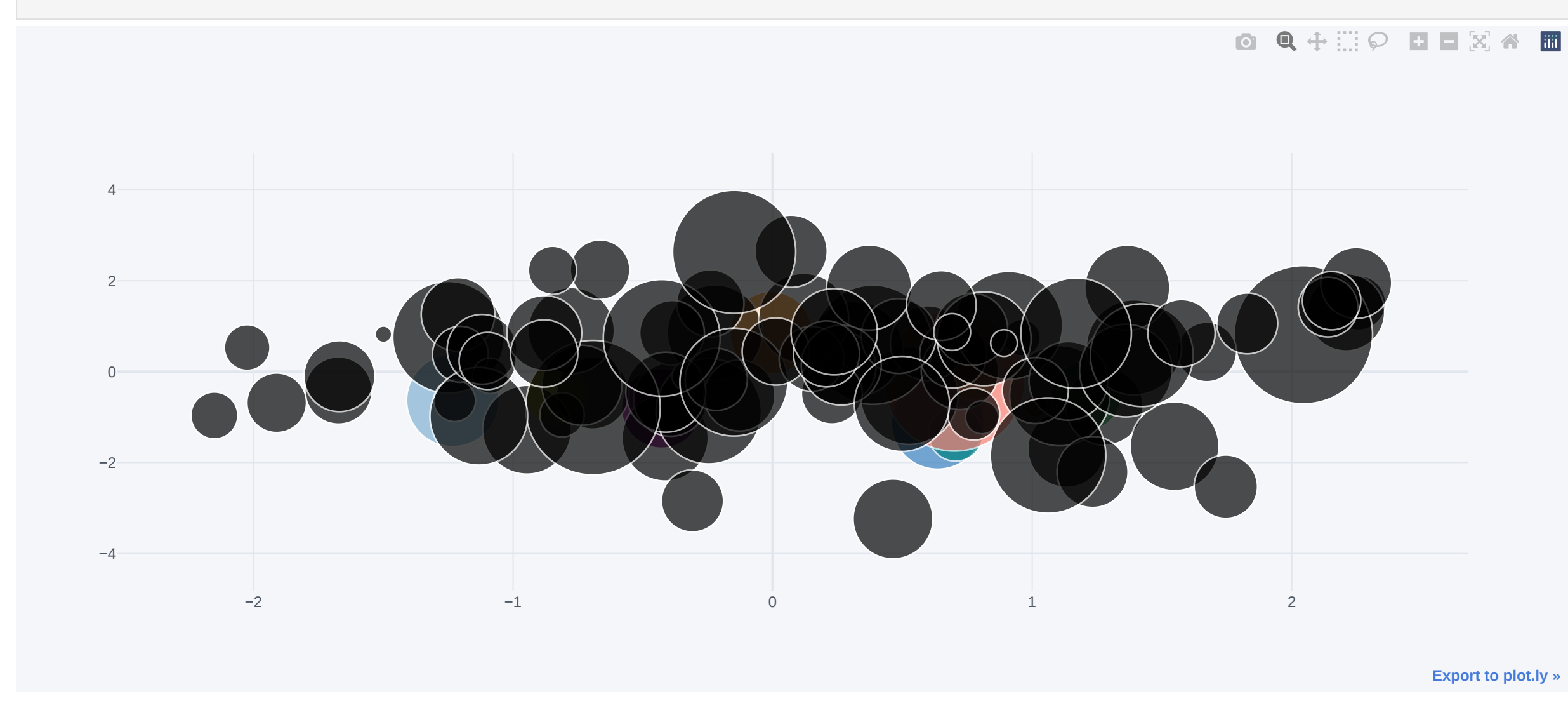


histogram

In [17]:
```
df['A'].iplot(kind='hist',bins=25)
```



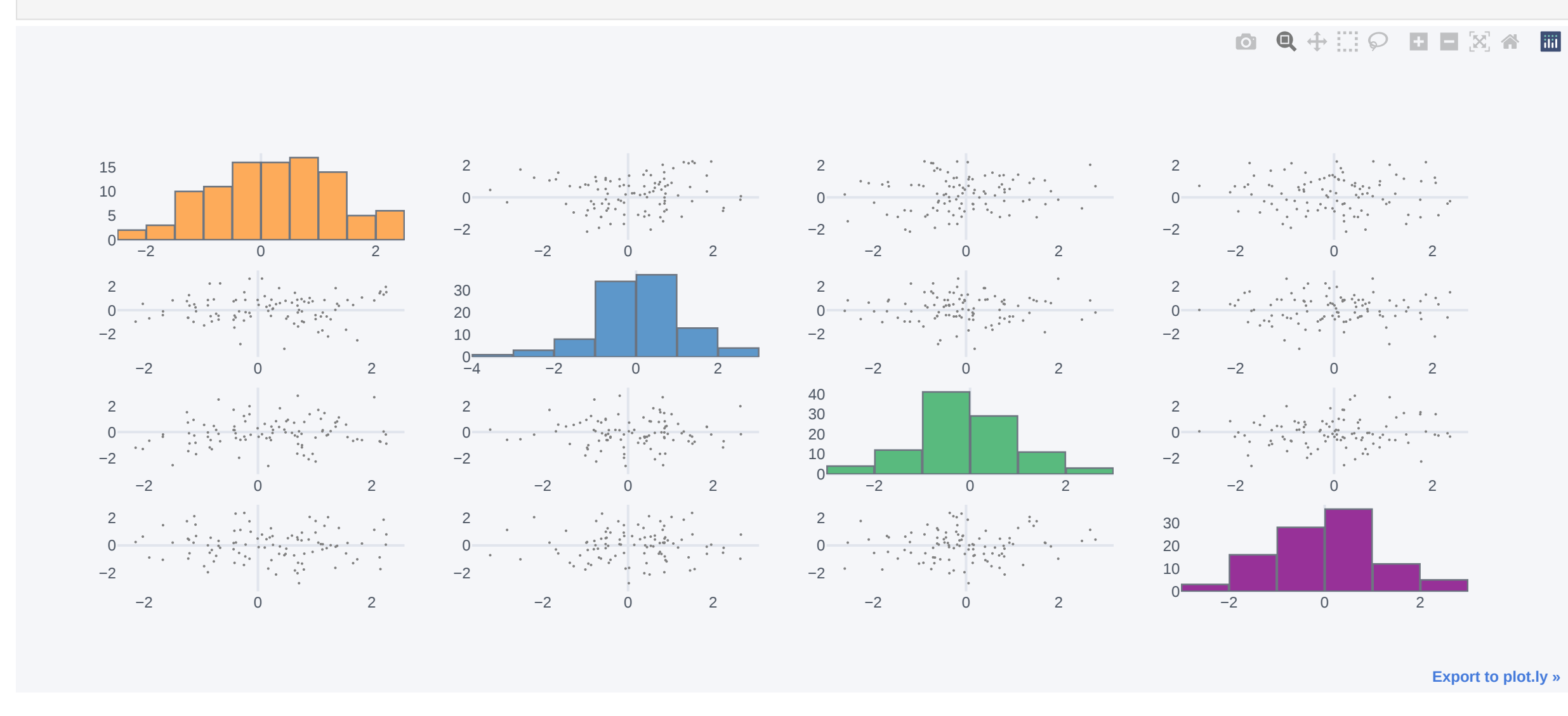
In [18]:
```
df.iplot(kind='bubble',x='A',y='B',size='C')
```



scatter_matrix()

Similar to sns.pairplot()

In [19]:
```
df.scatter_matrix()
```



Choropleth Maps (Helps to identify Global or national scale senario)

Welcome to the Choropleth Maps Exercise! In this exercise we will give you some simple datasets and ask you to create Choropleth Maps from them. Due to the Nature of Plotly we can't show you examples embedded inside the notebook.

