About Plotly

Plotly is a Data Viz library by the company Plotly based out of Canada with support in languages such as Python, Js, Julia etc.

Advantages

- Multi language support
- Lot's of graphs
- Interactive plots
- Beautiful plots

Does not work with live data streams. Dash can be explored for that.

The Plotly Roadmap

- Plotly Go
- Plotly Express
- Dash

Working with Plotly Go

```
# import the libraries
import plotly.graph_objects as go
import numpy as np
import pandas as pd
import plotly.express as px
```

```
!pip install plotly
```

```
# import datasets
tips = px.data.tips()
iris = px.data.iris()
gap = px.data.gapminder()
```

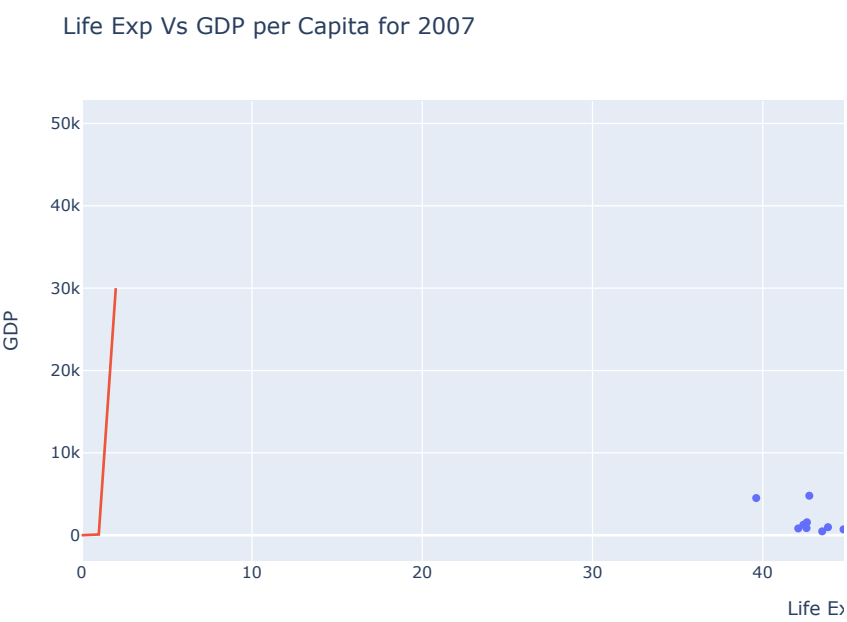
```
gap.head()
```

	country	continent	year	lifeExp	pop	gdpPercap	iso_alpha	iso_num
0	Afghanistan	Asia	1952	28.801	8425333	779.445314	AFG	4
1	Afghanistan	Asia	1957	30.332	9240934	820.853030	AFG	4
2	Afghanistan	Asia	1962	31.997	10267083	853.100710	AFG	4
3	Afghanistan	Asia	1967	34.020	11537966	836.197138	AFG	4
4	Afghanistan	Asia	1972	36.088	13079460	739.981106	AFG	4

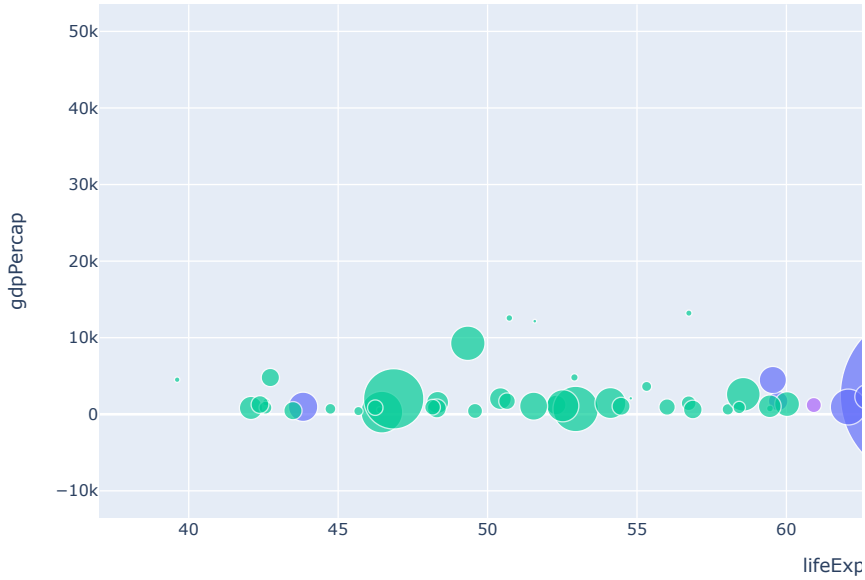
```
# scatter plot using plotly go

temp_df = gap[gap['year'] == 2007]
temp_df
```

	country	continent	year	lifeExp	pop	gdpPercap	iso_alpha	iso_
11	Afghanistan	Asia	2007	43.828	31889923	974.580338	AFG	
23	Albania	Europe	2007	76.423	3600523	5937.029526	ALB	
35	Algeria	Africa	2007	72.301	33333216	6223.367465	DZA	
47	Angola	Africa	2007	42.731	12420476	4797.231267	AGO	
59	Argentina	Americas	2007	75.320	40301927	12779.379640	ARG	
...	...	...	...	...	...	...	...	
1655	Vietnam	Asia	2007	74.249	85262356	2441.576404	VNM	
1667	West Bank and Gaza	Asia	2007	73.422	4018332	3025.349798	PSE	
1679	Yemen, Rep.	Asia	2007	62.698	22211743	2280.769906	YEM	
1691	Zambia	Africa	2007	42.384	11746035	1271.211593	ZMB	
1703	Zimbabwe	Africa	2007	43.487	12311143	469.709298	ZWE	

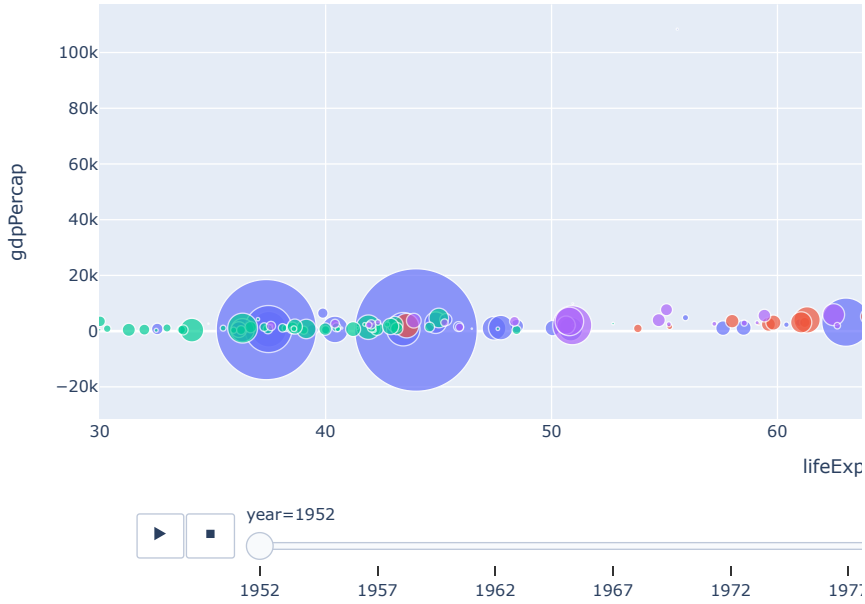
```
trace1 = go.Scatter(x=temp_df['lifeExp'],y=temp_df['gdpPercap'],mode='markers')
trace2 = go.Scatter(x=[0,1,2],y=[0,90,30000],mode='lines')

data = [trace1,trace2]

layout = go.Layout(title='Life Exp Vs GDP per Capita for 2007', xaxis={'title':'Life Exp'},yaxis={'title':'GDP'})
fig = go.Figure(data,layout)

fig.show()
```



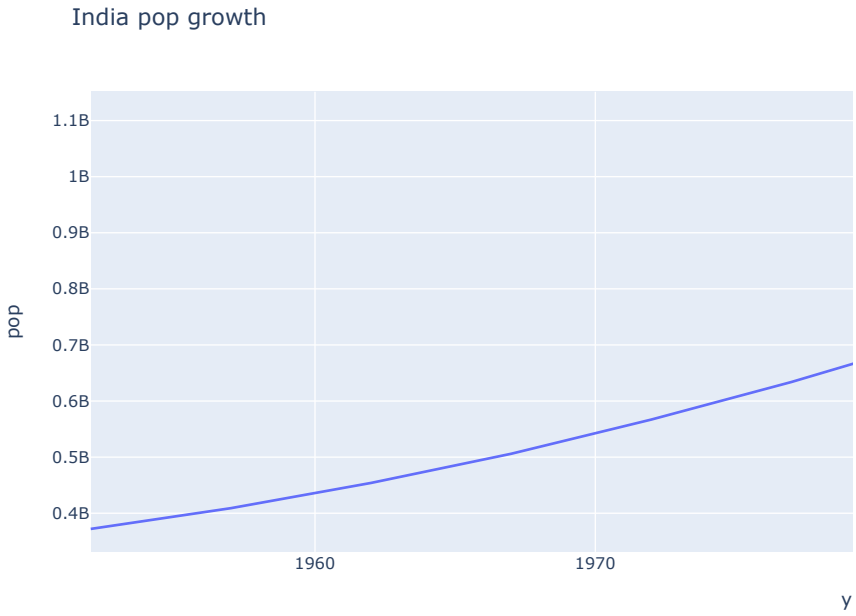

```
# plot life exp and gdp scatter plot -> continent as color -> pop as size -> hover name -> range_x/range_y -> log_x/log_y
px.scatter(temp_df, x='lifeExp', y='gdpPercap',color='continent',size='pop',size_max=100, hover_name='country')
```




```
# plot animation of the above curve on the basic of year
px.scatter(gap, x='lifeExp', y='gdpPercap',
           color='continent',size='pop',
           size_max=100, hover_name='country',
           range_x=[30,95],
           animation_frame='year',animation_group='country')
```