Full Documentation Reference

Create 2 variable Data variable and Layout Variable

In [20]:
```
import chart_studio.plotly as py
import plotly.graph_objs as go
from plotly.offline import download_plotlyjs, init_notebook_mode, plot, iplot
```

Now we need to begin to build our data dictionary. Easiest way to do this is to use the **dict()** function of the general form:

- type = 'choropleth', (what type of geographical plot are you doing)
- locations = list of states
- locationmode = 'USA-states'
- colorscale=

Either a predefined string:

```
'pairs' | 'Greys' | 'Greens' | 'Bluered' | 'Hot' | 'Picnic' | 'Portland' | 'Jet' | 'RdBu' | 'Blackbody' | 'Earth' | 'Electric' | 'YIOrRd' | 'YIGnBu'
```

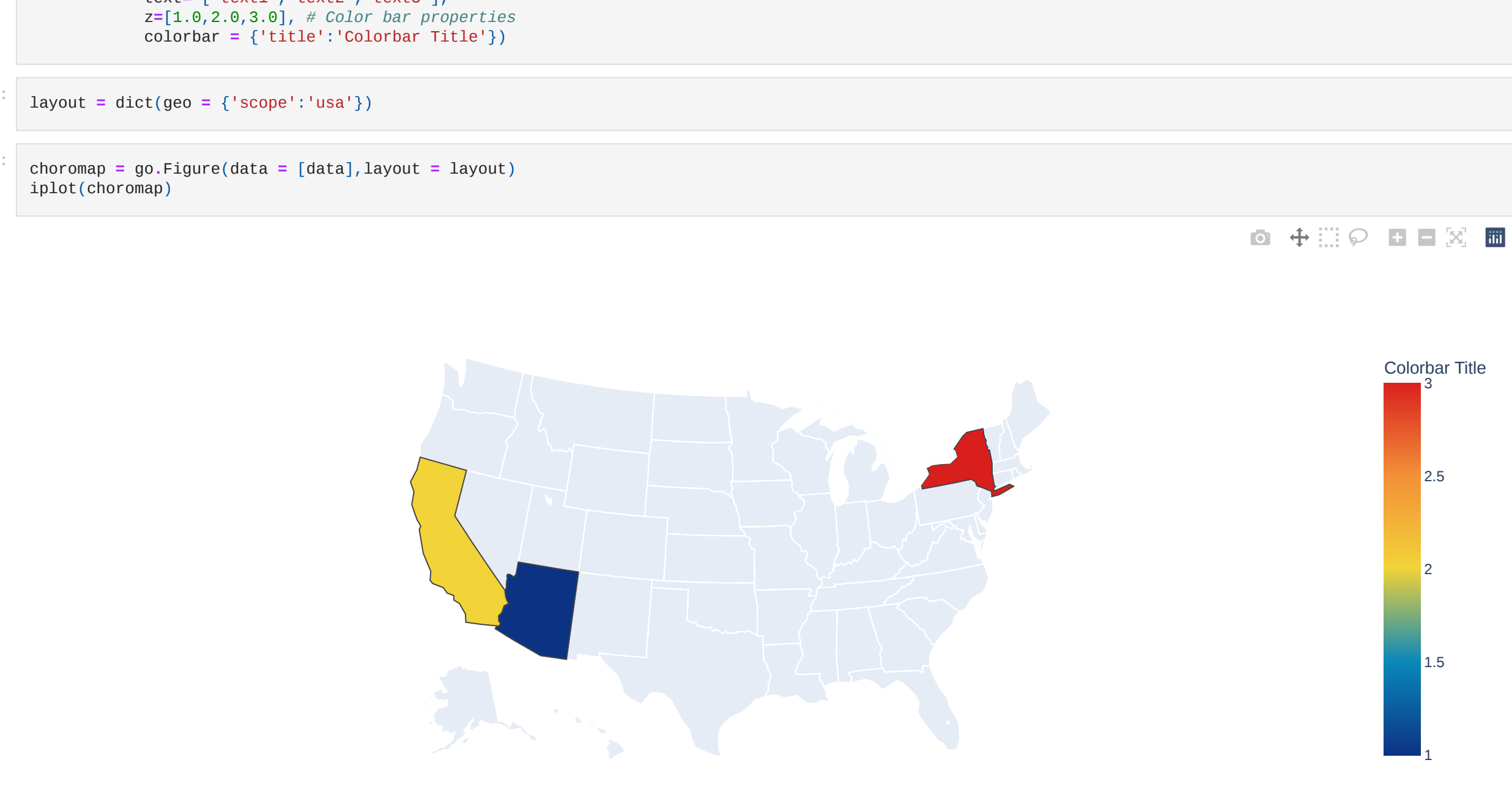
or create a custom colorscale

- text= list or array of text to display per point
- z= array of values on z axis (color of state)
- colorbar = {'title':'Colorbar Title'})

In [21]:
```
data = dict(type = 'choropleth',
            locations = ['AZ','CA','NY'],
            locationmode = 'USA-states',
            colorscale= 'Portland',
            text= ['text1','text2','text3'],
            z=[1.0,2.0,3.0], # Color bar properties
            colorbar = {'title':'Colorbar Title'})
```

In [22]:
```
layout = dict(geo = {'scope':'usa'})
```

In [23]:
```
choromap = go.Figure(data = [data],layout = layout)
iplot(choromap)
```



Another Example with real data (Remember to Create 2 variable Data variable and Layout Variable)

In [24]:
```
df = pd.read_csv('07 Visualization (Plotly and Cufflinks) 2011_US_AGRI_Exports.csv')
df.head()
```

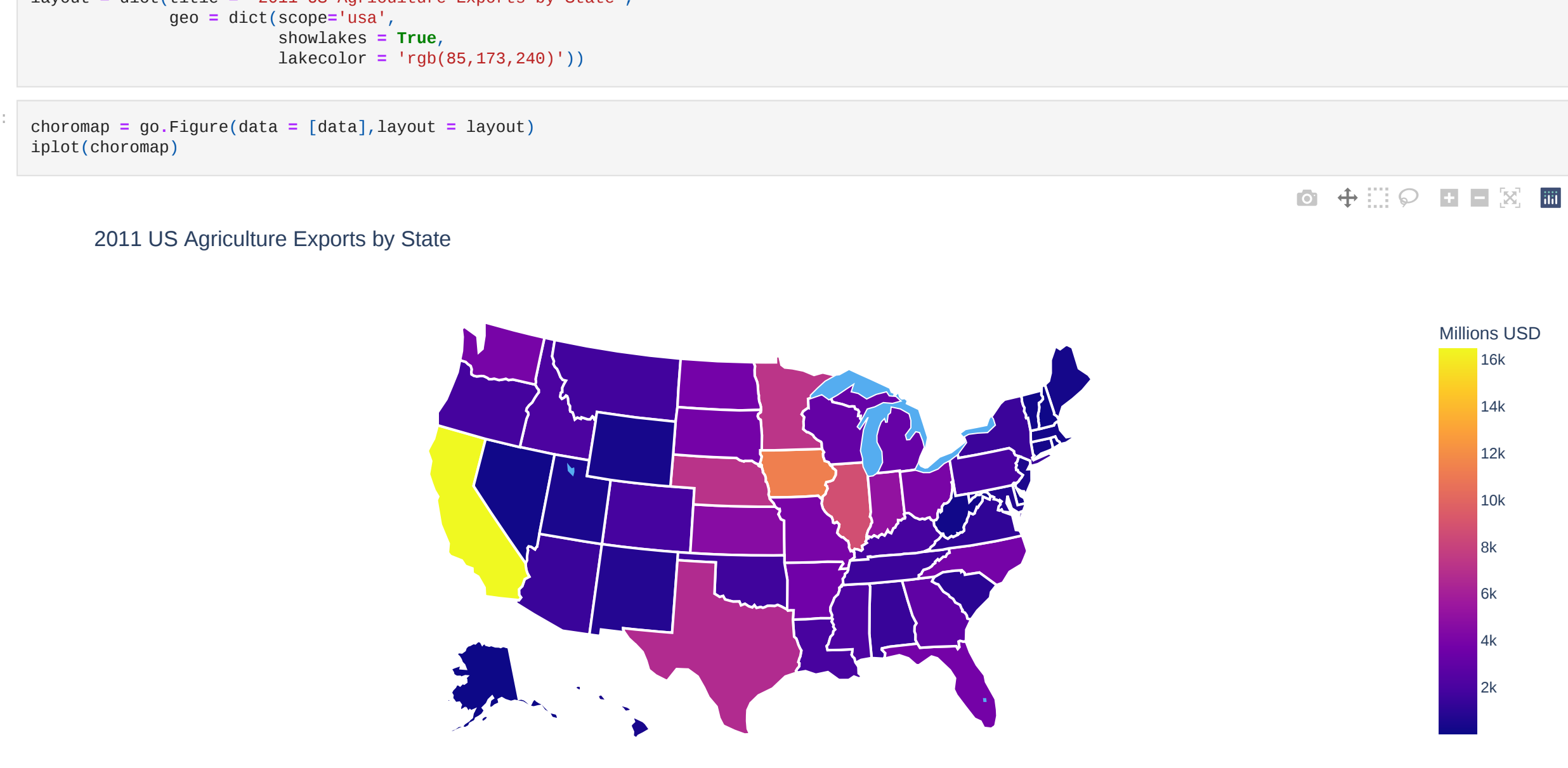
Out[24]:

	code	state	category	total exports	beef	pork	poultry	dairy	fruits fresh	fruits proc	total fruits	veggies fresh	veggies proc	total veggies	corn	wheat	cotton	text
0	AL	Alabama	state	1390.63	34.4	10.6	481.0	4.06	8.0	17.1	25.11	5.5	8.9	14.33	34.9	70.0	317.61	Alabama Beef 34.4 Dairy 4.06 Fruits 25.1...
1	AK	Alaska	state	13.31	0.2	0.1	0.0	0.19	0.0	0.0	0.00	0.6	1.0	1.56	0.0	0.0	0.00	Alaska Beef 0.2 Dairy 0.19 Fruits 0.0 Ve...
2	AZ	Arizona	state	1463.17	71.3	17.9	0.0	105.48	19.3	41.0	60.27	147.5	239.4	386.91	7.3	48.7	423.95	Arizona Beef 71.3 Dairy 105.48 Fruits 60...
3	AR	Arkansas	state	3586.02	53.2	29.4	562.9	3.53	2.2	4.7	6.88	4.4	7.1	11.45	69.5	114.5	665.44	Arkansas Beef 53.2 Dairy 3.53 Fruits 6.8...
4	CA	California	state	16472.88	228.7	11.1	225.4	929.95	2791.8	5944.6	8736.40	803.2	1303.5	2106.79	34.6	249.3	1064.95	California Beef 228.7 Dairy 929.95 Frui...

In [25]:
```
data = dict(type='choropleth',
            #colorscale = 'YIOrRd',
            locations = df['code'],
            z = df['total exports'],
            locationmode = 'USA-states',
            text = df['text'],
            marker = dict(line = dict(color = 'rgb(255,255,255)',width = 2)),
            colorbar = {'title':"Millions USD"}
            )
```

In [26]:
```
layout = dict(title = '2011 US Agriculture Exports by State',
              geo = dict(scope='usa',
                         showlakes = True,
                         lakecolor = 'rgb(85,173,240)'))
```

In [27]:
```
choromap = go.Figure(data = [data],layout = layout)
iplot(choromap)
```



Another Example with real data (Remember to Create 2 variable Data variable and Layout Variable)

In [28]:
```
df = pd.read_csv('07 Visualization (Plotly and Cufflinks) 2014_World_GDP.csv')
df.head()
```