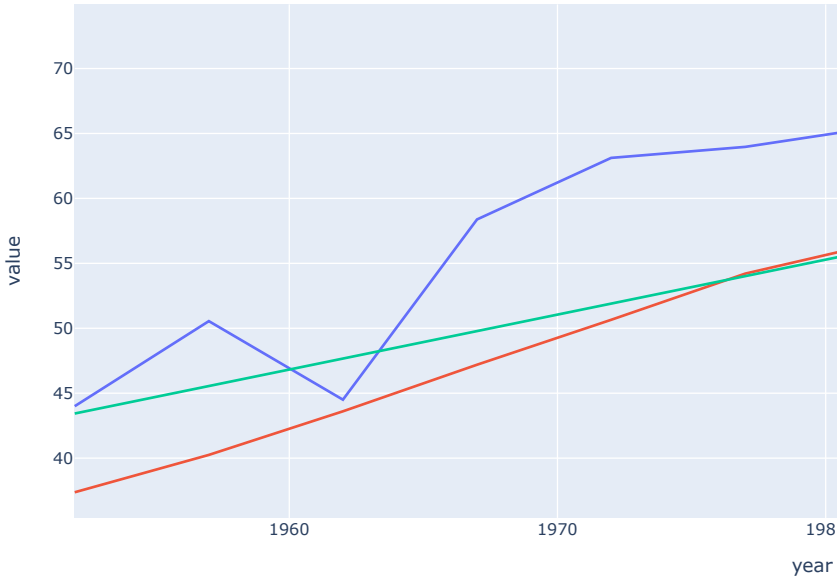

```
# line plot
# plot india pop line plot
temp_df = gap[gap['country'] == 'India']

px.line(temp_df, x='year', y='pop',title='India pop growth')
```



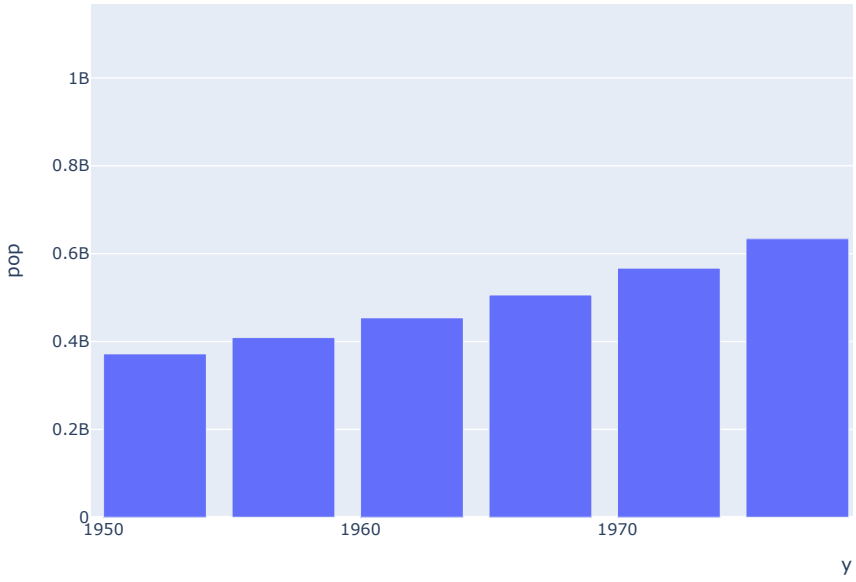

```
# plot india china pak line plot
temp_df = gap[gap['country'].isin(['India','China','Pakistan'])].pivot(index='year',columns='country',values='lifeExp')
temp_df
```

country	China	India	Pakistan
year			
1952	44.00000	37.373	43.436
1957	50.54896	40.249	45.557
1962	44.50136	43.605	47.670
1967	58.38112	47.193	49.800
1972	63.11888	50.651	51.929
1977	63.96736	54.208	54.043
1982	65.52500	56.596	56.158
1987	67.27400	58.553	58.245
1992	68.69000	60.223	60.838
1997	70.42600	61.765	61.818
2002	72.02800	62.879	63.610
2007	72.96100	64.698	65.483

```
px.line(temp_df, x=temp_df.index, y=temp_df.columns)
```



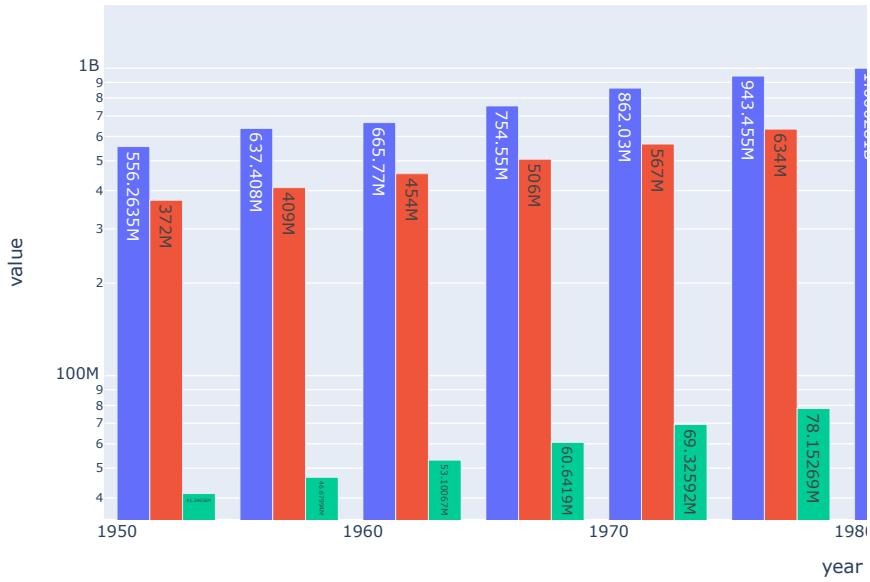

```
# bar chart
# india's pop over the years
temp_df = gap[gap['country'] == 'India']
px.bar(temp_df,x='year',y='pop')
```



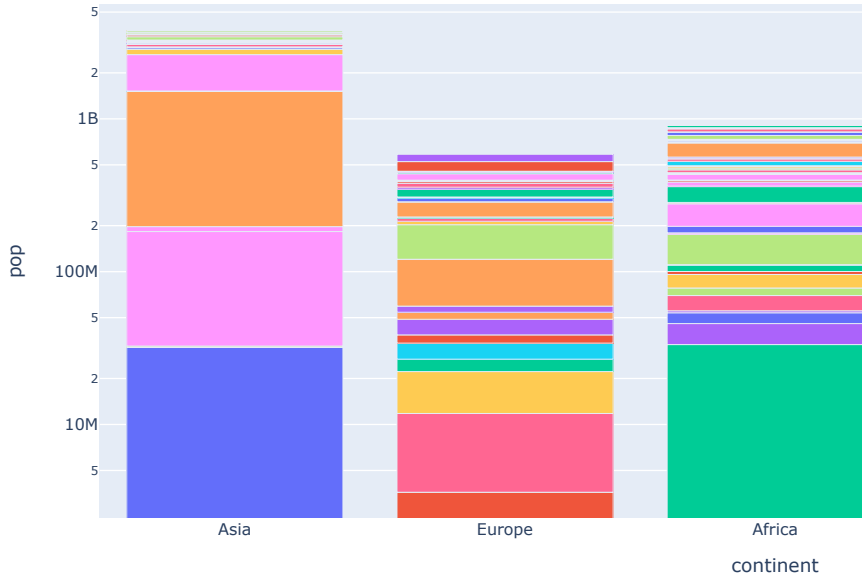

```
# pop comp of 3 countries
temp_df = gap[gap['country'].isin(['India','China','Pakistan'])].pivot(index='year',columns='country',values='pop')
temp_df
```

country	China	India	Pakistan
year			
1952	556263527	372000000	41346560
1957	637408000	409000000	46679944
1962	665770000	454000000	53100671
1967	754550000	506000000	60641899
1972	862030000	567000000	69325921
1977	943455000	634000000	78152686
1982	1000281000	708000000	91462088
1987	1084035000	788000000	105186881
1992	1164970000	872000000	120065004
1997	1230075000	959000000	135564834
2002	1280400000	1034172547	153403524
2007	1318683096	1110396331	169270617

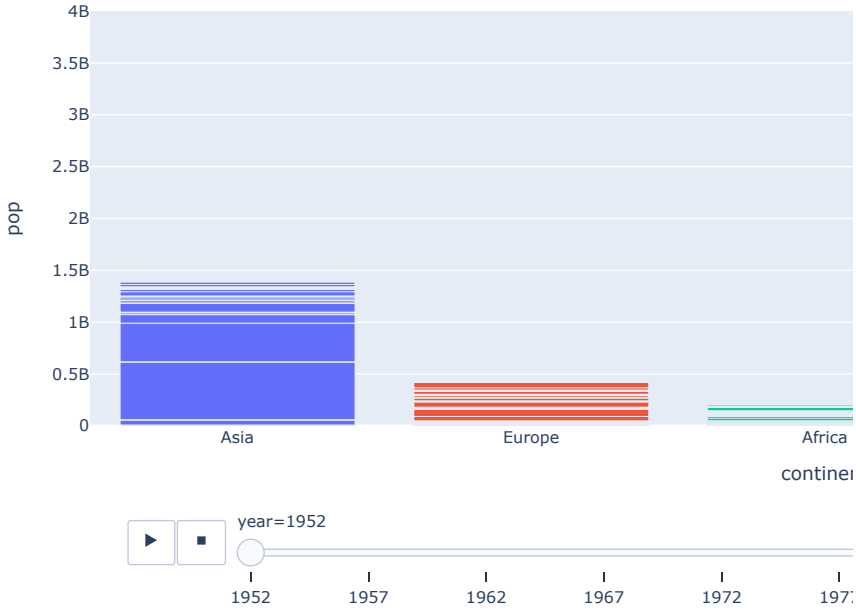
```
# grouped bar chart -> text_auto
px.bar(temp_df,x=temp_df.index,y=temp_df.columns,barmode='group',log_y=True,text_auto=True)
```



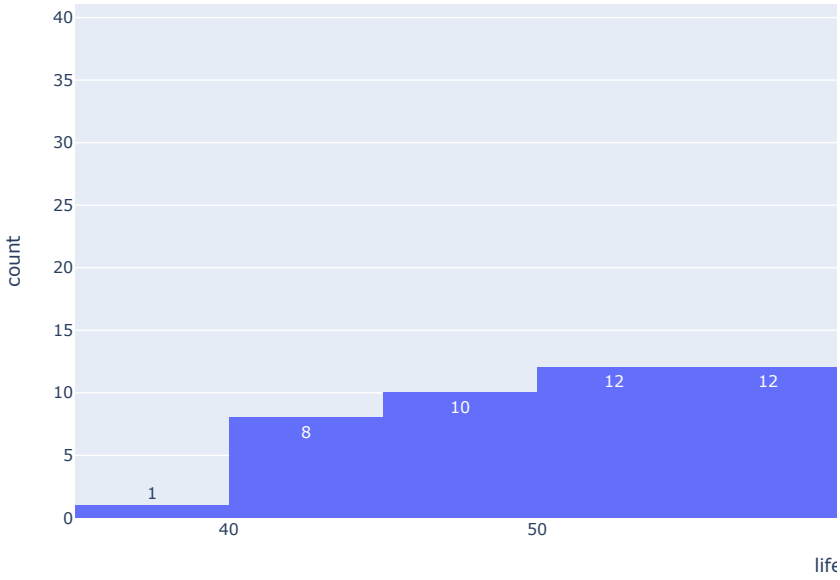

```
# stacked bar chart
# pop contribution per country to a continents pop stacked for a particular year(2007)
temp_df = gap[gap['year'] == 2007]
px.bar(temp_df, x='continent', y='pop', color='country',log_y=True)
```



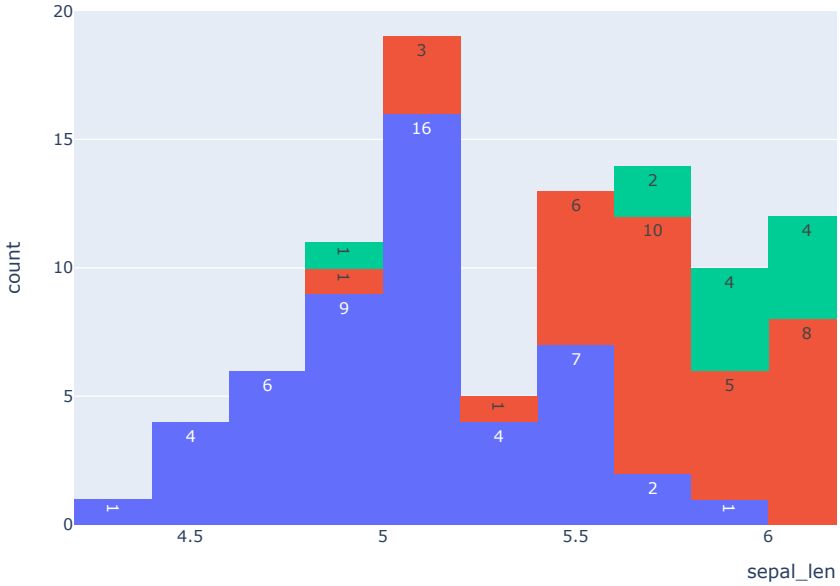

```
# bar chart animation
px.bar(gap, x='continent',y='pop',color='continent',animation_frame='year',animation_group='country',range_y=[0,4000000000])
```



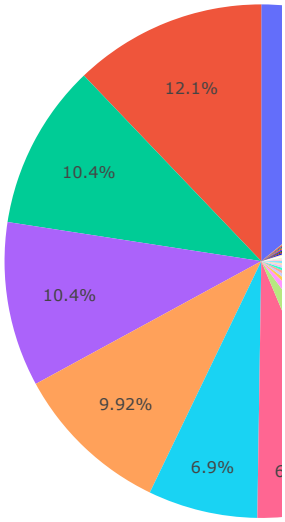

```
# histogram
# plot histogram of life expt of all countries in 2007 -> nbins -> text_auto
temp_df = gap[gap['year'] == 2007]

px.histogram(temp_df, x='lifeExp',nbins=10,text_auto=True)
```




```
# plot histogram of sepal length of all iris species
px.histogram(iris,x='sepal_length',color='species',nbins=30,text_auto=True)
```




```
# Pie -> values -> names
# find the pie chart of pop of european countries in 2007

temp_df = gap[(gap['year'] == 2007) & (gap['continent'] == 'Europe')]

px.pie(temp_df, values='pop', names='country')
```

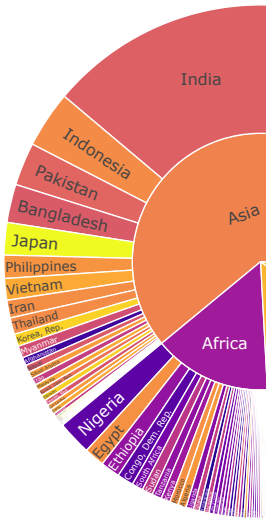



```
# plot pie chart of world pop in 1952 continent wise ->  -> explode(pull)

temp_df = gap[gap['year'] == 1952].groupby('continent')['pop'].sum().reset_index()
px.pie(temp_df, values='pop', names='continent')
```

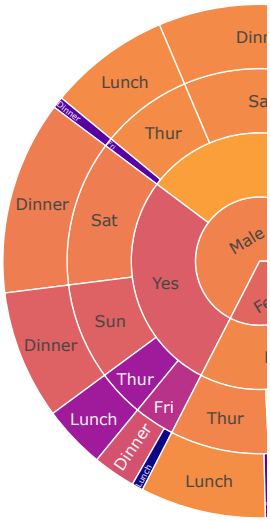
```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-136-91f06935b01d> in <module>
      2
      3 temp_df = gap[gap['year'] == 1952].groupby('continent')
['pop'].sum().reset_index()
----> 4 px.pie(temp_df, values='pop', names='continent',pull=[0,0.2,0,0,0])

TypeError: pie() got an unexpected keyword argument 'pull'
```

SEARCH STACK OVERFLOW

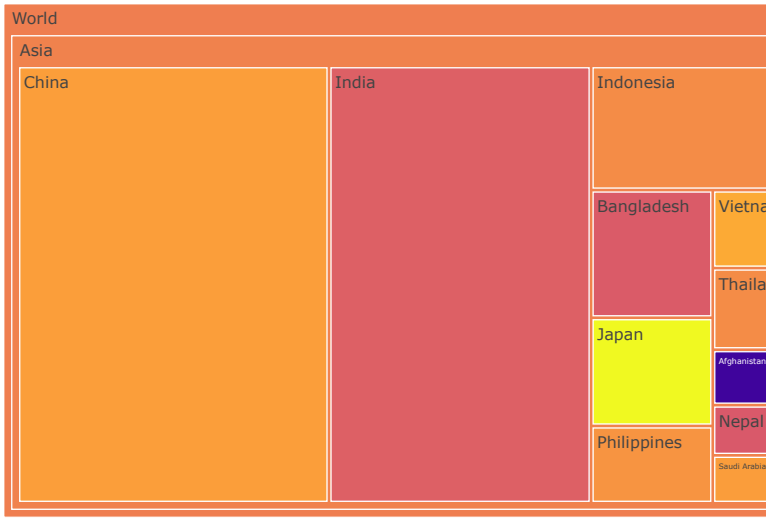
```
# Sunburst plot -> Sunburst plots visualize hierarchical data spanning outwards radially from root to leaves. -> color
# path -> [], values

temp_df = gap[gap['year'] == 2007]

px.sunburst(temp_df, path=['continent','country'],values='pop',color='lifeExp')
```



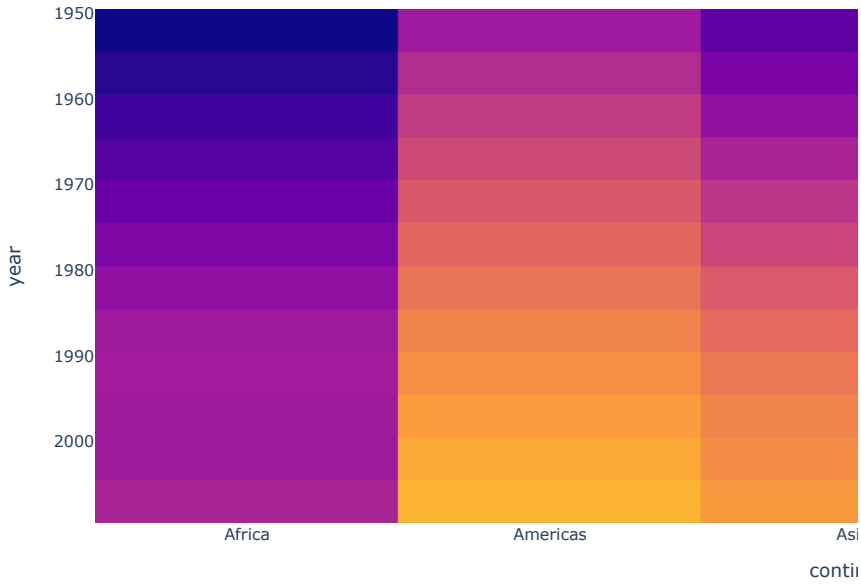
```
px.sunburst(tips,path=['sex','smoker','day','time'],values='total_bill',color='size')
```



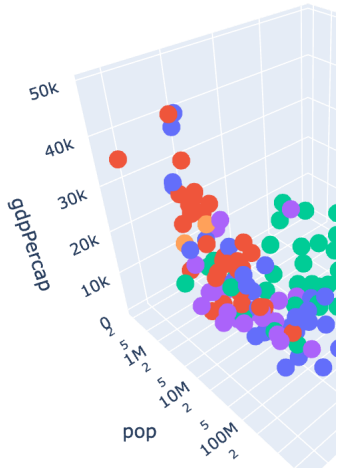

```
# Treemap
temp_df = gap[gap['year'] == 2007]

px.treemap(temp_df, path=[px.Constant('World'),'continent','country'],values='pop',color='lifeExp')
```



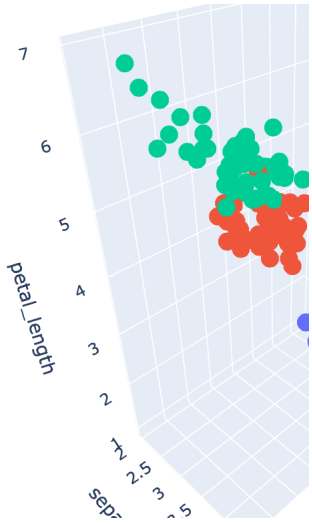

```
# Heatmap -> find heatmap of all continents with year on avg life exp
#temp_df = tips.pivot_table(index='day',columns='sex',values='total_bill',aggfunc='sum')

temp_df = gap.pivot_table(index='year',columns='continent',values='lifeExp',aggfunc='mean')
px.imshow(temp_df)
```



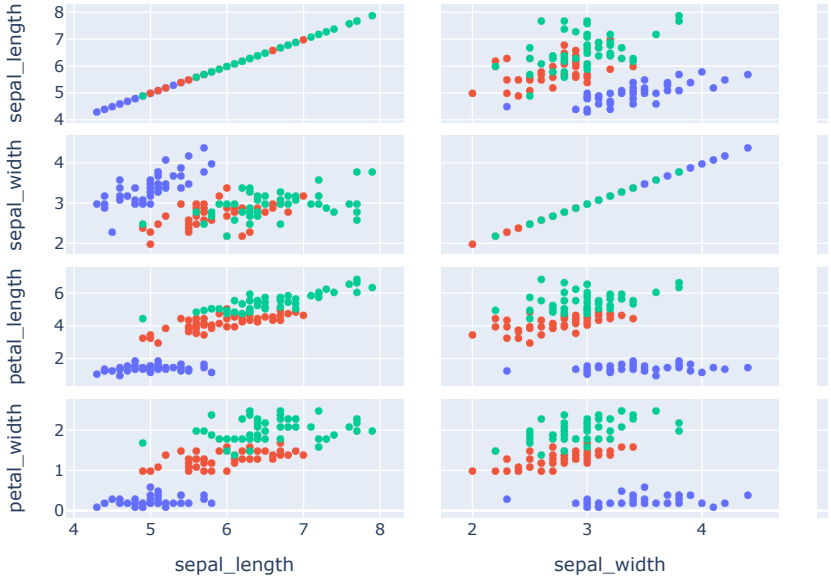

```
# 3d scatterplot
# plot a 3d scatter plot of all country data for 2007
temp_df = gap[gap['year'] == 2007]
px.scatter_3d(temp_df, x='lifeExp',y='pop',z='gdpPercap',log_y=True,color='continent',hover_name='country')
```




```
px.scatter_3d(iris,x='sepal_length',y='sepal_width',z='petal_length',color='species')
```



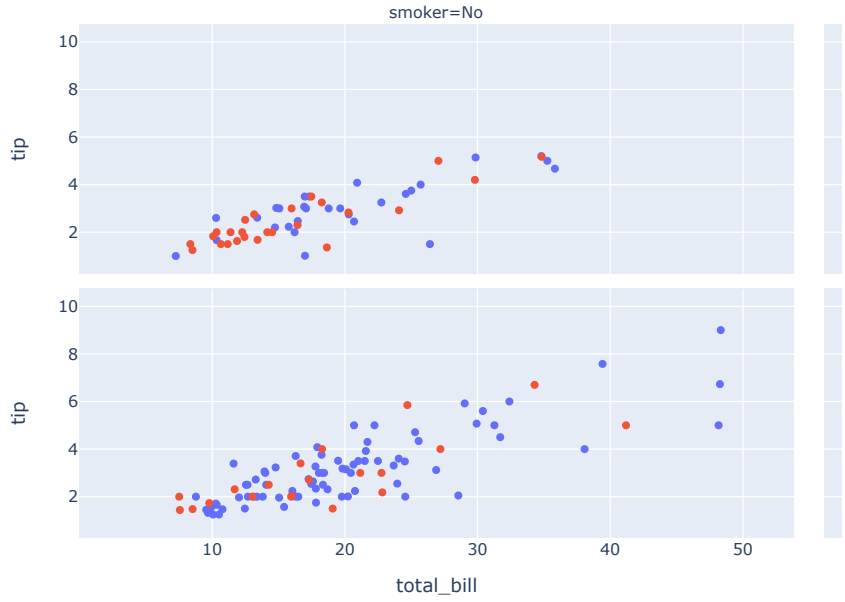

```
# scatter_matrix -> dimensions
px.scatter_matrix(iris,dimensions=['sepal_length','sepal_width','petal_length','petal_width'],color='species')
```



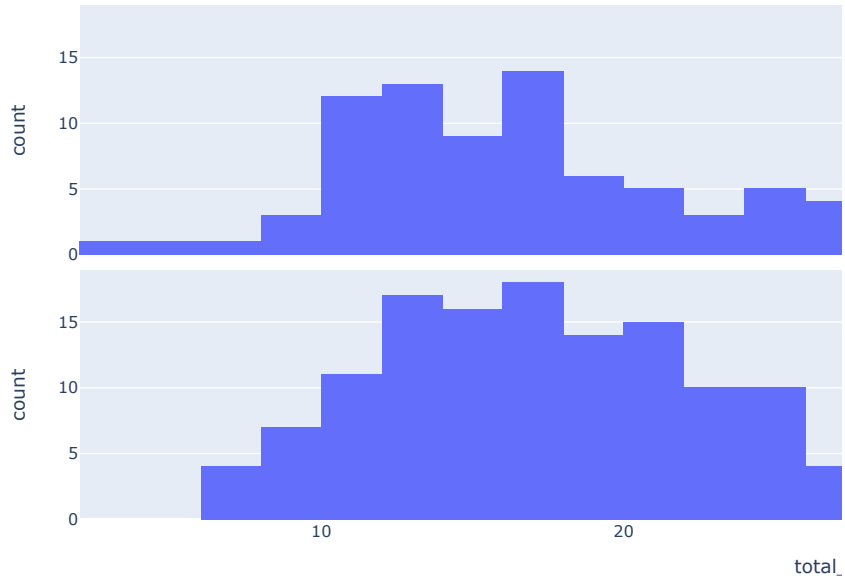

```
import plotly.graph_objects as go
import plotly.express as px
import numpy as np
```

```
# facet plot
tips = px.data.tips()
gap = px.data.gapminder()
```

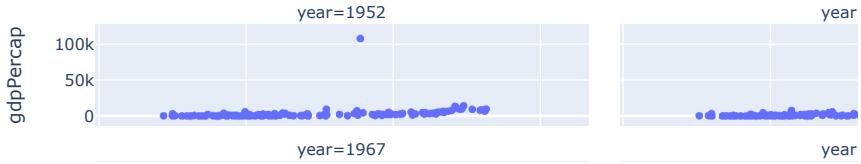
```
px.scatter(tips, x='total_bill', y='tip', facet_col='smoker', facet_row='sex',color='time')
```




```
px.histogram(tips,x='total_bill',facet_row='sex')
```




```
px.scatter(gap, x='lifeExp', y='gdpPercap', facet_col='year', facet_col_wrap=3)
```


year=1952
year
gdpPercap
100k
50k
0
year=1967
year