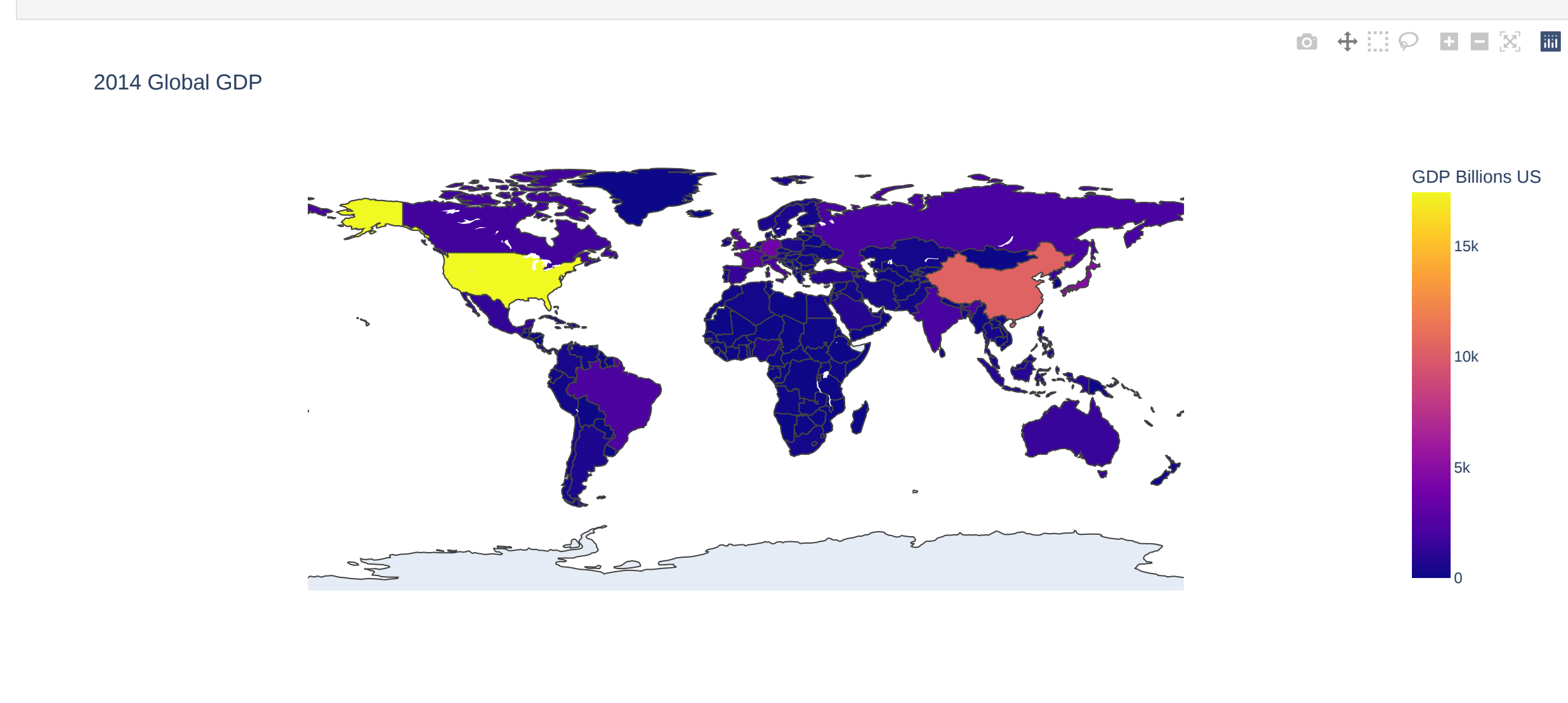
Out[28]:

	COUNTRY	GDP (BILLIONS)	CODE
0	Afghanistan	21.71	AFG
1	Albania	13.40	ALB
2	Algeria	227.80	DZA
3	American Samoa	0.75	ASM
4	Andorra	4.80	AND

In [29]:
```
data = dict(
        type = 'choropleth',
        locations = df['CODE'],
        z = df['GDP (BILLIONS)'],
        text = df['COUNTRY'],
        colorbar = {'title' : 'GDP Billions US'},
      )
```

In [30]:
```
layout = dict(
    title = '2014 Global GDP',
    geo = dict(
        showframe = False,
        #projection = {'type':'Mercator'}
    )
)
```

In [31]:
```
choromap = go.Figure(data = [data],layout = layout)
iplot(choromap)
```



In [ ]: