

Data Visualization With Plotly (Part - 1)

```
In [1]: import numpy as np
import pandas as pd
import plotly.graph_objects as go
import plotly.offline as po
from plotly.offline import download_plotlyjs, init_notebook_mode, plot, iplot
import matplotlib.pyplot as plt
import dash
import plotly.express as px
import random
import plotly.figure_factory as ff
```

Loading Datasets

```
In [2]: pokemon = pd.read_csv("C:/Users/DELL/Documents/GitHub/Public/Data-Visualization/Plotly/Datasets/pokemon_updated.csv")
pokemon.head(10)
```

Out[2]:

	#	Name	Type 1	Type 2	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation	Legendary	Total
0	1	Bulbasaur	Grass	Poison	45	49	49	65	65	45	1	False	318
1	2	Ivysaur	Grass	Poison	60	62	63	80	80	60	1	False	405
2	3	Venusaur	Grass	Poison	80	82	83	100	100	80	1	False	525
3	3	VenusaurMega Venusaur	Grass	Poison	80	100	123	122	120	80	1	False	625
4	4	Charmander	Fire	NaN	39	52	43	60	50	65	1	False	309
5	5	Charmeleon	Fire	NaN	58	64	58	80	65	80	1	False	405
6	6	Charizard	Fire	Flying	78	84	78	109	85	100	1	False	534
7	6	CharizardMega Charizard X	Fire	Dragon	78	130	111	130	85	100	1	False	634
8	6	CharizardMega Charizard Y	Fire	Flying	78	104	78	159	115	100	1	False	634
9	7	Squirtle	Water	NaN	44	48	65	50	64	43	1	False	314

```
In [3]: stdperf = pd.read_csv("C:/Users/DELL/Documents/GitHub/Public/Data-Visualization/Plotly/Datasets/studenttp.csv")
stdperf.head(10)
```

Out[3]:

	gender	race/ethnicity	parental level of education	lunch	test preparation course	math score	reading score	writing score
0	female	group B	bachelor's degree	standard	none	72	72	74
1	female	group C	some college	standard	completed	69	90	88
2	female	group B	master's degree	standard	none	90	95	93
3	male	group A	associate's degree	free/reduced	none	47	57	44
4	male	group C	some college	standard	none	76	78	75
5	female	group B	associate's degree	standard	none	71	83	78
6	female	group B	some college	standard	completed	88	95	92
7	male	group B	some college	free/reduced	none	40	43	39
8	male	group D	high school	free/reduced	completed	64	64	67
9	female	group B	high school	free/reduced	none	38	60	50

```
In [4]: corona = pd.read_csv('C:/Users/DELL/Documents/GitHub/Public/COVID-19/covid/data/countries-aggregated.csv' ,
                             index_col='Date' , parse_dates=True)
corona.head(10)
```

Out[4]:

	Country	Confirmed	Recovered	Deaths
Date				
2020-01-22	Afghanistan	0	0	0
2020-01-22	Albania	0	0	0
2020-01-22	Algeria	0	0	0
2020-01-22	Andorra	0	0	0
2020-01-22	Angola	0	0	0
2020-01-22	Antigua and Barbuda	0	0	0
2020-01-22	Argentina	0	0	0
2020-01-22	Armenia	0	0	0
2020-01-22	Australia	0	0	0
2020-01-22	Austria	0	0	0



```
In [5]: spotify = pd.read_csv("C:/Users/DELL/Documents/GitHub/Public/Data-Visualization/Plotly/Datasets/spotify.csv" , index_col=0)
spotify.head(10)
```

Out[5]:

	Shape of You	Despacito	Something Just Like This	HUMBLE.	Unforgettable
Date					
2017-01-06	12287078	NaN	NaN	NaN	NaN
2017-01-07	13190270	NaN	NaN	NaN	NaN
2017-01-08	13099919	NaN	NaN	NaN	NaN
2017-01-09	14506351	NaN	NaN	NaN	NaN
2017-01-10	14275628	NaN	NaN	NaN	NaN
2017-01-11	14372699	NaN	NaN	NaN	NaN
2017-01-12	14148108	NaN	NaN	NaN	NaN
2017-01-13	14536236	275178.0	NaN	NaN	NaN
2017-01-14	14173311	1144886.0	NaN	NaN	NaN
2017-01-15	12889849	1288198.0	NaN	NaN	NaN

```
In [6]: housing = pd.read_csv('C:/Users/DELL/Documents/GitHub/Data-Visualization/housing.csv')
housing.tail()
```

Out[6]:

	longitude	latitude	housing_median_age	total_rooms	total_bedrooms	population	households	median_income	median_house_value	ocean_proximity
20635	-121.09	39.48	25.0	1665.0	374.0	845.0	330.0	1.5603	78100.0	near bay or ocean
20636	-121.21	39.49	18.0	697.0	150.0	356.0	114.0	2.5568	77100.0	near bay or ocean
20637	-121.22	39.43	17.0	2254.0	485.0	1007.0	433.0	1.7000	92300.0	near bay or ocean
20638	-121.32	39.43	18.0	1860.0	409.0	741.0	349.0	1.8672	84700.0	near bay or ocean
20639	-121.24	39.37	16.0	2785.0	616.0	1387.0	530.0	2.3886	89400.0	near bay or ocean

```
In [7]: insurance = pd.read_csv('C:/Users/DELL/Documents/GitHub/Data-Visualization/insurance.csv')
insurance.head(10)
```

Out[7]:

	age	sex	bmi	children	smoker	region	charges
0	19	female	27.900	0	yes	southwest	16884.92400
1	18	male	33.770	1	no	southeast	1725.55230
2	28	male	33.000	3	no	southeast	4449.46200
3	33	male	22.705	0	no	northwest	21984.47061
4	32	male	28.880	0	no	northwest	3866.85520
5	31	female	25.740	0	no	southeast	3756.62160
6	46	female	33.440	1	no	southeast	8240.58960
7	37	female	27.740	3	no	northwest	7281.50560
8	37	male	29.830	2	no	northeast	6406.41070
9	60	female	25.840	0	no	northwest	28923.13692

```
In [8]: employment = pd.read_excel("C:/Users/DELL/Documents/GitHub/Public/Data-Visualization/Plotly/Datasets/unemployment.xlsx")
employment.head(10)
```

Out[8]:

	Age	Gender	Period	Unemployed
0	16 to 19 years	Men	2005-01-01	91000
1	20 to 24 years	Men	2005-01-01	175000
2	25 to 34 years	Men	2005-01-01	194000
3	35 to 44 years	Men	2005-01-01	201000
4	45 to 54 years	Men	2005-01-01	207000
5	55 to 64 years	Men	2005-01-01	101000
6	65 years and over	Men	2005-01-01	33000
7	16 to 19 years	Women	2005-01-01	38000
8	20 to 24 years	Women	2005-01-01	90000
9	25 to 34 years	Women	2005-01-01	142000

In [9]: helpdesk = pd.read_csv("C:/Users/DELL/Documents/GitHub/Public/Data-Visualization/Plotly/Datasets/helpdesk.csv")
helpdesk.head(10)

Out[9]:

	ticket	requestor	RequestorSeniority	ITOwner	FiledAgainst	TicketType	Severity	Priority	daysOpen	Satisfaction
0	1	1929	1 - Junior	50	Systems	Issue	2 - Normal	0 - Unassigned	3	1 - Unsatisfied
1	2	1587	2 - Regular	15	Software	Request	1 - Minor	1 - Low	5	1 - Unsatisfied
2	3	925	2 - Regular	15	Access/Login	Request	2 - Normal	0 - Unassigned	0	0 - Unknown
3	4	413	4 - Management	22	Systems	Request	2 - Normal	0 - Unassigned	20	0 - Unknown
4	5	318	1 - Junior	22	Access/Login	Request	2 - Normal	1 - Low	1	1 - Unsatisfied
5	6	858	4 - Management	38	Access/Login	Request	2 - Normal	3 - High	0	0 - Unknown
6	7	1978	3 - Senior	10	Systems	Request	2 - Normal	3 - High	9	0 - Unknown
7	8	1209	4 - Management	1	Software	Request	2 - Normal	0 - Unassigned	15	0 - Unknown
8	9	887	2 - Regular	14	Software	Request	2 - Normal	2 - Medium	6	1 - Unsatisfied
9	10	1780	3 - Senior	46	Access/Login	Request	2 - Normal	1 - Low	1	1 - Unsatisfied

In [10]: fish= pd.read_csv("Fish.csv")
fish.head(10)

Out[10]:

	Species	Weight	Length1	Length2	Length3	Height	Width
0	Bream	242.0	23.2	25.4	30.0	11.5200	4.0200
1	Bream	290.0	24.0	26.3	31.2	12.4800	4.3056
2	Bream	340.0	23.9	26.5	31.1	12.3778	4.6961
3	Bream	363.0	26.3	29.0	33.5	12.7300	4.4555
4	Bream	430.0	26.5	29.0	34.0	12.4440	5.1340
5	Bream	450.0	26.8	29.7	34.7	13.6024	4.9274
6	Bream	500.0	26.8	29.7	34.5	14.1795	5.2785
7	Bream	390.0	27.6	30.0	35.0	12.6700	4.6900
8	Bream	450.0	27.6	30.0	35.1	14.0049	4.8438
9	Bream	500.0	28.5	30.7	36.2	14.2266	4.9594

In [11]: exercise = pd.read_csv("C:/Users/DELL/Documents/GitHub/Public/Data-Visualization/Plotly/Datasets/exercise.csv")
exercise.head(10)

Out[11]:

	id	diet	pulse	time	kind
0	1	low fat	85	1 min	rest
1	1	low fat	85	15 min	rest
2	1	low fat	88	30 min	rest
3	2	low fat	90	1 min	rest
4	2	low fat	92	15 min	rest
5	2	low fat	93	30 min	rest
6	3	low fat	97	1 min	rest
7	3	low fat	97	15 min	rest
8	3	low fat	94	30 min	rest
9	4	low fat	80	1 min	rest

```
In [12]: suicide = pd.read_csv("C:/Users/DELL/Documents/GitHub/Public/Data-Visualization/Plotly/Datasets/suicide.csv")
suicide.head(10)
```

Out[12]:

	country	year	sex	age	suicides_no	population	suicides/100k pop	country-year	HDI for year	gdp_for_year (\$)	gdp_per_capita (\$)	generation
0	Albania	1987	male	15-24 years	21	312900	6.71	Albania1987	NaN	2,156,624,900	796	Generation X
1	Albania	1987	male	35-54 years	16	308000	5.19	Albania1987	NaN	2,156,624,900	796	Silent
2	Albania	1987	female	15-24 years	14	289700	4.83	Albania1987	NaN	2,156,624,900	796	Generation X
3	Albania	1987	male	75+ years	1	21800	4.59	Albania1987	NaN	2,156,624,900	796	G.I. Generation
4	Albania	1987	male	25-34 years	9	274300	3.28	Albania1987	NaN	2,156,624,900	796	Boomers
5	Albania	1987	female	75+ years	1	35600	2.81	Albania1987	NaN	2,156,624,900	796	G.I. Generation
6	Albania	1987	female	35-54 years	6	278800	2.15	Albania1987	NaN	2,156,624,900	796	Silent
7	Albania	1987	female	25-34 years	4	257200	1.56	Albania1987	NaN	2,156,624,900	796	Boomers
8	Albania	1987	male	55-74 years	1	137500	0.73	Albania1987	NaN	2,156,624,900	796	G.I. Generation
9	Albania	1987	female	5-14 years	0	311000	0.00	Albania1987	NaN	2,156,624,900	796	Generation X

```
In [13]: iris = pd.read_csv("iris.csv")
iris.head()
```

Out[13]:

	Id	Sepal Length (cm)	Sepal Width (cm)	Petal Length (cm)	Petal Width (cm)	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa

```
In [14]: canada = pd.read_csv("C:/Users/DELL/Documents/GitHub/Public/Data-Visualization/Plotly/Datasets/canada.csv")
canada.head()
```

Out[14]:

	Type	Coverage	OdName	AREA	AreaName	REG	RegName	DEV	DevName	1980	...	2004	2005	2006	2007	2008	2009	2010	2011
0	Immigrants	Foreigners	Afghanistan	935	Asia	5501	Southern Asia	902	Developing regions	16	...	2978	3436	3009	2652	2111	1746	1758	2203
1	Immigrants	Foreigners	Albania	908	Europe	925	Southern Europe	901	Developed regions	1	...	1450	1223	856	702	560	716	561	539
2	Immigrants	Foreigners	Algeria	903	Africa	912	Northern Africa	902	Developing regions	80	...	3616	3626	4807	3623	4005	5393	4752	4325
3	Immigrants	Foreigners	American Samoa	909	Oceania	957	Polynesia	902	Developing regions	0	...	0	0	1	0	0	0	0	0
4	Immigrants	Foreigners	Andorra	908	Europe	925	Southern Europe	901	Developed regions	0	...	0	0	1	1	0	0	0	0

5 rows × 43 columns

```
In [15]: canada.columns
```

```
Out[15]: Index(['Type', 'Coverage', 'OdName', 'AREA', 'AreaName', 'REG', 'RegName', 'DEV', 'DevName', '1980', '1981', '1982', '1983', '1984', '1985', '1986', '1987', '1988', '1989', '1990', '1991', '1992', '1993', '1994', '1995', '1996', '1997', '1998', '1999', '2000', '2001', '2002', '2003', '2004', '2005', '2006', '2007', '2008', '2009', '2010', '2011', '2012', '2013'],
      dtype='object')
```

```
In [16]: canada.drop(columns=['AREA' , 'DEV', 'DevName' , 'REG', 'Type', 'Coverage' , 'AreaName', 'RegName' ], inplace=True)
canada.head()
```

Out[16]:

	OdName	1980	1981	1982	1983	1984	1985	1986	1987	1988	...	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
0	Afghanistan	16	39	39	47	71	340	496	741	828	...	2978	3436	3009	2652	2111	1746	1758	2203	2635	2004
1	Albania	1	0	0	0	0	0	1	2	2	...	1450	1223	856	702	560	716	561	539	620	603
2	Algeria	80	67	71	69	63	44	69	132	242	...	3616	3626	4807	3623	4005	5393	4752	4325	3774	4331
3	American Samoa	0	1	0	0	0	0	0	1	0	...	0	0	1	0	0	0	0	0	0	0
4	Andorra	0	0	0	0	0	0	2	0	0	...	0	0	1	1	0	0	0	0	1	1

5 rows × 35 columns

```
In [17]: canada.rename(columns={'OdName':'Country'} , inplace=True)
canada.set_index(canada.Country,inplace=True)
canada.head()
```

Out[17]:

	Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	...	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
	Country																					
	Afghanistan	Afghanistan	16	39	39	47	71	340	496	741	828	...	2978	3436	3009	2652	2111	1746	1758	2203	2635	2004
	Albania	Albania	1	0	0	0	0	0	1	2	2	...	1450	1223	856	702	560	716	561	539	620	603
	Algeria	Algeria	80	67	71	69	63	44	69	132	242	...	3616	3626	4807	3623	4005	5393	4752	4325	3774	4331
	American Samoa	American Samoa	0	1	0	0	0	0	0	1	0	...	0	0	1	0	0	0	0	0	0	0
	Andorra	Andorra	0	0	0	0	0	0	2	0	0	...	0	0	1	1	0	0	0	0	1	1

5 rows × 35 columns

```
In [18]: canada2 = canada.copy()
canada2.head()
```

Out[18]:

	Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	...	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
	Country																					
	Afghanistan	Afghanistan	16	39	39	47	71	340	496	741	828	...	2978	3436	3009	2652	2111	1746	1758	2203	2635	2004
	Albania	Albania	1	0	0	0	0	0	1	2	2	...	1450	1223	856	702	560	716	561	539	620	603
	Algeria	Algeria	80	67	71	69	63	44	69	132	242	...	3616	3626	4807	3623	4005	5393	4752	4325	3774	4331
	American Samoa	American Samoa	0	1	0	0	0	0	0	1	0	...	0	0	1	0	0	0	0	0	0	0
	Andorra	Andorra	0	0	0	0	0	0	2	0	0	...	0	0	1	1	0	0	0	0	1	1

5 rows × 35 columns

```
In [19]: canada.index.name=None
canada.head()
```

Out[19]:

	Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	...	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Afghanistan	Afghanistan	16	39	39	47	71	340	496	741	828	...	2978	3436	3009	2652	2111	1746	1758	2203	2635	2004
Albania	Albania	1	0	0	0	0	0	1	2	2	...	1450	1223	856	702	560	716	561	539	620	603
Algeria	Algeria	80	67	71	69	63	44	69	132	242	...	3616	3626	4807	3623	4005	5393	4752	4325	3774	4331
American Samoa	American Samoa	0	1	0	0	0	0	0	1	0	...	0	0	1	0	0	0	0	0	0	0
Andorra	Andorra	0	0	0	0	0	0	2	0	0	...	0	0	1	1	0	0	0	0	1	1

5 rows × 35 columns

```
In [20]: del canada['Country']
canada.head()
```

Out[20]:

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	...	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Afghanistan	16	39	39	47	71	340	496	741	828	1076	...	2978	3436	3009	2652	2111	1746	1758	2203	2635	2004
Albania	1	0	0	0	0	0	1	2	2	3	...	1450	1223	856	702	560	716	561	539	620	603
Algeria	80	67	71	69	63	44	69	132	242	434	...	3616	3626	4807	3623	4005	5393	4752	4325	3774	4331
American Samoa	0	1	0	0	0	0	0	1	0	1	...	0	0	1	0	0	0	0	0	0	0
Andorra	0	0	0	0	0	0	2	0	0	0	...	0	0	1	1	0	0	0	0	1	1

5 rows × 34 columns

```
In [21]: canada = canada.transpose()
```

```
In [22]: canada.head()
```

Out[22]:

	Afghanistan	Albania	Algeria	American Samoa	Andorra	Angola	Antigua and Barbuda	Argentina	Armenia	Australia	...	Uzbekistan	Vanuatu	Venezuela (Bolivarian Republic of)	Viet Nam
1980	16	1	80	0	0	1	0	368	0	702	...	0	0	103	1191
1981	39	0	67	1	0	3	0	426	0	639	...	0	0	117	1829
1982	39	0	71	0	0	6	0	626	0	484	...	0	0	174	2162
1983	47	0	69	0	0	6	0	241	0	317	...	0	0	124	3404
1984	71	0	63	0	0	4	42	237	0	317	...	0	0	142	7583

5 rows × 197 columns

Scatter Plot

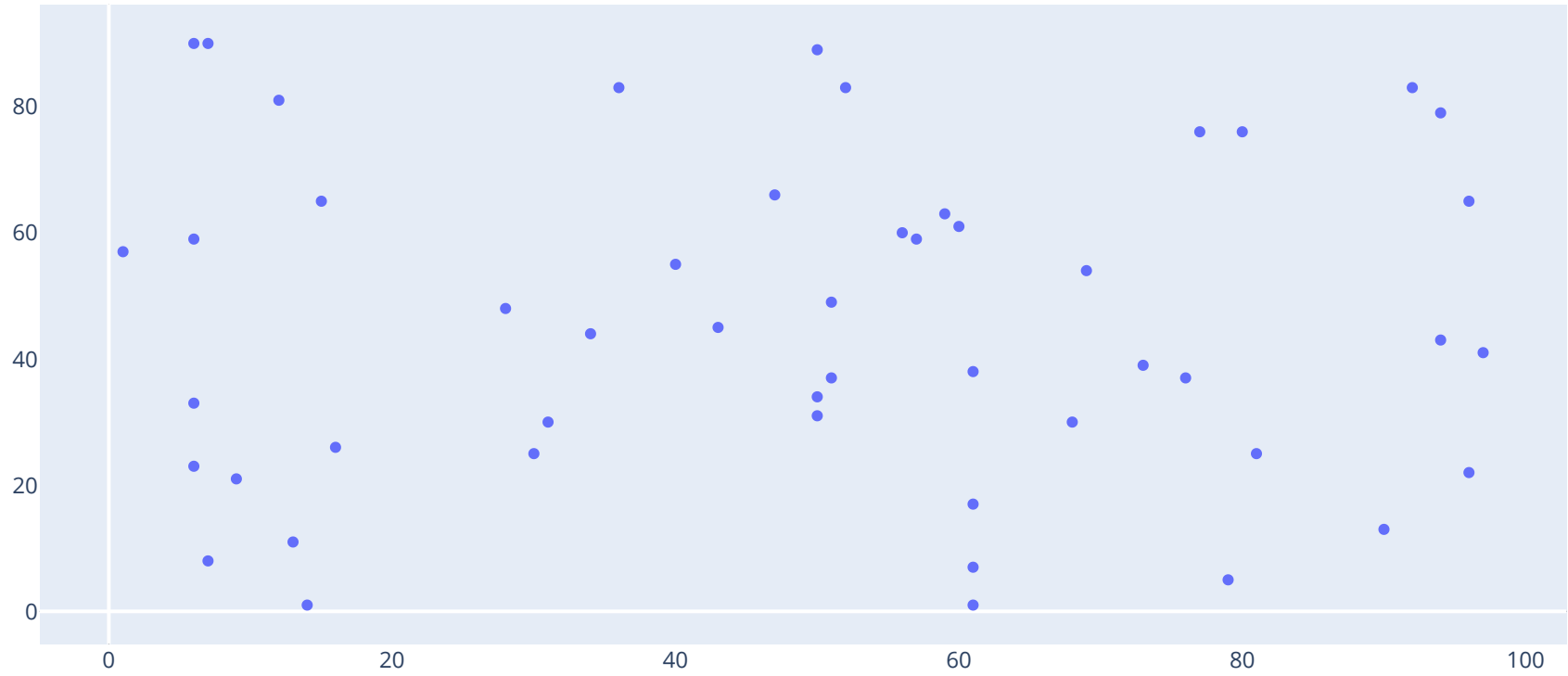
In [23]:

```
#Simple Scatter Plot
random_x = np.random.randint(1,100,50)
random_y = np.random.randint(1,100,50)

data = [go.Scatter(
    x = random_x,
    y = random_y,
    mode = 'markers'
)]

layout = go.Layout(
    xaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),
    yaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),
)

fig = go.Figure(data=data,layout=layout)
iplot(fig)
```



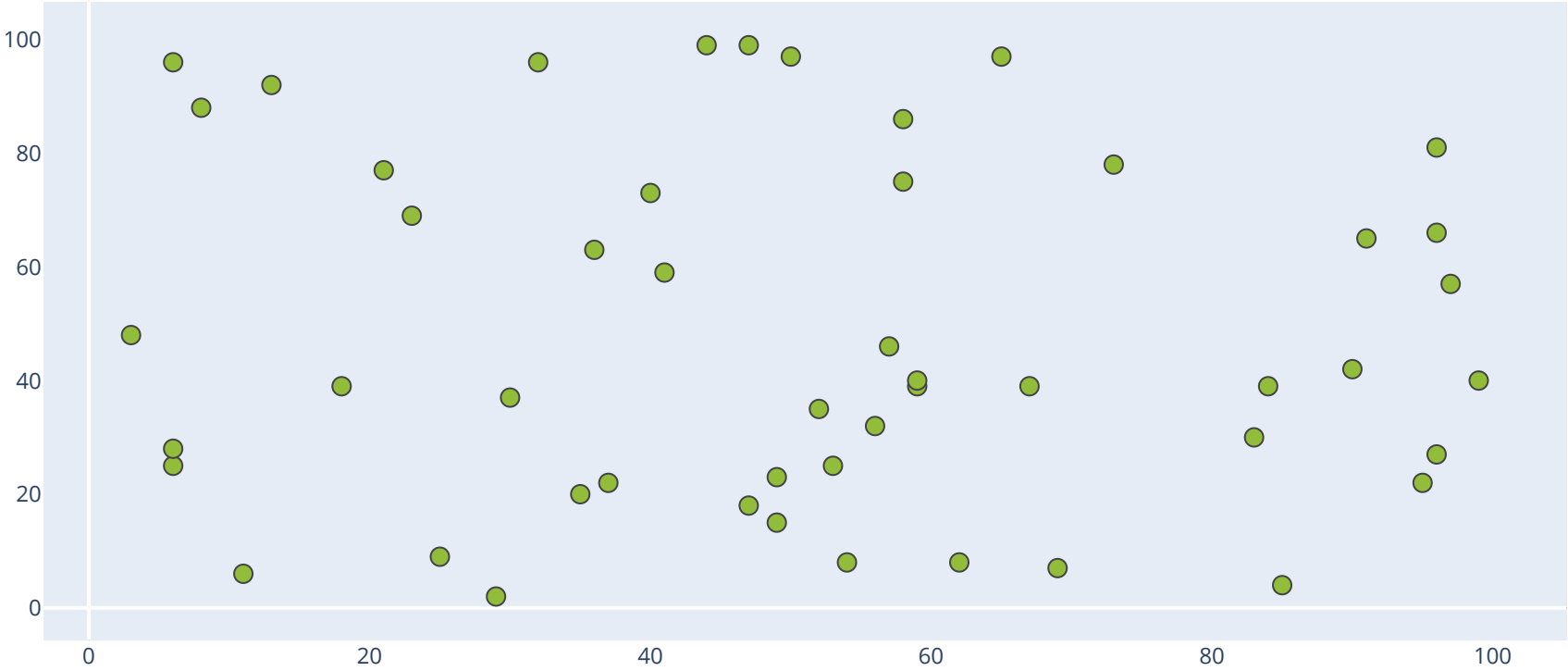
In [24]:

```
# Changing Marker size , shape & color using Marker parameter
x_val = np.random.randint(1,100,50)
y_val = np.random.randint(1,100,50)

data = [go.Scatter(
    x = x_val,
    y = y_val,
    mode = 'markers',
    marker = dict(
        size = 10,
        color = '#91bd3a', #color of marker
        symbol = 'circle', # Shape of scatter plot
        line = dict(width = 1) #width of boundary
    )
)]

layout = go.Layout(
    xaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),
    yaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),
)

fig = go.Figure(data=data,layout=layout)
iplot(fig)
```



In [25]:

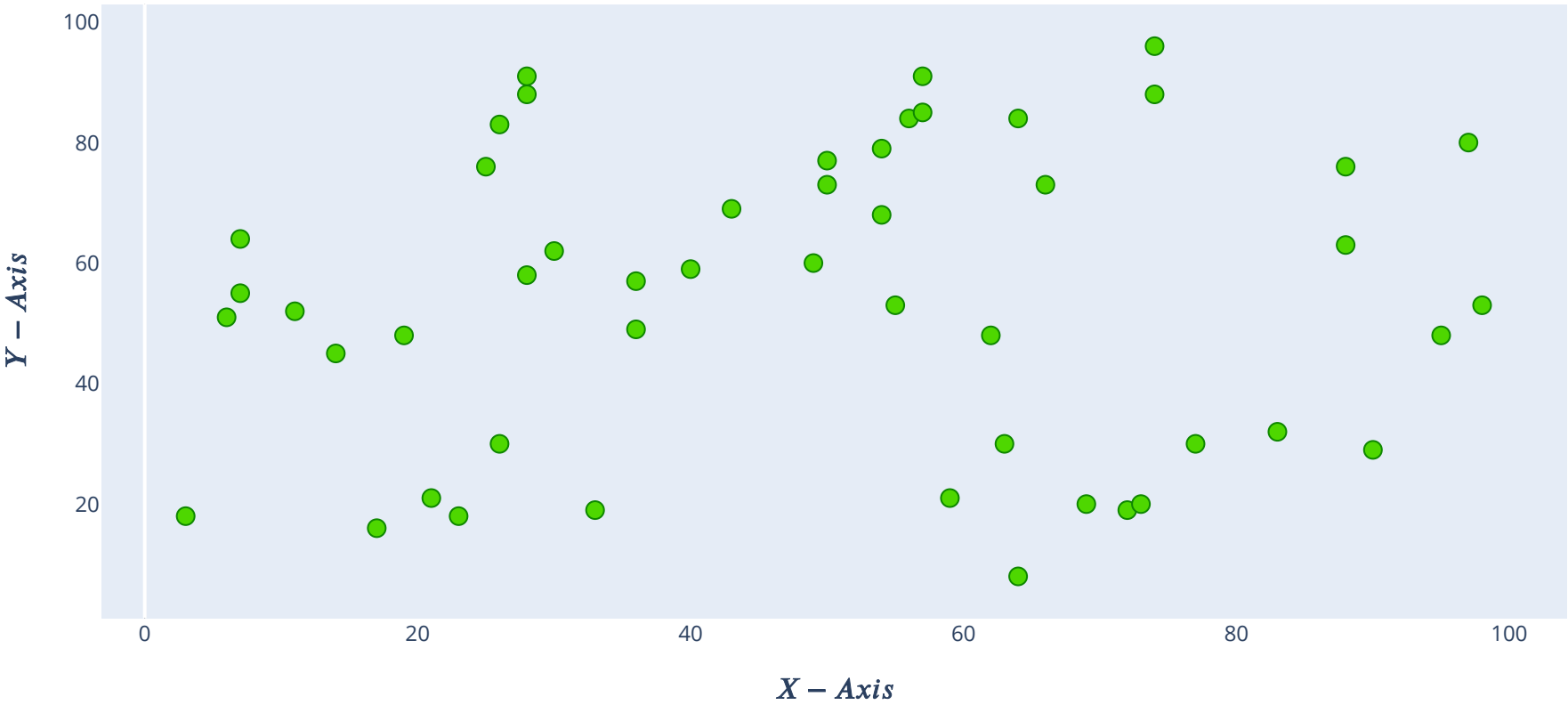
```
# Defining Labels (X-Axis & Y-Axis Label , Graph tile)
x_val = np.random.randint(1,100,50)
y_val = np.random.randint(1,100,50)

data = [go.Scatter(
    x = x_val,
    y = y_val,
    mode = 'markers',
    marker = dict(
        size = 10,
        color = '#4ED700',
        symbol = 'circle',
        line = dict(width = 1,color = '#0E8700')
    )
)]

layout = go.Layout(
    title = '$Scatter Plot$', # Title
    xaxis = dict(title = '$X-Axis$',showgrid=False,showline=False), # x-axis label
    yaxis = dict(title = '$Y-Axis$',showgrid=False,showline=False), # y-axis label
)

fig = go.Figure(data=data, layout=layout)
iplot(fig)
```

ScatterPlot



In [26]:

```
x_values = np.linspace(0, 100, 100) # 100 evenly spaced values
y_values = np.random.randn(100)      # 100 random values

trace0 = go.Scatter(
    x = x_values,
    y = y_values,
    mode = 'markers',
    marker = dict(
        size = 7,
        color = '#F4D03F',
        symbol = 'circle',
        line = dict(width = 1,color = '#0E8700')
    )
)

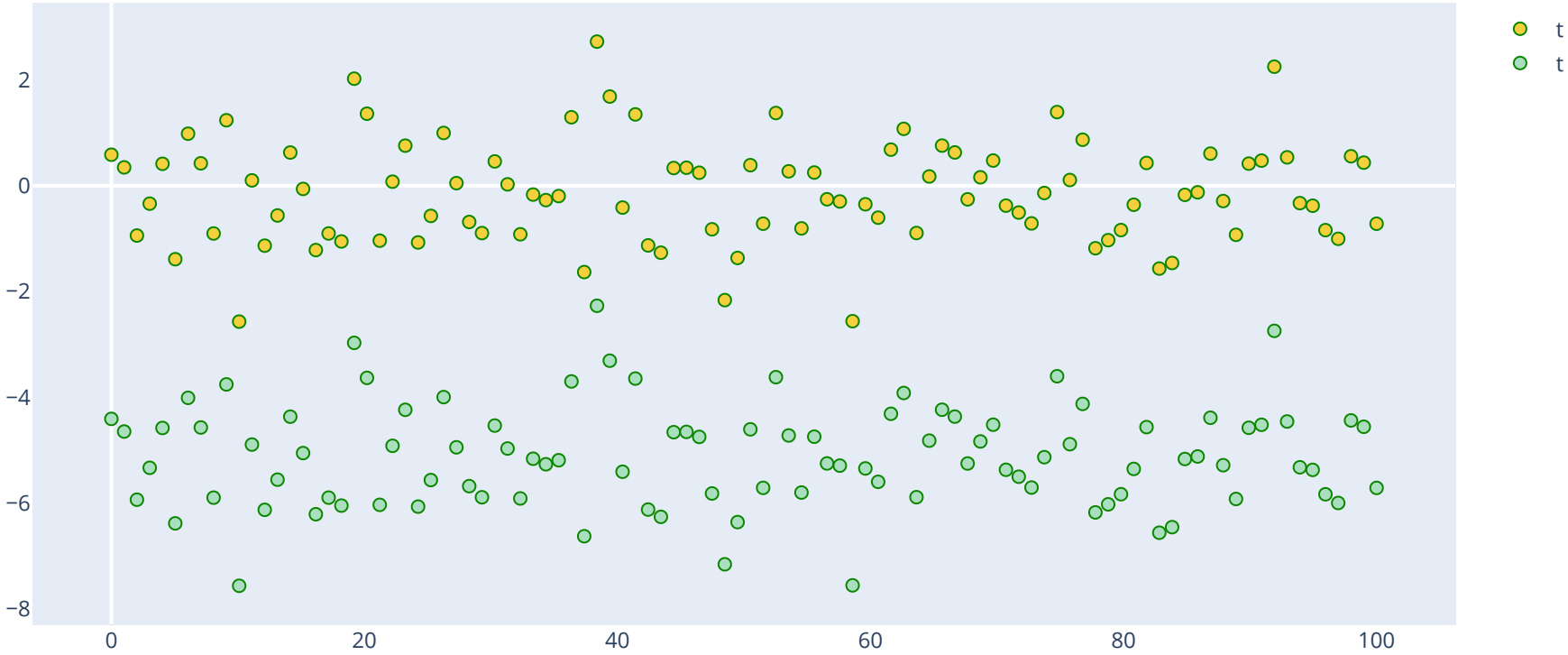
trace1 = go.Scatter(
    x = x_values,
    y = y_values-5,
    mode = 'markers',
    marker = dict(size = 7,
        color = '#A9DFBF',
        symbol = 'circle',
        line = dict(width = 1,color = '#0E8700')
    )
)

data = [trace0, trace1]

layout = go.Layout(
    xaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),

    yaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),
)

fig = go.Figure(data=data,layout=layout)
iplot(fig)
```



In [27]: `insurance.head(10)`

Out[27]:

	age	sex	bmi	children	smoker	region	charges
0	19	female	27.900	0	yes	southwest	16884.92400
1	18	male	33.770	1	no	southeast	1725.55230
2	28	male	33.000	3	no	southeast	4449.46200
3	33	male	22.705	0	no	northwest	21984.47061
4	32	male	28.880	0	no	northwest	3866.85520
5	31	female	25.740	0	no	southeast	3756.62160
6	46	female	33.440	1	no	southeast	8240.58960
7	37	female	27.740	3	no	northwest	7281.50560
8	37	male	29.830	2	no	northeast	6406.41070
9	60	female	25.840	0	no	northwest	28923.13692

```
In [28]: data = [go.Scatter(
    x = insurance.bmi,
    y = insurance.charges,
    mode = 'markers',
    marker = dict(size = 7,
                  color = '#4ED700',
                  symbol = 'circle',
                  line = dict(width = 1,color = '#0E8700')
    )
)

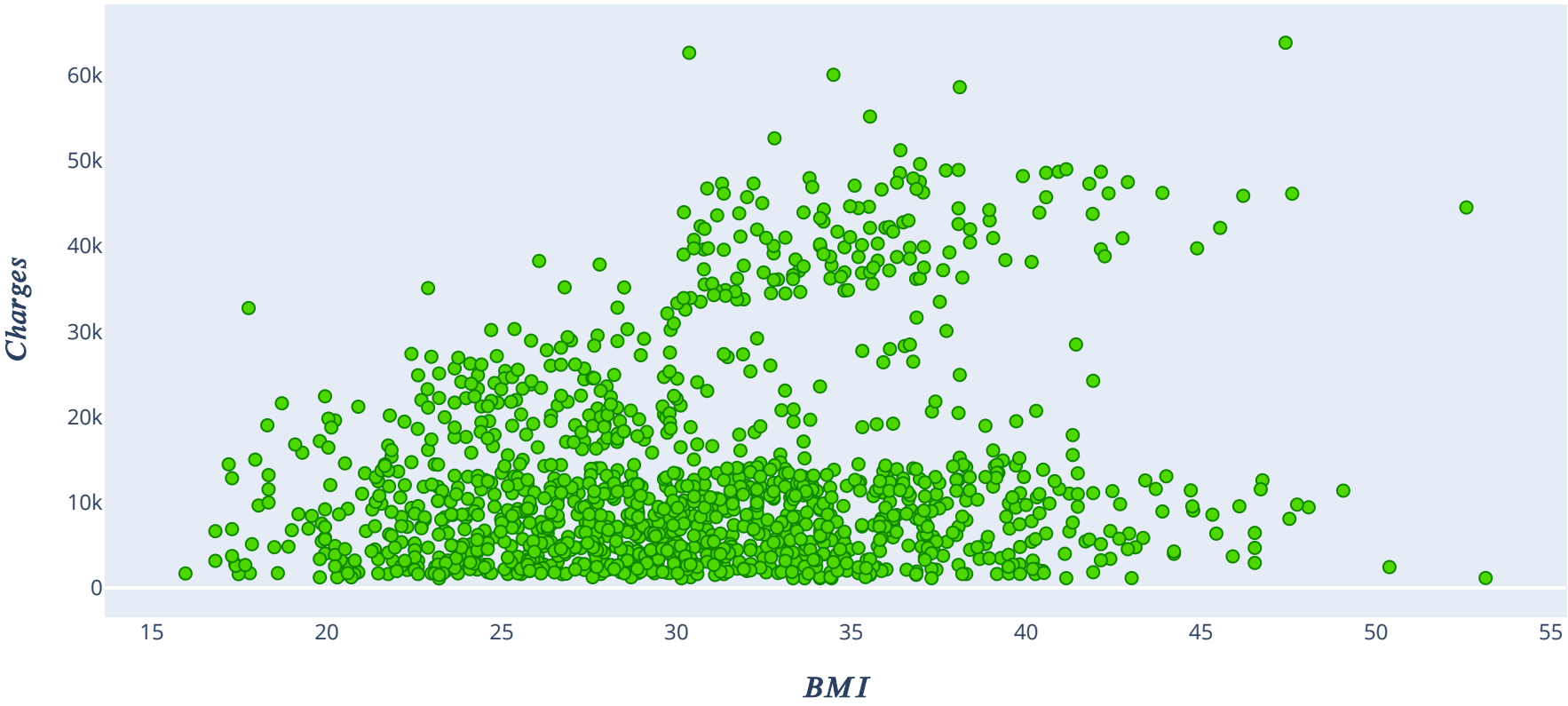
]

layout = go.Layout(
    title = '$Insurance$', # Chart Title
    xaxis = dict(title = '$BMI$',showgrid=False,showline=False), # x-axis Label
    yaxis = dict(title = '$Charges$',showgrid=False,showline=False), # y-axis Label
)

fig = go.Figure(data=data, layout=layout)

iplot(fig)
```

Insurance



```
In [29]: data = [go.Scatter(
    x = insurance.bmi,
    y = insurance.charges,
    mode = 'markers',
    marker = dict(size = 7,
        color = '#4ED700',
        symbol = 'circle',
        line = dict(width = 1,color = '#0E8700')
    )
]

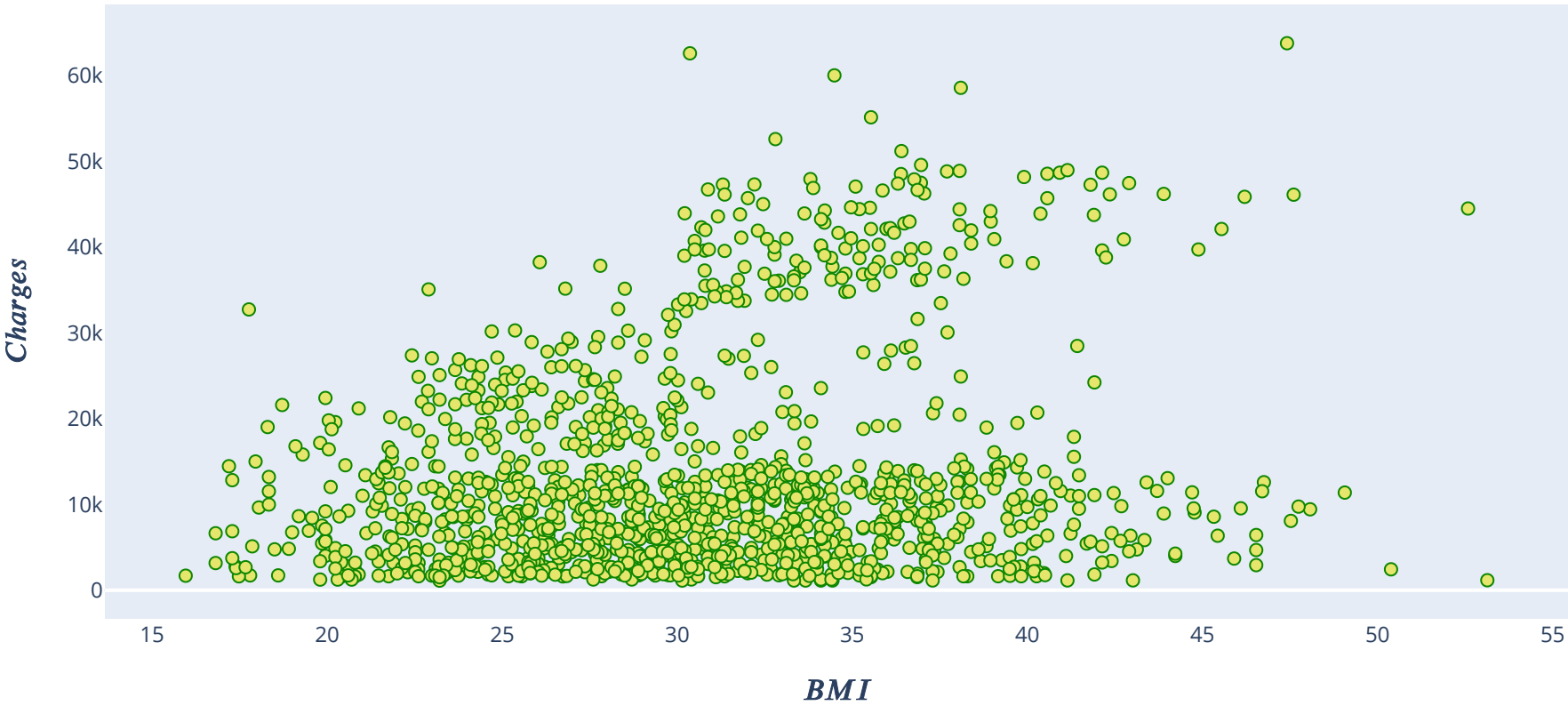
layout = go.Layout(
    title = '$Insurance$', # Title
    xaxis = dict(title = '$BMI$',showgrid=False,showline=False), # x-axis label
    yaxis = dict(title = '$Charges$',showgrid=False,showline=False), # y-axis label
)

fig = go.Figure(data=data, layout=layout)

# Updating Traces
fig.update_traces(
    marker=dict(color="#e6e56c"),
)

iplot(fig)
```

Insurance



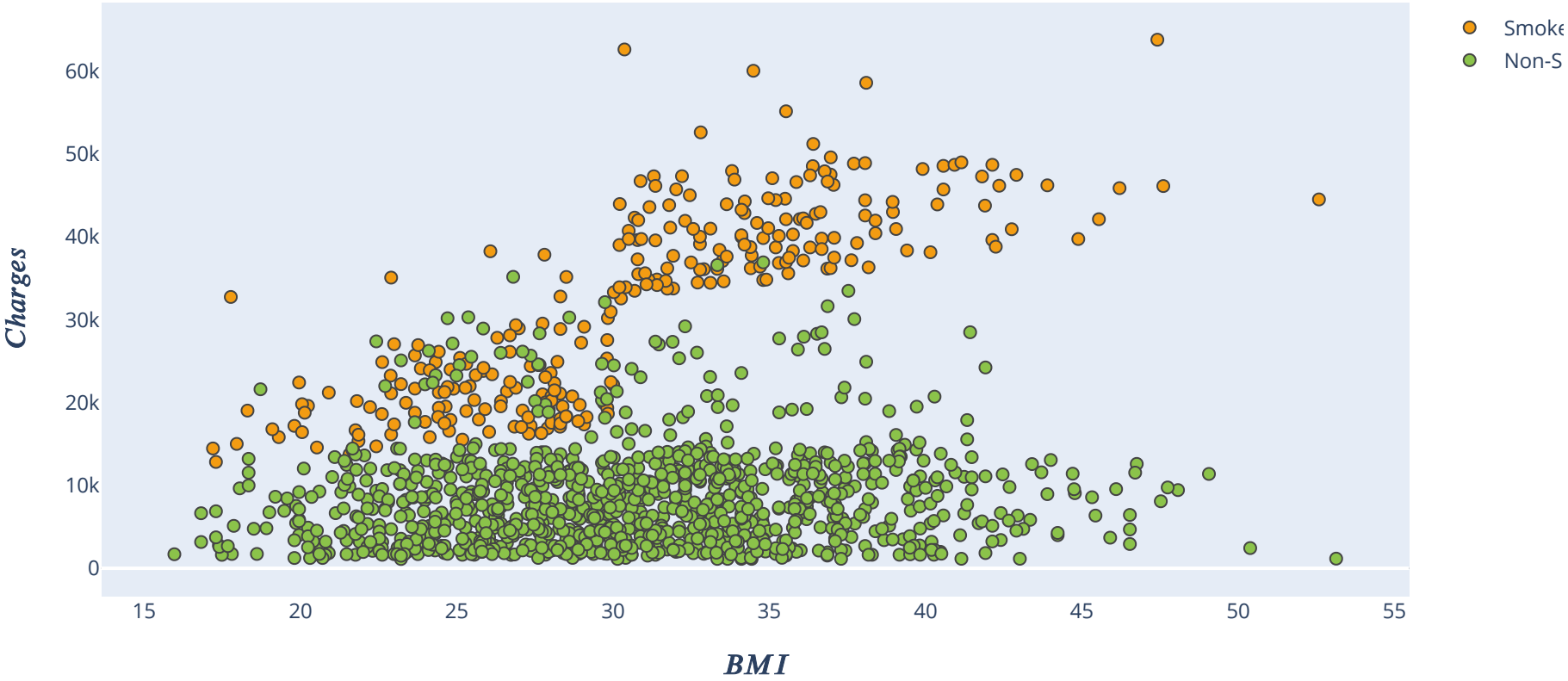
```
In [30]: # trace0 will capture all smokers
trace0 = go.Scatter(
    x = insurance[insurance.smoker=='yes'].bmi,
    y = insurance[insurance.smoker=='yes'].charges,
    mode = 'markers',
    name = 'Smoker',
    marker = dict(size = 7, color = '#F39C12',symbol = 'circle',line = dict(width = 1))
)

# trace1 will capture all non-smokers
trace1 = go.Scatter(
    x = insurance[insurance.smoker=='no'].bmi,
    y = insurance[insurance.smoker=='no'].charges,
    mode = 'markers',
    name = 'Non-Smoker',
    marker = dict(size = 7, color = '#8BC34A',symbol = 'circle',line = dict(width = 1))
)

layout = go.Layout(
    title = '$Scatter Plot$', # Title
    xaxis = dict(title = '$BMI$',showgrid=False,showline=False), # x-axis label
    yaxis = dict(title = '$Charges$',showgrid=False,showline=False), # y-axis label
)

data = [trace0, trace1]
fig = go.Figure(data=data,layout=layout)
iplot(fig)
```

ScatterPlot



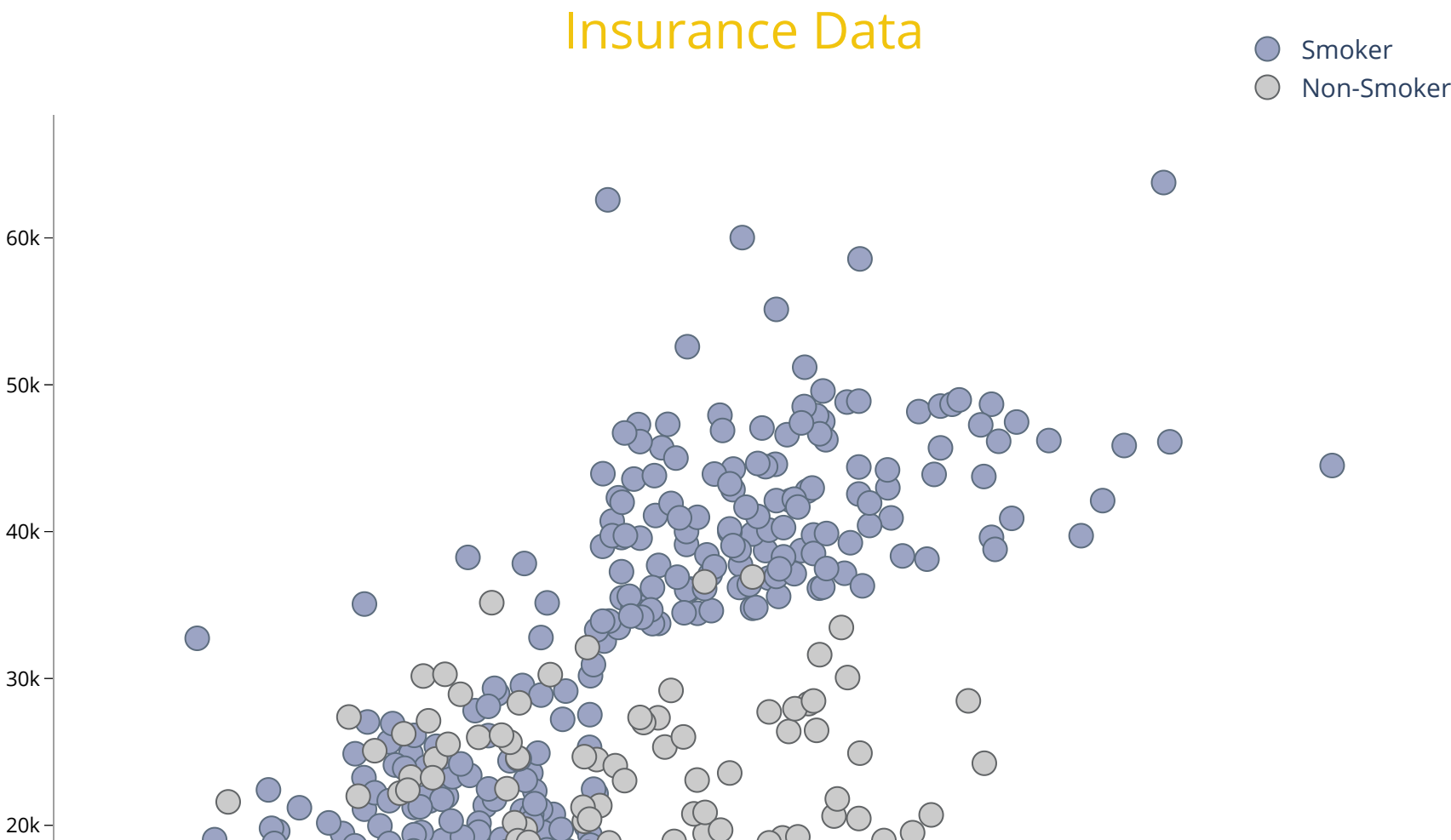
In [31]:

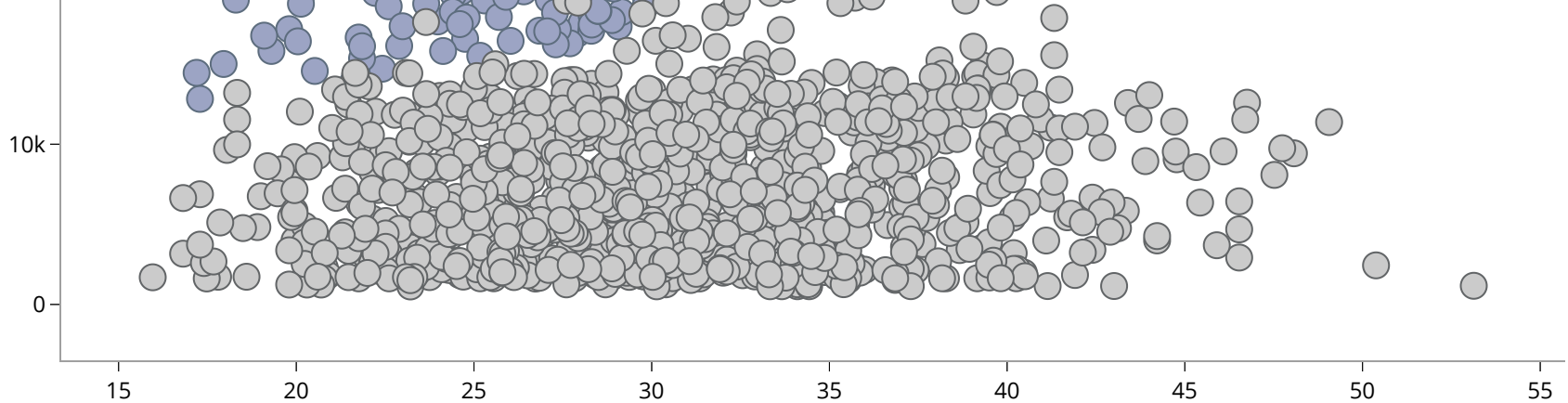
```
# trace0 will capture all smokers
trace0 = go.Scatter(
    x = insurance[insurance.smoker=='yes'].bmi,
    y = insurance[insurance.smoker=='yes'].charges,
    mode = 'markers',
    name = 'Smoker',
    marker = dict(size = 14, color = '#9ca4c4',symbol = 'circle',
                  line = dict(width = 1,color = '#5D6D7E'))
)

# trace1 will capture all non-smokers
trace1 = go.Scatter(
    x = insurance[insurance.smoker=='no'].bmi,
    y = insurance[insurance.smoker=='no'].charges,
    mode = 'markers',
    name = 'Non-Smoker',
    marker = dict(size = 14, color = '#cbcbcb',symbol = 'circle',
                  line = dict(width = 1,color = '#626567'))
)

#Layout Setting
layout = go.Layout(
    title=dict(text = "Insurance Data",x=0.5,y=0.95),
    title_font_size=30,
    title_font_color='#F1C40F',
    xaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=True, # Show X-Axis
        linecolor='black', # Color of X-axis
        tickfont_color='black', #Color of ticks
        showticklabels=True, #Show X Labels
        dtick=5,
        ticks='outside',
        tickcolor='black',
    ),
    yaxis=dict(
        showgrid=False,
        showline=True,
        linecolor='black',
        tickfont_color='black',
        showticklabels=True,
        ticks='outside',
        tickcolor='black',
    ),
    legend=dict(
        font_size=15,
        yanchor='bottom',
        xanchor='right',
    ),
    paper_bgcolor='white',
    plot_bgcolor='white',
    hovermode='closest',
    width=970,
    height=800,
)

data = [trace0, trace1]
fig = go.Figure(data=data,layout=layout)
iplot(fig)
```





```
In [32]: # Display multiple Scatter plots in one figure using Subplots

from plotly.subplots import make_subplots

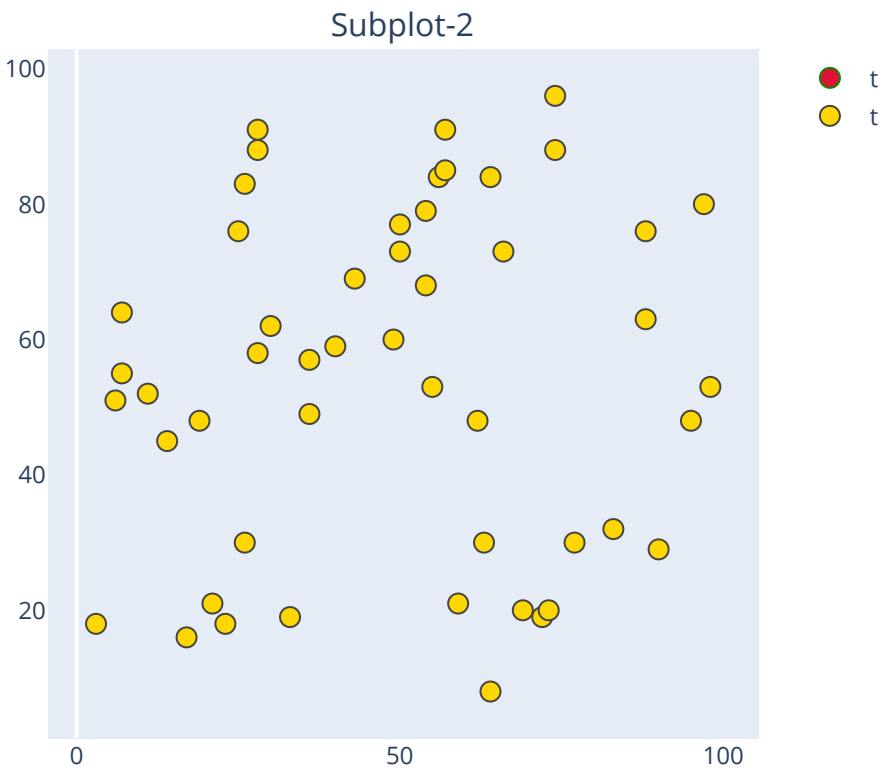
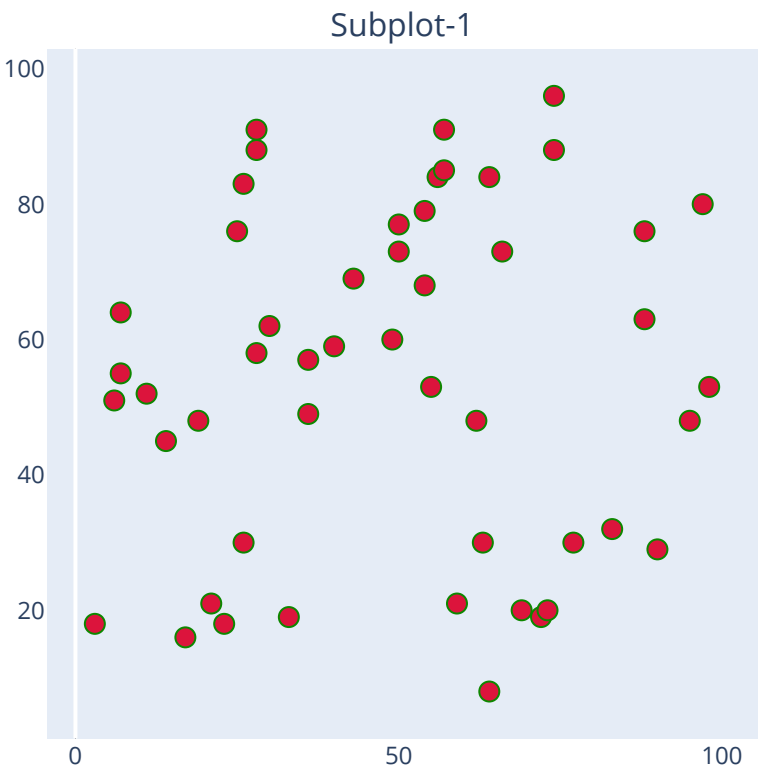
#Subplot initialization
fig = make_subplots(
    rows=1,
    cols=2,
    subplot_titles=("Subplot-1", "Subplot-2")
)

# Subplot - 1 (Add graph object trace to a figure)
fig.add_trace(go.Scatter
    (
        x = x_val,
        y = y_val,
        mode = 'markers',
        marker = dict(size = 10, color = 'crimson',symbol = 'circle',line = dict(width = 1,color = '#0E8700')
    ),
    row=1, col=1
)

# Add graph object trace to a figure (Subplot-2)
fig.add_trace(go.Scatter
    (
        x = x_val,
        y = y_val,
        mode = 'markers',
        marker = dict(size = 10, color = 'gold',symbol = 'circle',line = dict(width = 1))
    ),
    row=1, col=2
)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```



```
In [33]: # Display multiple Scatter plots in one figure using Subplots

from plotly.subplots import make_subplots

#Subplot initialization
fig = make_subplots(
    rows=1,
    cols=2,
    subplot_titles=("Subplot-1", "Subplot-2")
)

# Subplot - 1 (Add graph object trace to a figure)
fig.add_trace(go.Scatter
    (
        x = x_val,
        y = y_val,
        mode = 'markers',
        marker = dict(size = 10, color = '#4ED700',symbol = 'circle',line = dict(width = 1,color = '#0E8700')
    ),
    row=1, col=1
)

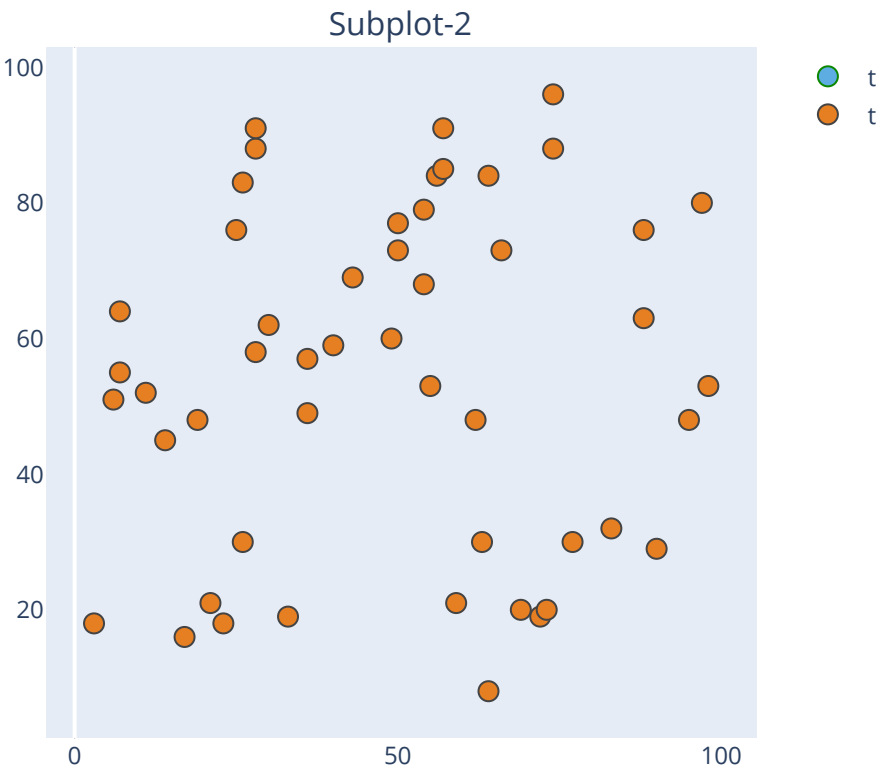
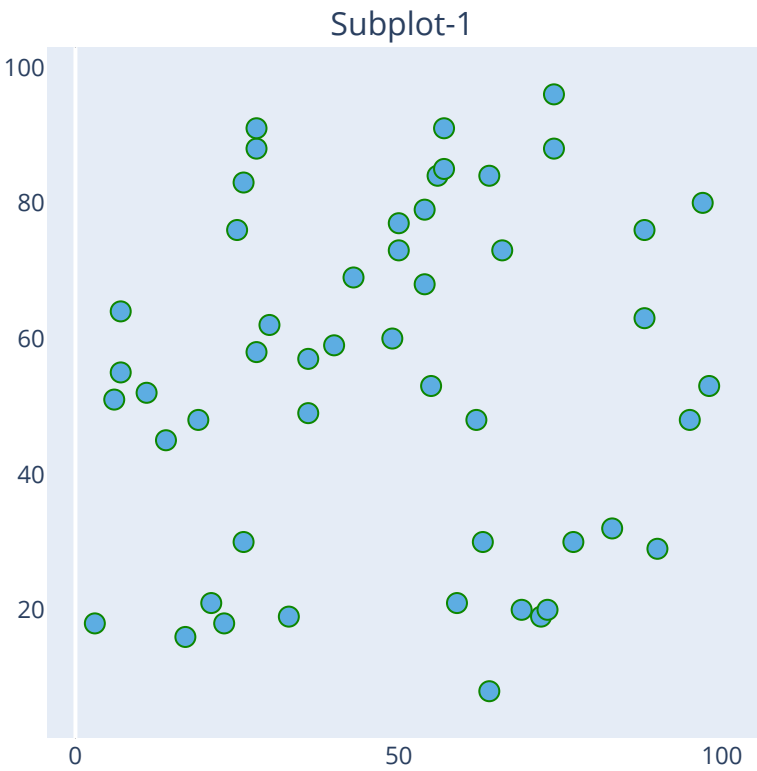
# Add graph object trace to a figure
fig.add_trace(go.Scatter
    (
        x = x_val,
        y = y_val,
        mode = 'markers',
        marker = dict(size = 10, color = '#FFC107',symbol = 'circle',line = dict(width = 1))
    ),
    row=1, col=2
)

#Update traces in Suplots
fig.update_traces(
    marker=dict(color="#5DADE2"),
    col=1,
    row = 1
)

#Update traces in Suplots
fig.update_traces(
    marker=dict(color="#E67E22"),
    col=2,
    row = 1
)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```



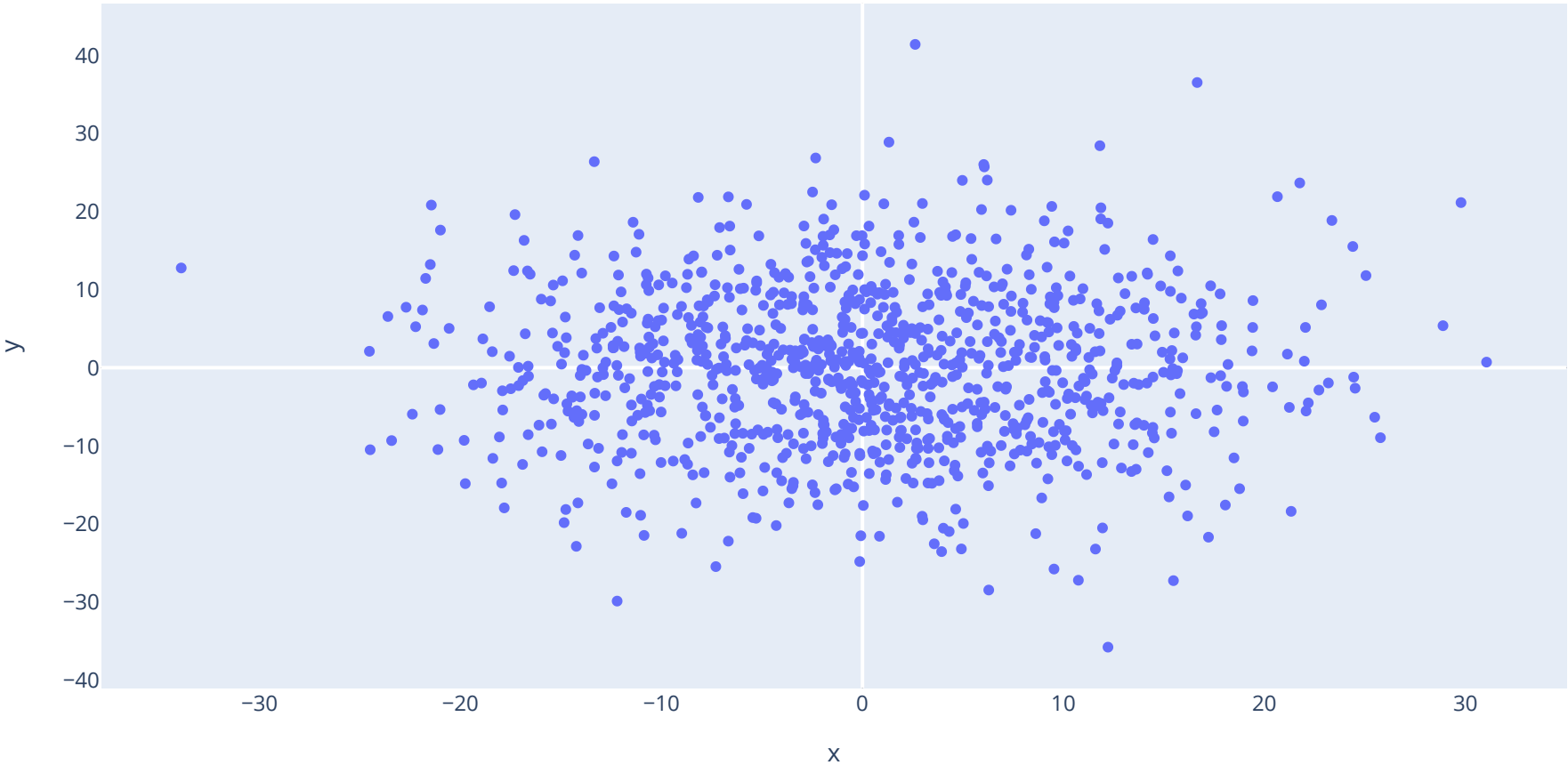
▼ **Scatter Plot using Plotly Express**


```
In [44]: xval = np.random.normal(0,10,1000)
yval = np.random.normal(0,10,1000)
fig = px.scatter(x=xval,y= yval)

fig.update_layout(
    xaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),

    yaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),
)

fig.show()
```

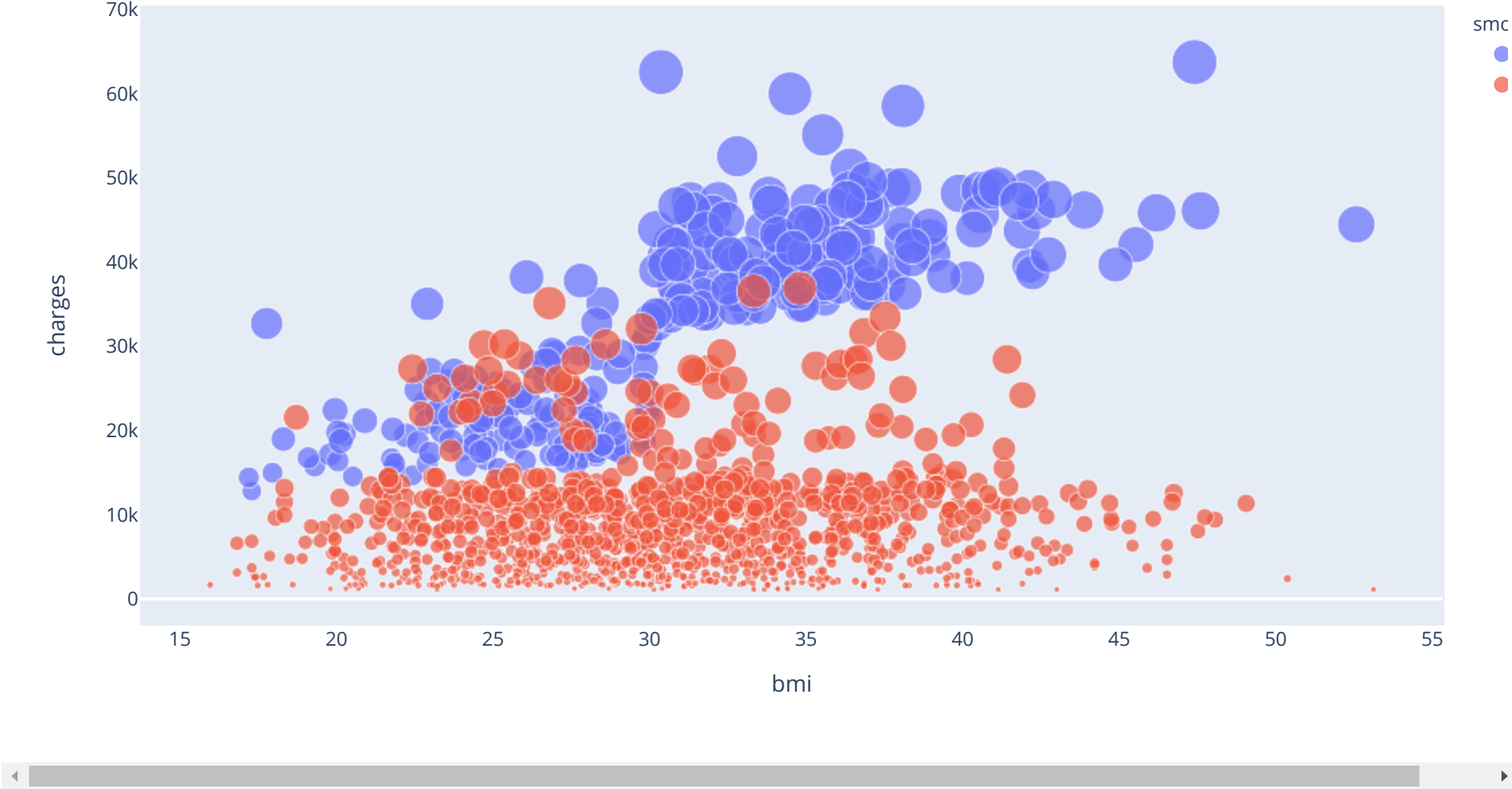



```
In [57]: fig = px.scatter(
    insurance,
    x=insurance.bmi,
    y= insurance.charges,
    color="smoker", # Show groups with different colors using "color" parameter
    size=insurance.charges
)

fig.update_layout(
    xaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),

    yaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),
)

fig.show()
```

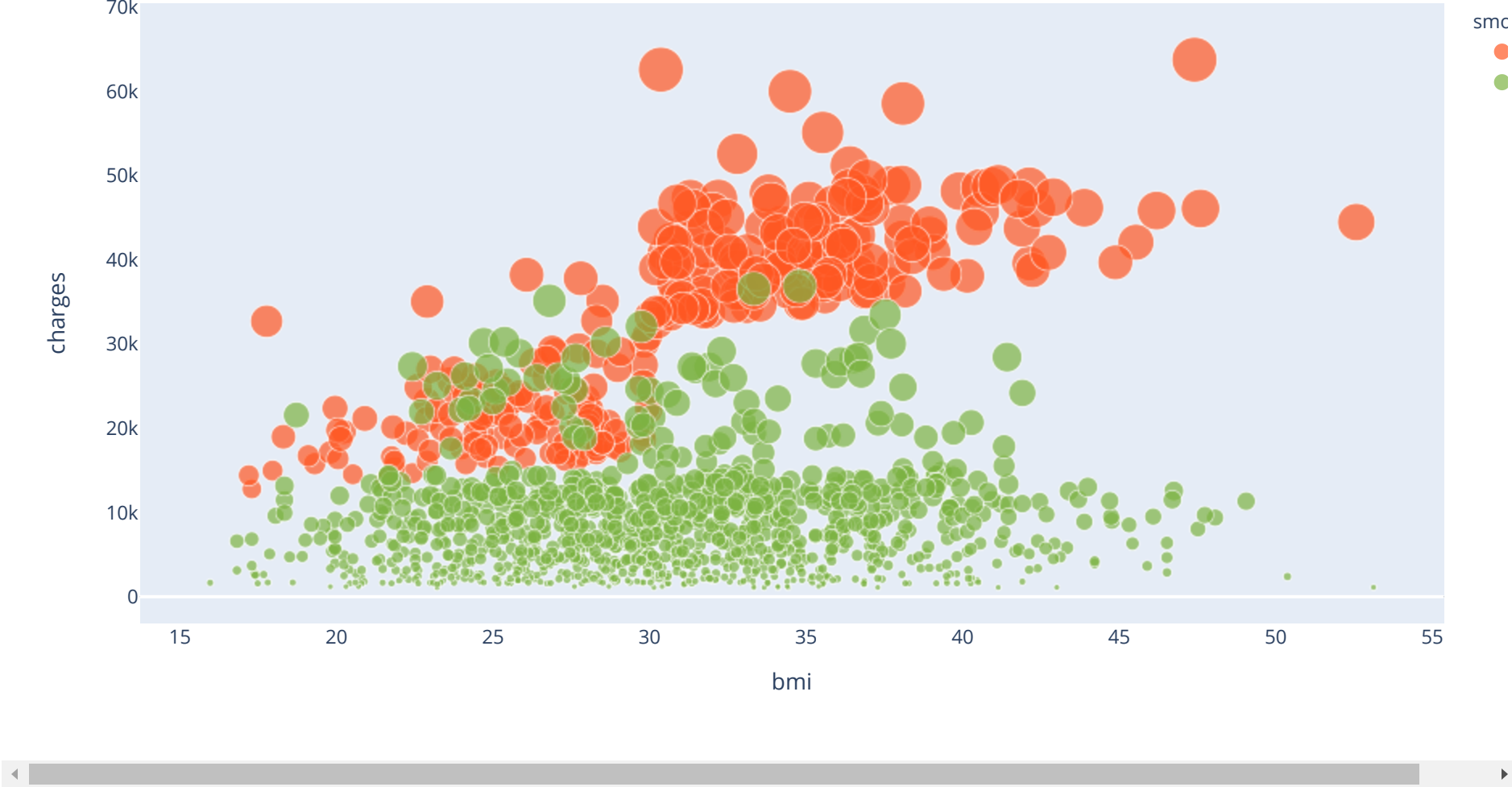


```
In [46]: fig = px.scatter(insurance,
                        x=insurance.bmi,
                        y= insurance.charges,
                        color="smoker", # Show groups with different colors using "color" parameter
                        size=insurance.charges,
                        color_discrete_map={"yes": "#FF5722","no": "#7CB342"} #Map colors to data values
                        )

fig.update_layout(
    xaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),

    yaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),
)

fig.show()
```



```
In [51]: # Using facet_col arguments to create Sub plots
fig = px.scatter(insurance,
                 x=insurance.bmi,
                 y=insurance.charges,
                 color=insurance.smoker, # Show groups with different colors using "color" parameter
                 facet_col=insurance.region, # Using facet_col arguments to create Sub plots
                 color_discrete_map={"yes": "#FF5722","no": "#7CB342"}, #Map colors to data values
                 title="Insurance Data"
                )

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

Insurance Data



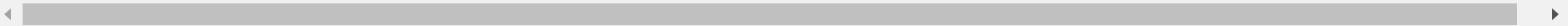
```
In [54]: # Using facet_row and or facet_col arguments to create Sub plots
fig = px.scatter(insurance,
                 x=insurance.bmi,
                 y=insurance.charges,
                 color=insurance.smoker,
                 facet_col=insurance.region, # Using facet_col argument to create Sub plots
                 facet_row=insurance.sex, # Using facet_row argument to create Sub plots
                 color_discrete_map={"yes": "#FF5722","no": "#7CB342"},
                 width=950,
                 height=800,
                 title="Insurance Data")

fig.update_layout(
    plot_bgcolor= "#dcedc1",
    paper_bgcolor="#FFFDE7",
)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

Insurance Data



```
In [55]: # Using facet_row and or facet_col arguments to create Sub plots
fig = px.scatter(insurance,
                  x=insurance.bmi,
                  y=insurance.charges,
                  color=insurance.smoker,
                  facet_col=insurance.region,
                  facet_row=insurance.sex,
                  color_discrete_map={"yes": "#FF5722", "no": "#7CB342"},
                  width=950,
                  height=800,
                  title="Insurance Data")

fig.update_layout(
    plot_bgcolor= "#dcedc1",
    paper_bgcolor="#FFFDE7",
)

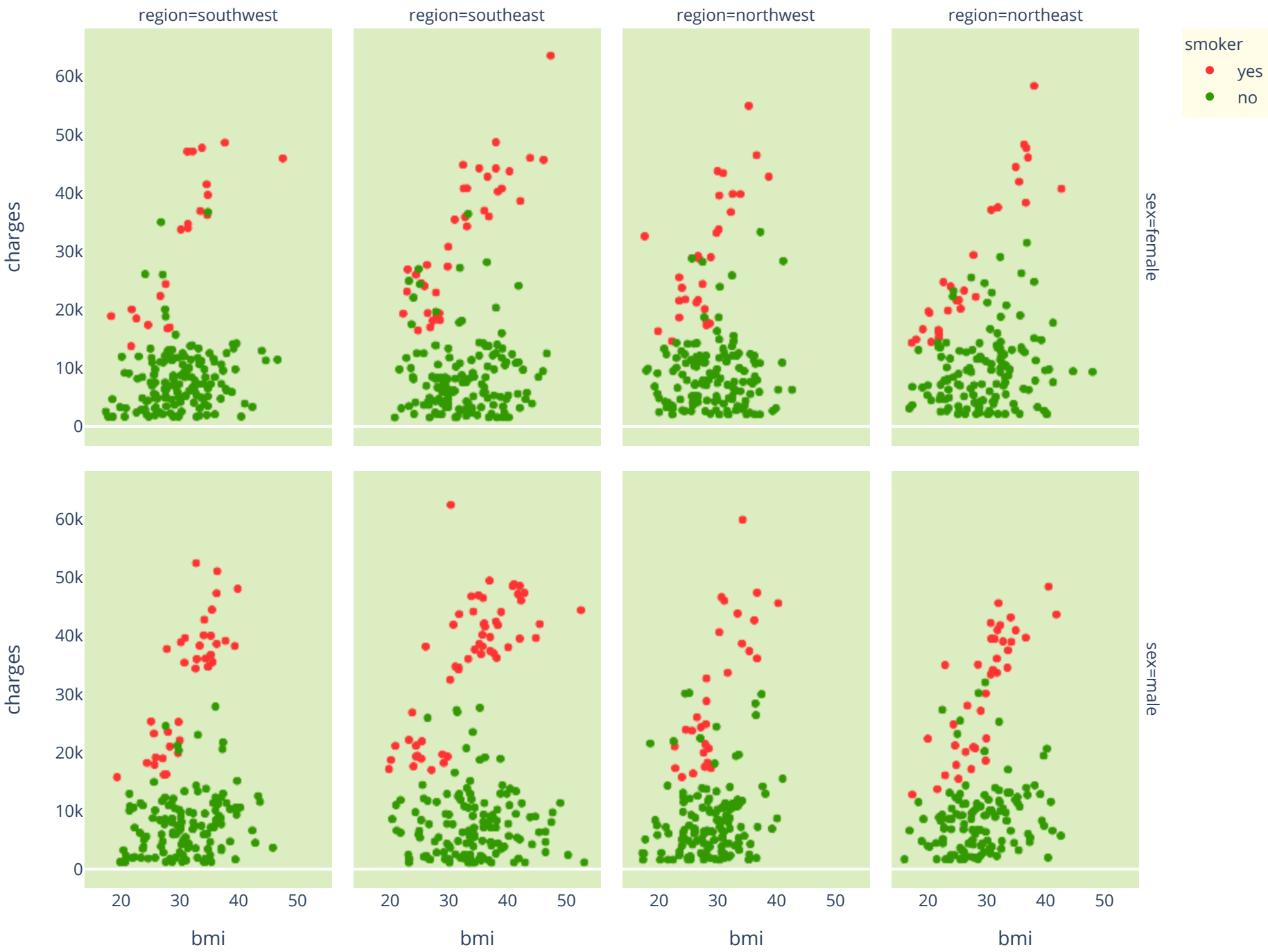
# Updating Traces using "selector" argument
fig.update_traces(
    marker_color="#339900",
    selector=dict(marker_color="#7CB342")
)

# Updating Traces using "selector" argument
fig.update_traces(
    marker_color="#FF3333",
    selector=dict(marker_color="#FF5722")
)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
#po.plot(fig)
```

Insurance Data



Line Plot

In [59]:

```
#Simple Line Plot

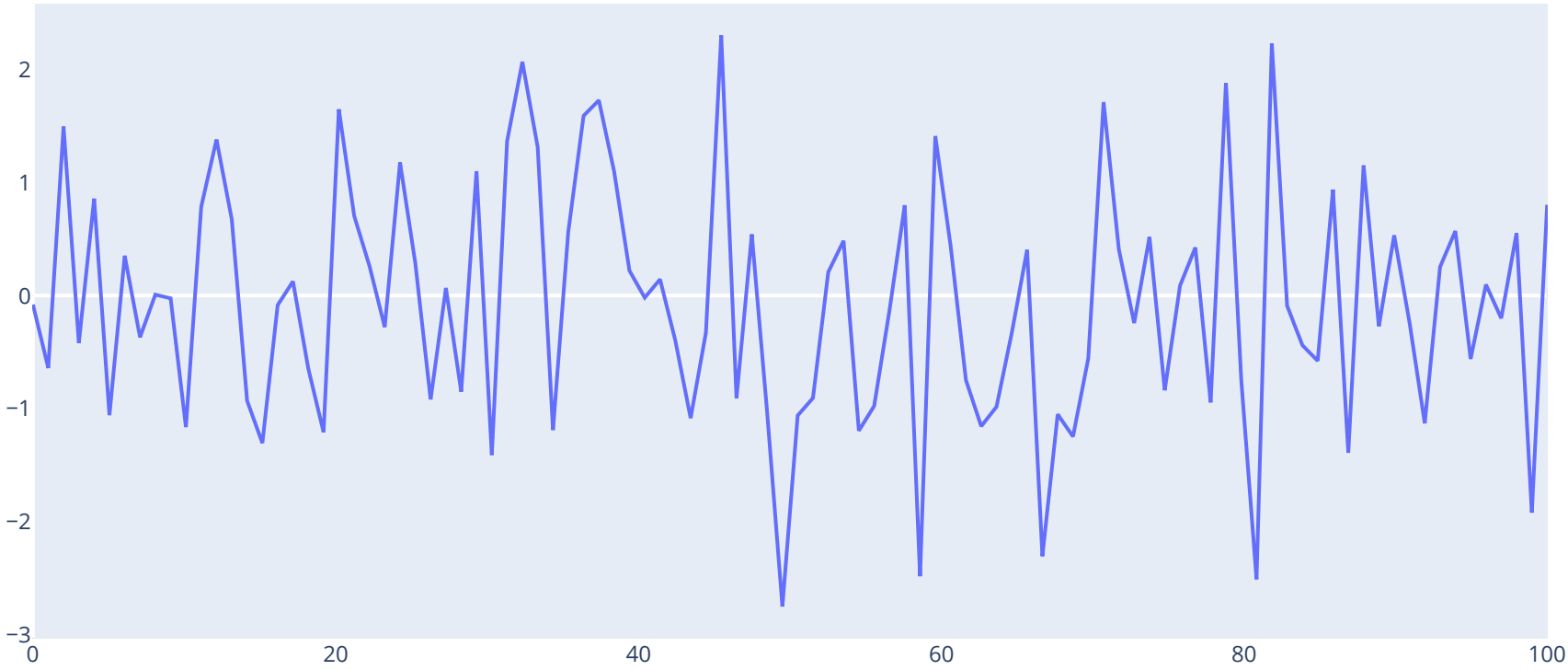
x_values = np.linspace(0, 100, 100) # 100 evenly spaced values
y_values = np.random.randn(100)     # 100 random values

# create traces
trace0 = go.Scatter(
    x = x_values,
    y = y_values,
    mode = 'lines',
)

layout = go.Layout(
    xaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),

    yaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),
)

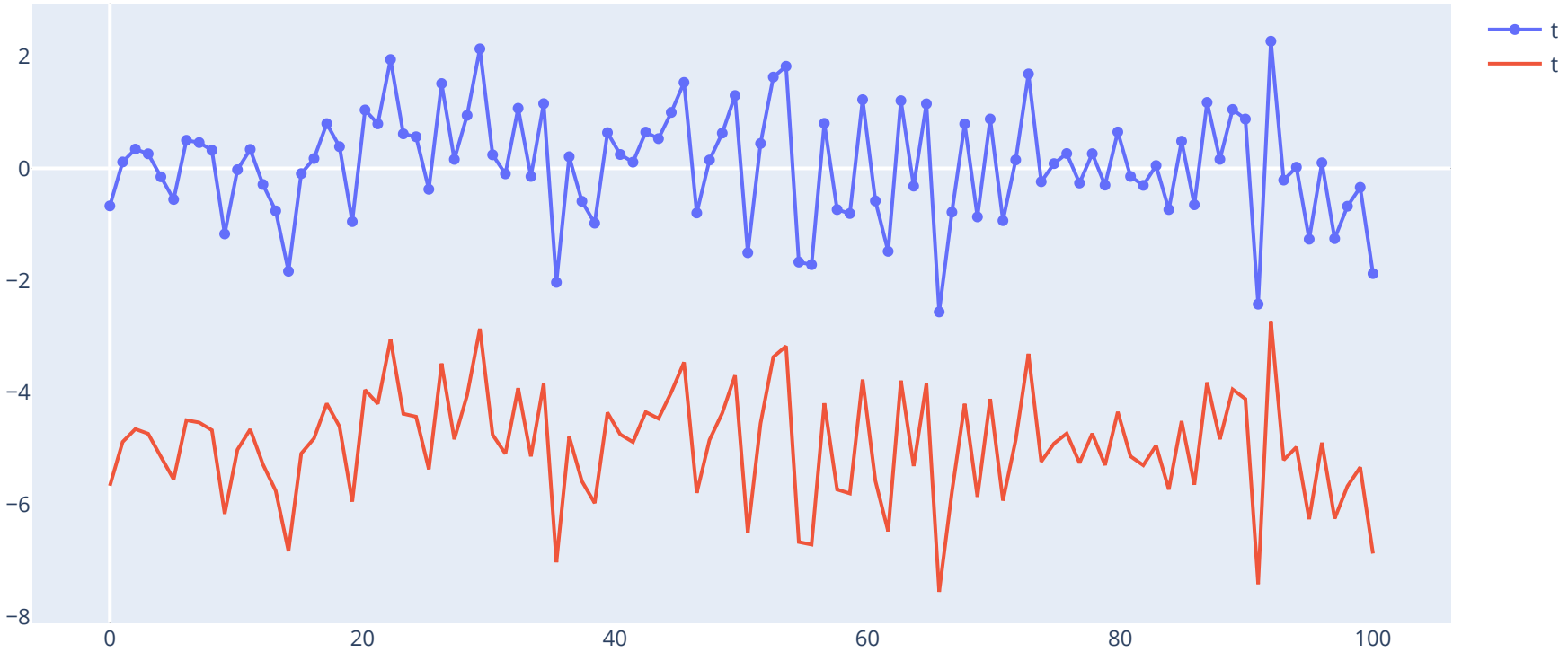
fig = go.Figure(data=trace0,layout=layout)
iplot(fig)
```



```
In [60]: #Line Styling

x_values = np.linspace(0, 100, 100) # 100 evenly spaced values
y_values = np.random.randn(100)     # 100 random values

trace0 = go.Scatter(
    x = x_values,
    y = y_values,
    mode = 'lines+markers',
)
trace1 = go.Scatter(
    x = x_values,
    y = y_values-5,
    mode = 'lines',
)
data = [trace0, trace1]
fig = go.Figure(data=data,layout=layout)
iplot(fig)
```



```
In [350]: canada.head()
```

Out[350]:

	Afghanistan	Albania	Algeria	American Samoa	Andorra	Angola	Antigua and Barbuda	Argentina	Armenia	Australia	...	Uzbekistan	Vanuatu	Venezuela (Bolivarian Republic of)	Viet Nam
1980	16	1	80	0	0	1	0	368	0	702	...	0	0	103	1191
1981	39	0	67	1	0	3	0	426	0	639	...	0	0	117	1829
1982	39	0	71	0	0	6	0	626	0	484	...	0	0	174	2162
1983	47	0	69	0	0	6	0	241	0	317	...	0	0	124	3404
1984	71	0	63	0	0	4	42	237	0	317	...	0	0	142	7583

5 rows × 197 columns

```
In [61]: # Plot Immigrants from China
china = go.Scatter(
    x = canada.index.values,
    y = canada['China'],
    mode = 'lines',
    name = 'China'
)

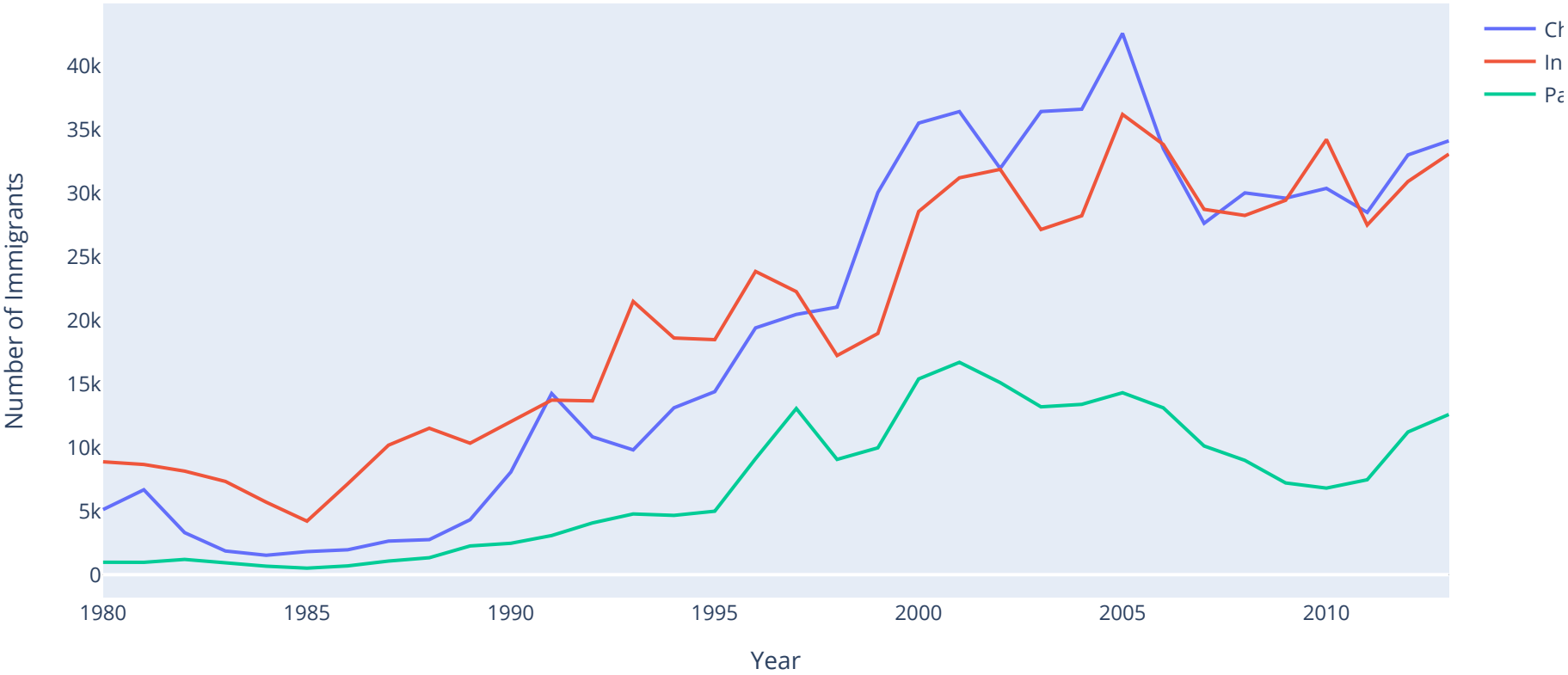
#Plot Immigrants from India
india = go.Scatter(
    x = canada.index.values,
    y = canada['India'],
    mode = 'lines',
    name = 'India'
)

#Plot Immigrants from Pakistan
pakistan = go.Scatter(
    x = canada.index.values,
    y = canada['Pakistan'],
    mode = 'lines',
    name = 'Pakistan'
)

# Layout setting
layout = go.Layout(
    title = '$Immigrants$', # Title
    xaxis = dict(title = 'Year',showgrid=False,showline=False), # x-axis label
    yaxis = dict(title = 'Number of Immigrants',showgrid=False,showline=False), # y-axis label
)

data = [china, india,pakistan]
fig = go.Figure(data=data,layout=layout)
iplot(fig)
```

Immigrants




```
In [63]: # Plot Immigrants from China
china = go.Scatter(
    x = canada.index.values,
    y = canada['China'],
    mode = 'lines',
    name = 'China'
)

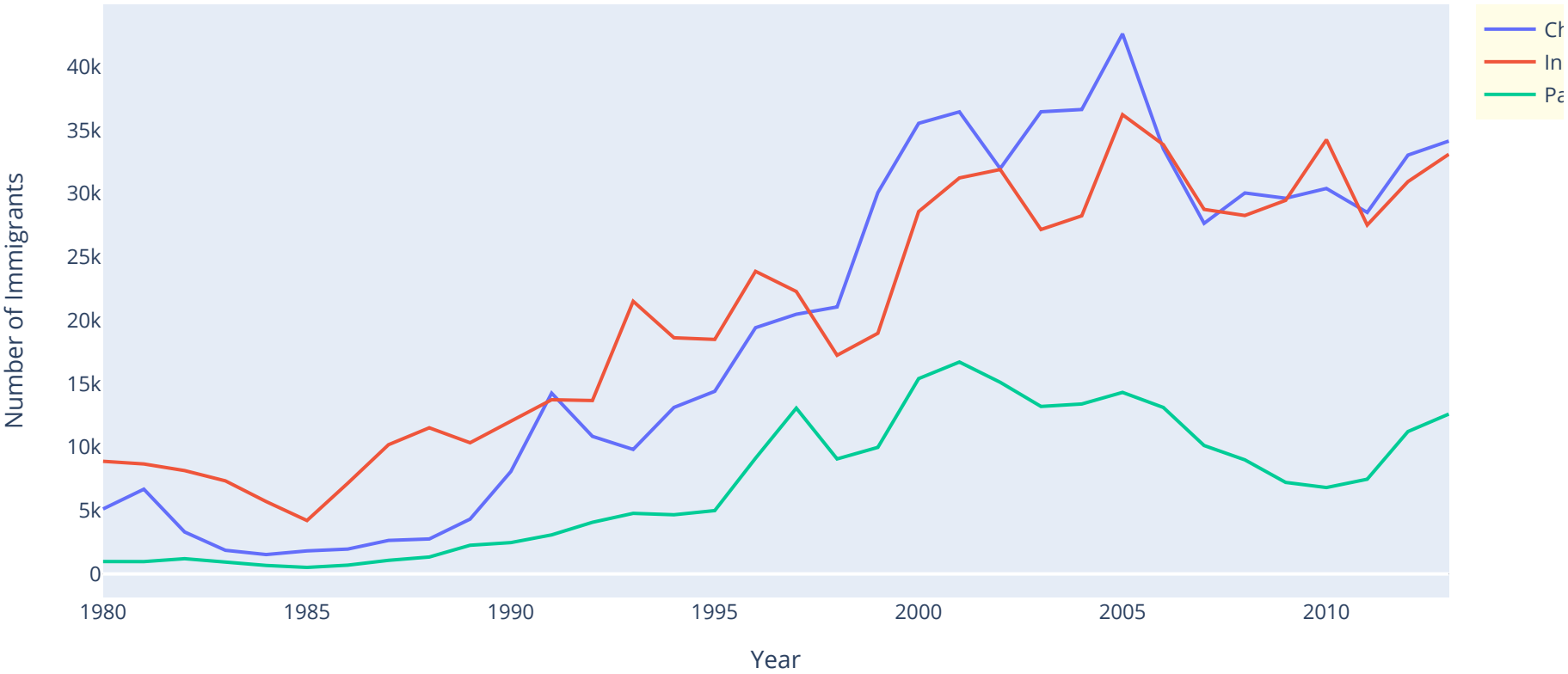
# Plot Immigrants from India
india = go.Scatter(
    x = canada.index.values,
    y = canada['India'],
    mode = 'lines',
    name = 'India'
)

# Plot Immigrants from Pakistan
pakistan = go.Scatter(
    x = canada.index.values,
    y = canada['Pakistan'],
    mode = 'lines',
    name = 'Pakistan'
)

layout = go.Layout(
    title = '$Immigrants$', # Title
    xaxis = dict(title = 'Year',showgrid=False,showline=False), # x-axis label
    yaxis = dict(title = 'Number of Immigrants',showgrid=False,showline=False), # y-axis label
    paper_bgcolor= '#FFFDE7' # Paper background color
)

data = [china, india,pakistan]
fig = go.Figure(data=data,layout=layout)
iplot(fig)
```

Immigrants



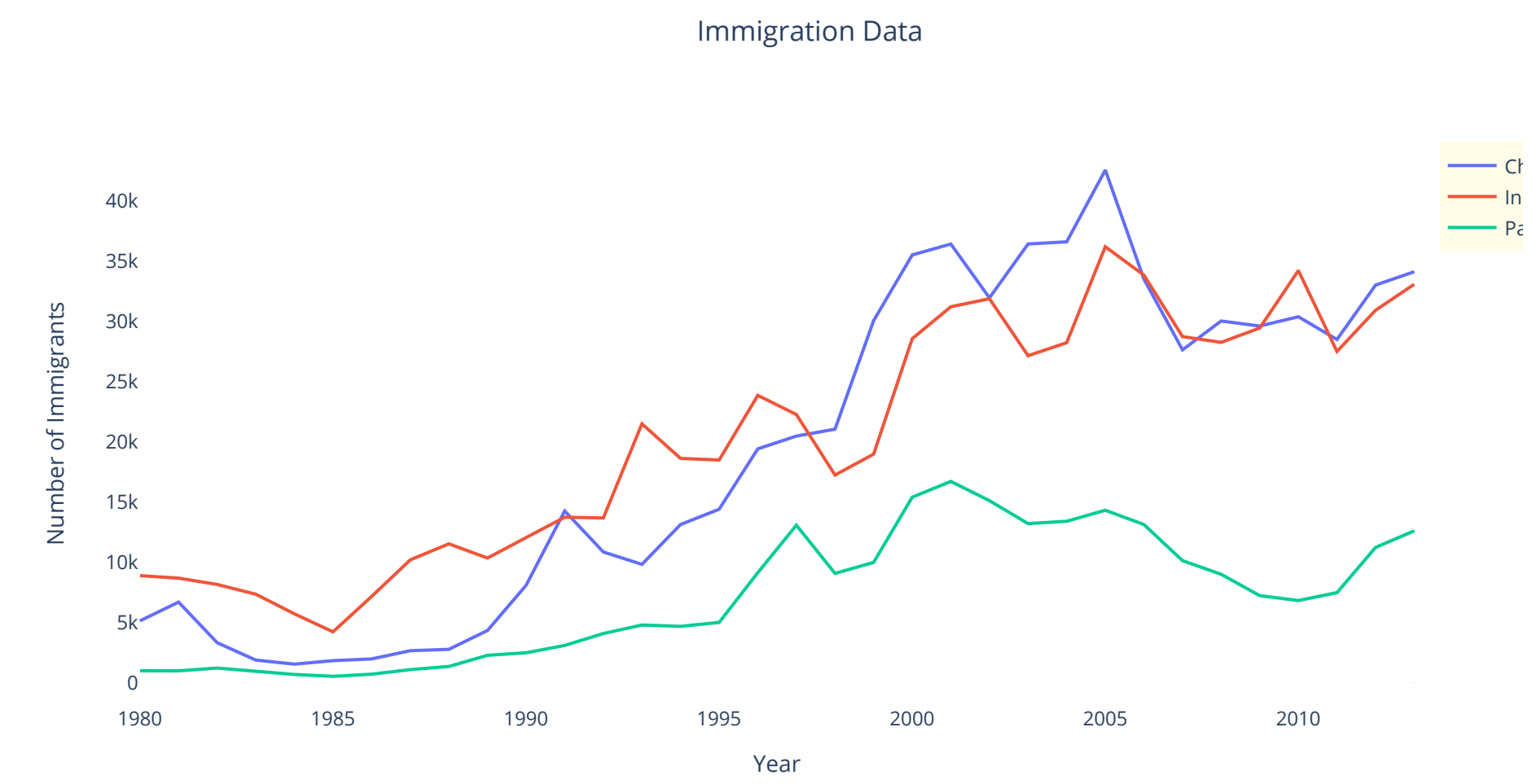
```
In [64]: # Plot Immigrants from China
china = go.Scatter(
    x = canada.index.values,
    y = canada['China'],
    mode = 'lines',
    name = 'China'
)

# Plot Immigrants from India
india = go.Scatter(
    x = canada.index.values,
    y = canada['India'],
    mode = 'lines',
    name = 'India'
)

# Plot Immigrants from Pakistan
pakistan = go.Scatter(
    x = canada.index.values,
    y = canada['Pakistan'],
    mode = 'lines',
    name = 'Pakistan'
)

layout = go.Layout(
    title=dict(text = "Immigration Data",x=0.5,y=0.95),
    xaxis = dict(title = 'Year',showgrid=False,showline=False), # x-axis label
    yaxis = dict(title = 'Number of Immigrants',showgrid=False,showline=False), # y-axis label
    paper_bgcolor= '#FFFDE7',
    plot_bgcolor= '#FFFDE7'
)

data = [china, india,pakistan]
fig = go.Figure(data=data,layout=layout)
iplot(fig)
```



```
In [65]: canada1 = canada.copy()
del canada1['Unknown']
del canada1['Total']
canada1.head()
```

Out[65]:

	Afghanistan	Albania	Algeria	American Samoa	Andorra	Angola	Antigua and Barbuda	Argentina	Armenia	Australia	...	United States of America	Uruguay	Uzbekistan	Vanuatu
1980	16	1	80	0	0	1	0	368	0	702	...	9378	128	0	0
1981	39	0	67	1	0	3	0	426	0	639	...	10030	132	0	0
1982	39	0	71	0	0	6	0	626	0	484	...	9074	146	0	0
1983	47	0	69	0	0	6	0	241	0	317	...	7100	105	0	0
1984	71	0	63	0	0	4	42	237	0	317	...	6661	90	0	0

5 rows × 195 columns

In [66]:

canada.head()

Out[66]:

	Afghanistan	Albania	Algeria	American Samoa	Andorra	Angola	Antigua and Barbuda	Argentina	Armenia	Australia	...	Uzbekistan	Vanuatu	Venezuela (Bolivarian Republic of)	Viet Nam
1980	16	1	80	0	0	1	0	368	0	702	...	0	0	103	1191
1981	39	0	67	1	0	3	0	426	0	639	...	0	0	117	1829
1982	39	0	71	0	0	6	0	626	0	484	...	0	0	174	2162
1983	47	0	69	0	0	6	0	241	0	317	...	0	0	124	3404
1984	71	0	63	0	0	4	42	237	0	317	...	0	0	142	7583

5 rows × 197 columns

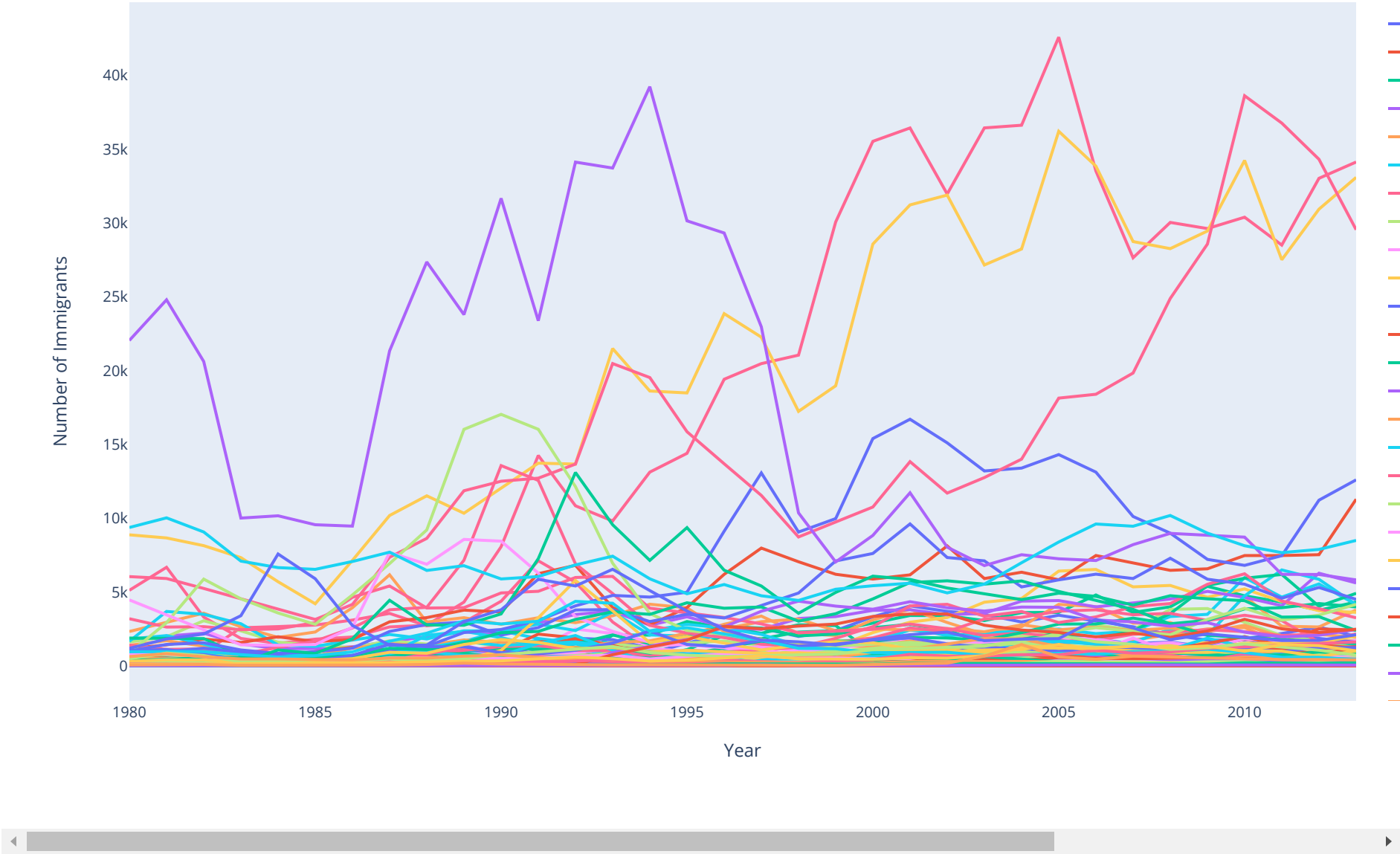
In [68]:

```
#Immigrants from all countires using for loop
traces = [] # Initiate trace
for i in canada1.columns:
    traces.append(
        go.Scatter(
            x=canada1.index.values,
            y=canada1[i],
            mode='lines',
            name = i,
            connectgaps=True,
        )
    )

layout = go.Layout(
    title = 'Immigrants', # Title
    title_font=dict(size=20),
    xaxis = dict(title = 'Year',showgrid=False,showline=False), # x-axis label
    yaxis = dict(title = 'Number of Immigrants',showgrid=False,showline=False), # y-axis label
    font=dict(size=10),
    width=1230,
    height=650
)

fig = go.Figure(data=traces, layout=layout)
fig.show()
```

Immigrants



```
In [71]: from plotly.subplots import make_subplots

#Subplot initialization
fig = make_subplots(
    rows=1,
    cols=2,
    subplot_titles=("Immigration Data", "Insurance Data")
)

# Subplot - 1 (Add graph object trace to a figure)
fig.add_trace(go.Scatter(
    x = canada.index.values,
    y = canada['China'],
    mode = 'lines',
    name = 'China'
),
    row=1, col=1
)

# Add graph object trace to a figure
fig.add_trace(go.Scatter(
    x = canada.index.values,
    y = canada['India'],
    mode = 'lines',
    name = 'India'
),
    row=1, col=1
)

# Add graph object trace to a figure
fig.add_trace(go.Scatter(
    x = canada.index.values,
    y = canada['Pakistan'],
    mode = 'lines',
    name = 'Pakistan'
),
    row=1, col=1
)

# Subplot - 2 (Add graph object trace to a figure)
fig.add_trace(go.Scatter(
    x = insurance[insurance.smoker=='yes'].bmi,
    y = insurance[insurance.smoker=='yes'].charges,
    mode = 'markers',
    name = 'Smoker',
    marker = dict(size = 7, color = '#F39C12',symbol = 'circle',line = dict(width = 1))
),
    row=1, col=2
)

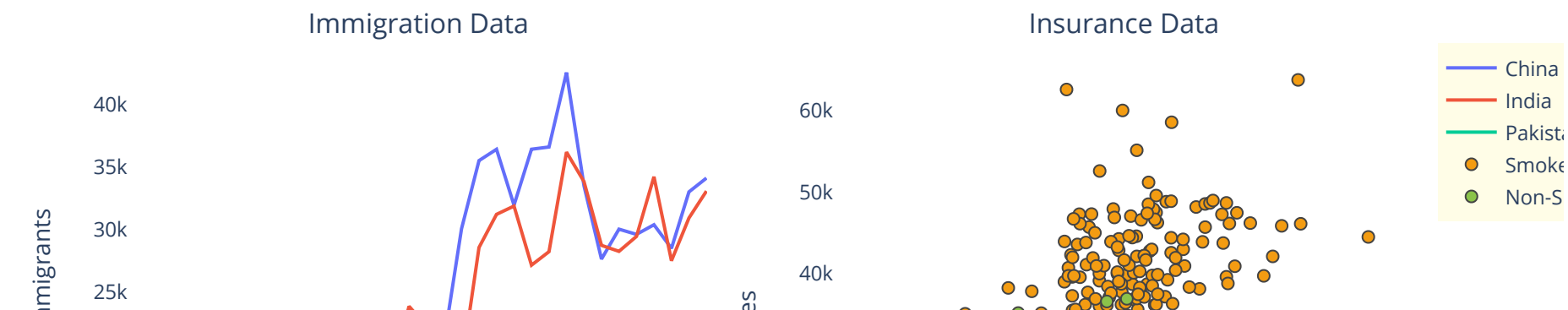
# Add graph object trace to a figure
fig.add_trace(go.Scatter(
    x = insurance[insurance.smoker=='no'].bmi,
    y = insurance[insurance.smoker=='no'].charges,
    mode = 'markers',
    name = 'Non-Smoker',
    marker = dict(size = 7, color = '#8BC34A',symbol = 'circle',line = dict(width = 1))
),
    row=1, col=2
)

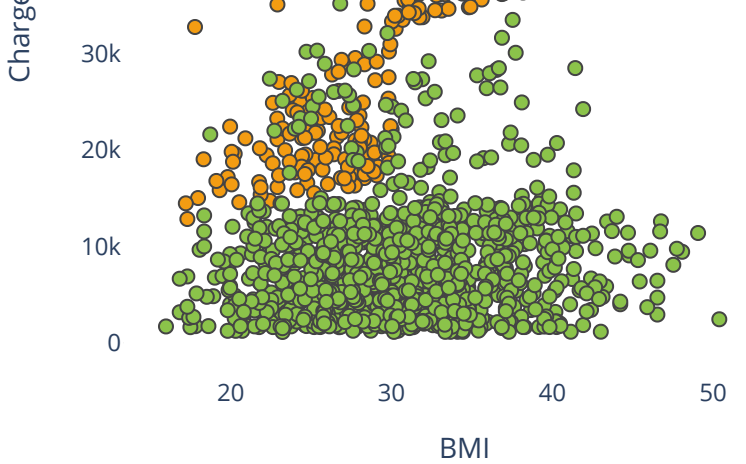
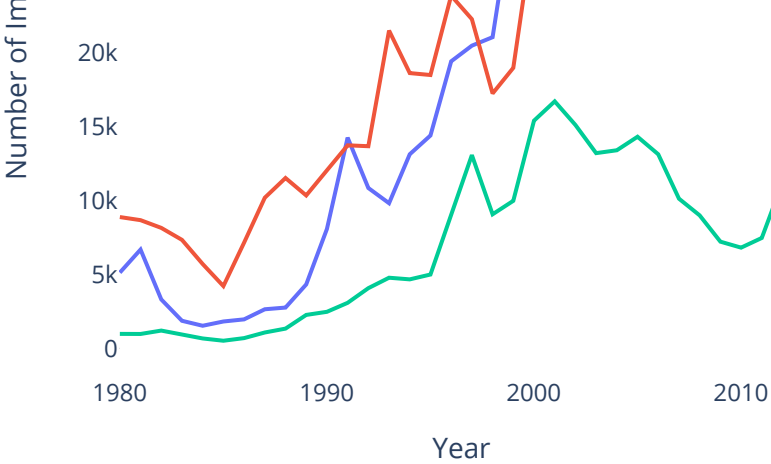
# Changing X & Y Axis properties
fig.update_xaxes(title_text="Year", row=1, col=1,showgrid=False,showline=False)
fig.update_yaxes(title_text="Number of Immigrants", row=1, col=1,showgrid=False,showline=False)
fig.update_xaxes(title_text="BMI" , row=1, col=2,showgrid=False,showline=False)
fig.update_yaxes(title_text="Charges", row=1, col=2,showgrid=False,showline=False)

#Changing plot & figure background
fig.update_layout(
    paper_bgcolor= '#FFFDE7',
    plot_bgcolor= '#FFFDE7',
    title=dict(text = "Sub Plots",x=0.5,y=0.95),
    title_font_size=30
)

fig.show()
```

Sub Plots





Line Plot using Plotly Express

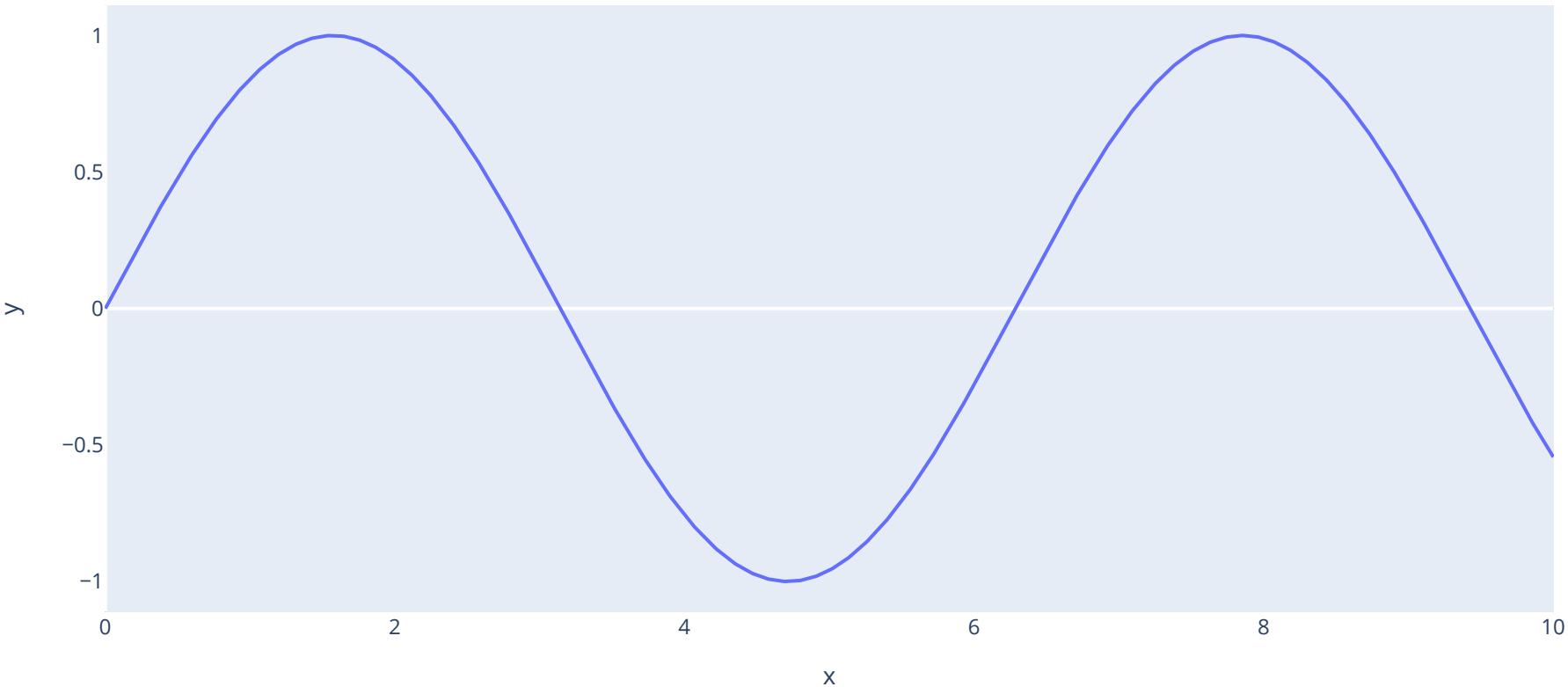
In [72]:

```
col1 = np.linspace(0, 10, 1000)
col2 = np.sin(col1)
fig = px.line(
    x=col1,
    y= col2,
    title="Sine Plot"
)

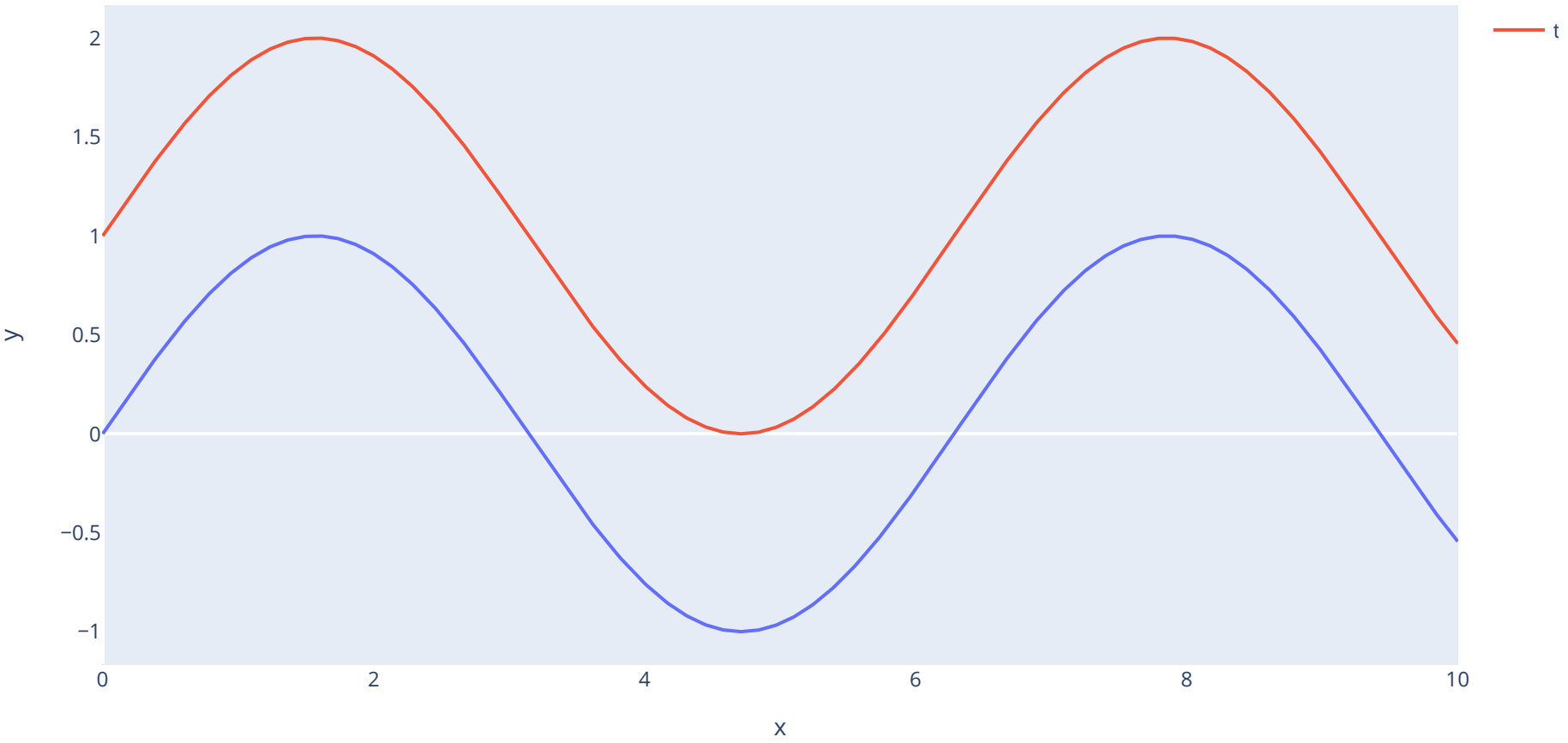
# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

Sine Plot



```
In [73]: fig = px.line(  
        x=col1,  
        y= col2  
        )  
fig.add_scatter(x=col1,  
               y= col2+1  
               )  
  
# Hide grid Lines  
fig.update_xaxes(showgrid=False)  
fig.update_yaxes(showgrid=False)  
  
fig.show()
```



```
In [74]: # Plot Immigrants from India
fig = px.line(
    x=canada1.index.values,
    y= canada1['India']
)

# Plot Immigrants from Pakistan
fig.add_scatter(
    x=canada1.index.values,
    y= canada1['Pakistan'],
    name = 'Pakistan',
    line={'color': 'green'}
)

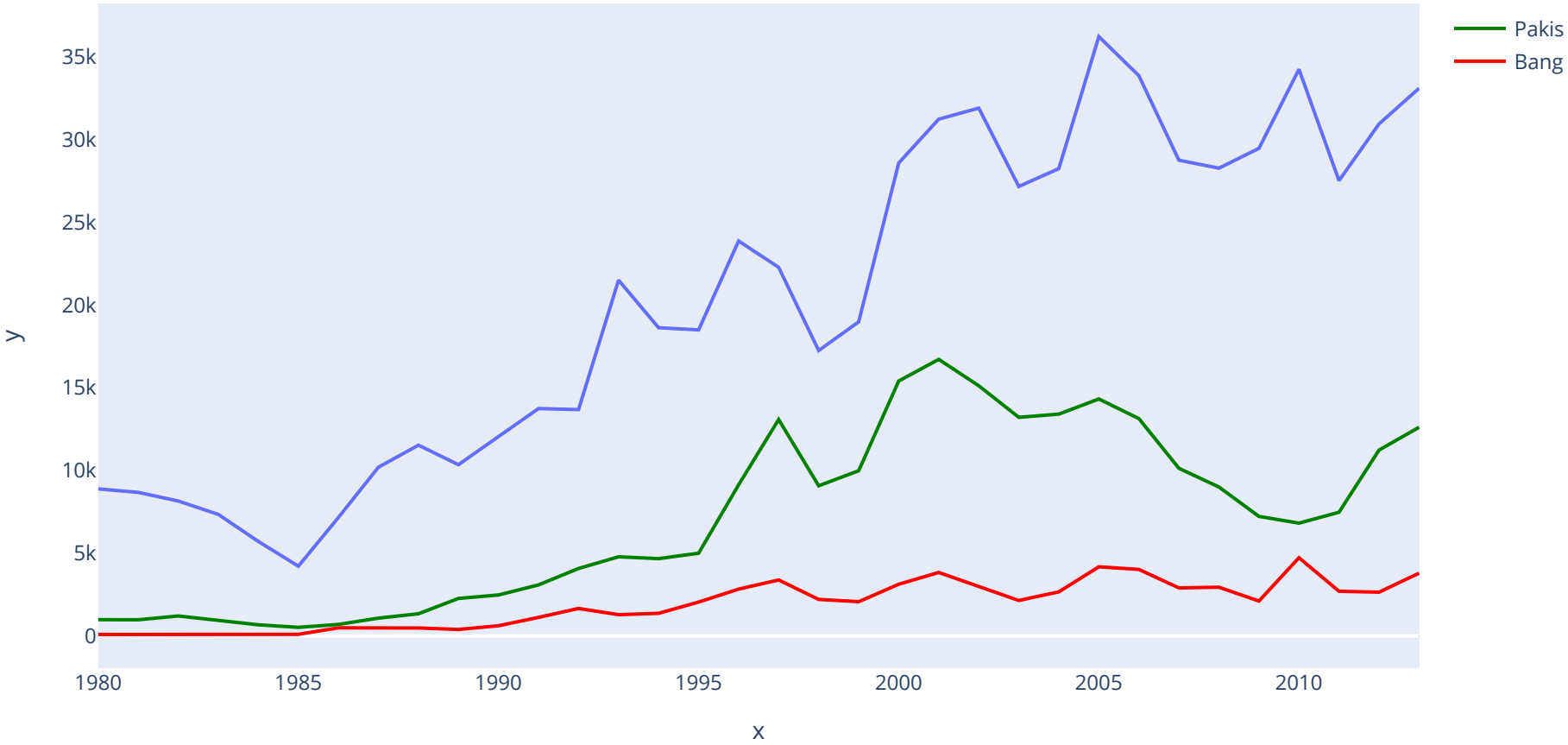
# Plot Immigrants from Bangladesh
fig.add_scatter(
    x=canada1.index.values,
    y= canada1['Bangladesh'] ,
    name = 'Bangladesh',
    line={'color': 'red'}
)

fig.update_layout(title_text='Immigrants')

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

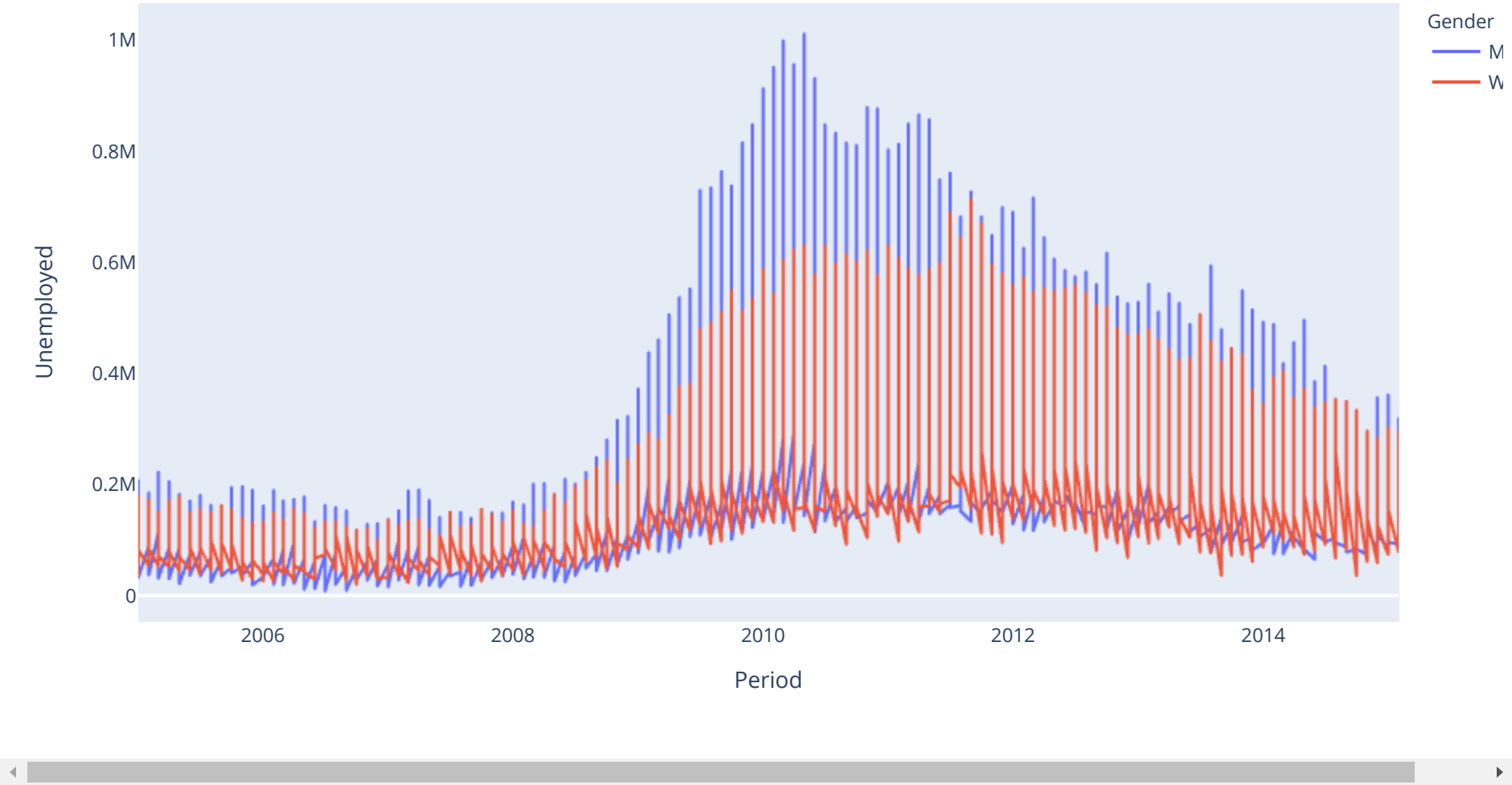
Immigrants



```
In [56]: fig = px.line(
            employment,
            x="Period" ,
            y = "Unemployed",
            color='Gender'
        )

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```



▼ **Bar Plot**

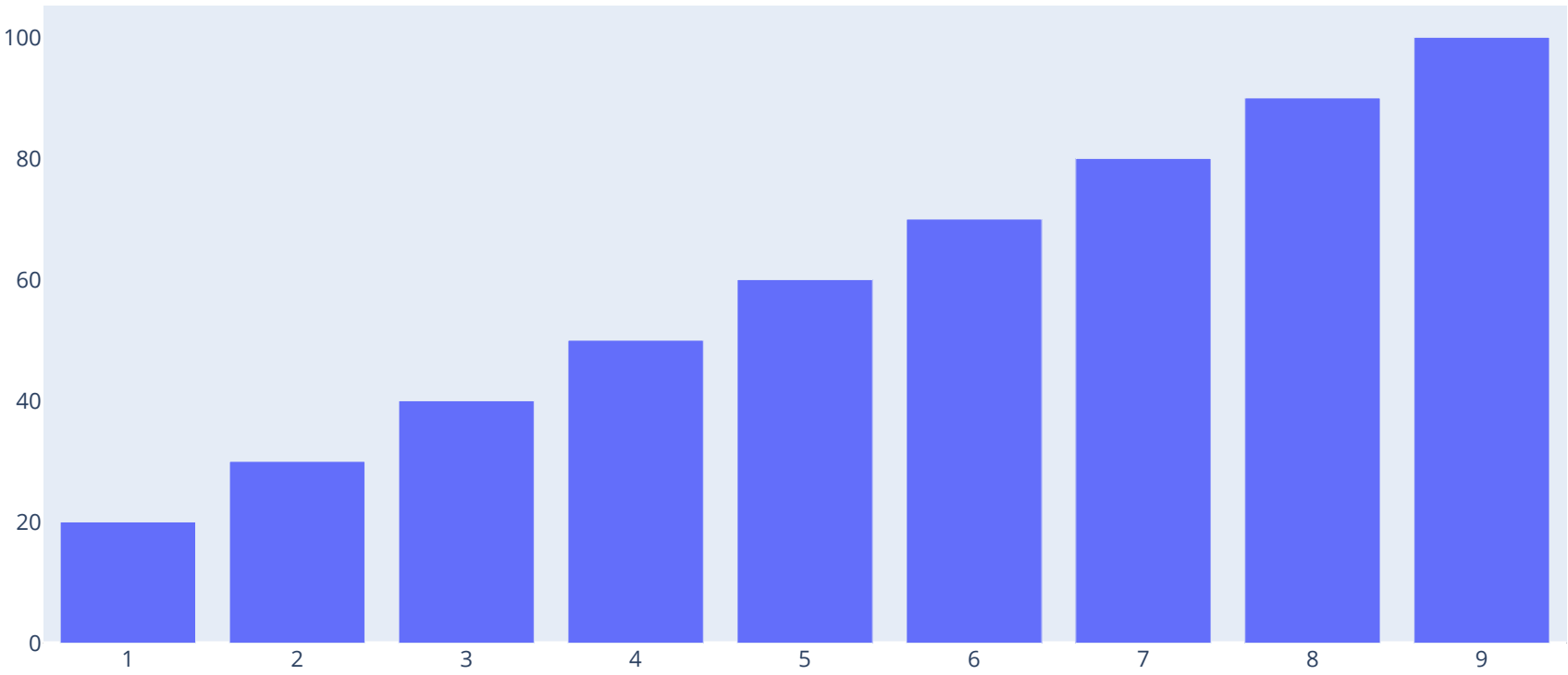

```
In [75]: # Use go.Bar to plot Bar charts in Plotly
x = np.arange(1,10)
y = np.arange(20,110,10)
data = go.Bar(
    x= x,
    y= y,
)

layout = go.Layout(
    title = 'Simple Bar Chart',
    xaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),

    yaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),
)

fig = go.Figure(data=data,layout=layout)
fig.show()
```

Simple Bar Chart



In [76]:

```
# Use go.Bar to plot Bar charts in Plotly
x1 = [1,2,3,3,3,4,5]
y1 = [10,20,30,40,50,60,65]

data = go.Bar(
    x= x1,
    y= y1,
)

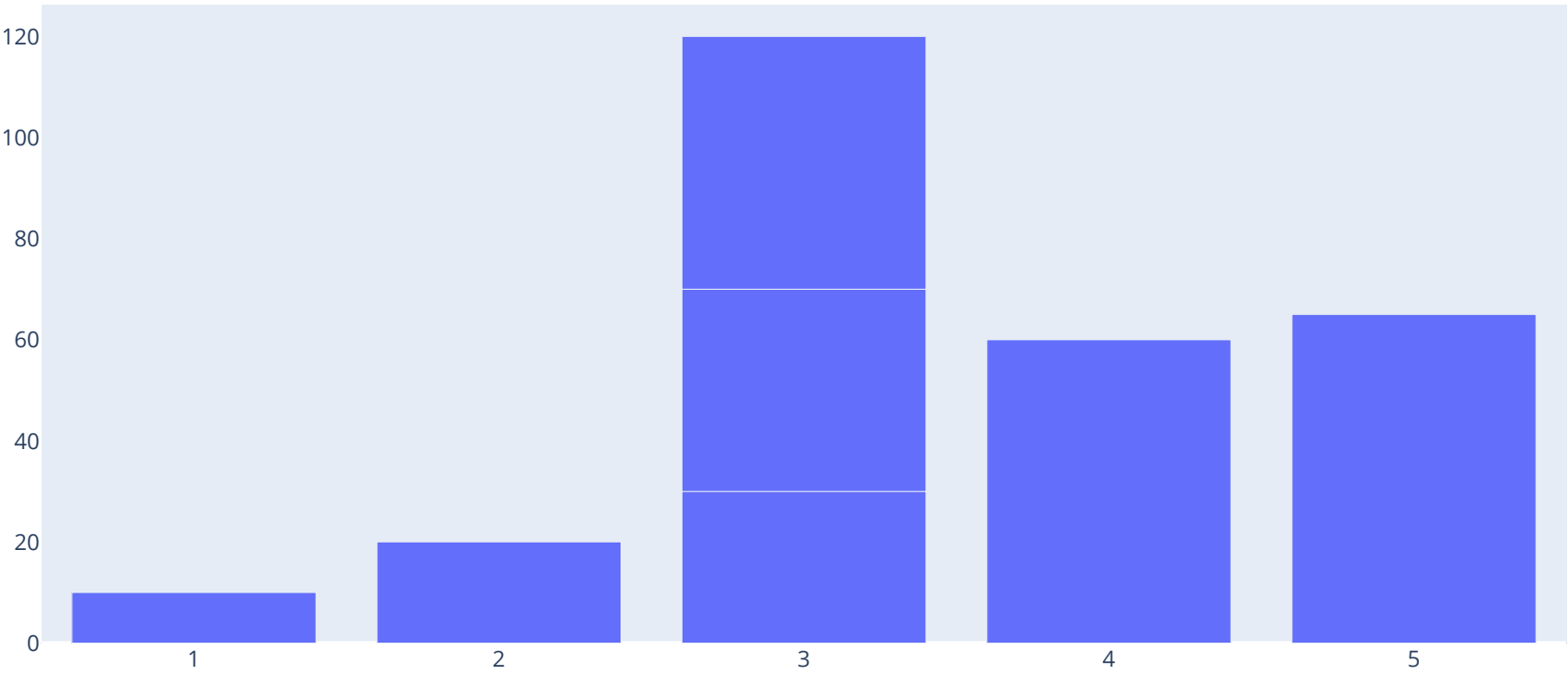
layout = go.Layout(
    title = 'Simple Bar Chart',
    xaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),

    yaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),

)

fig = go.Figure(data=data,layout=layout)
fig.show()
```

Simple Bar Chart



```
In [77]: #Changing color of Bar plot
x = np.arange(1,10)
y = np.arange(20,130,10)
data = go.Bar(
    x= x,
    y= y,
    marker={'color' : '#FFA726'} # changing color of bar plot
)

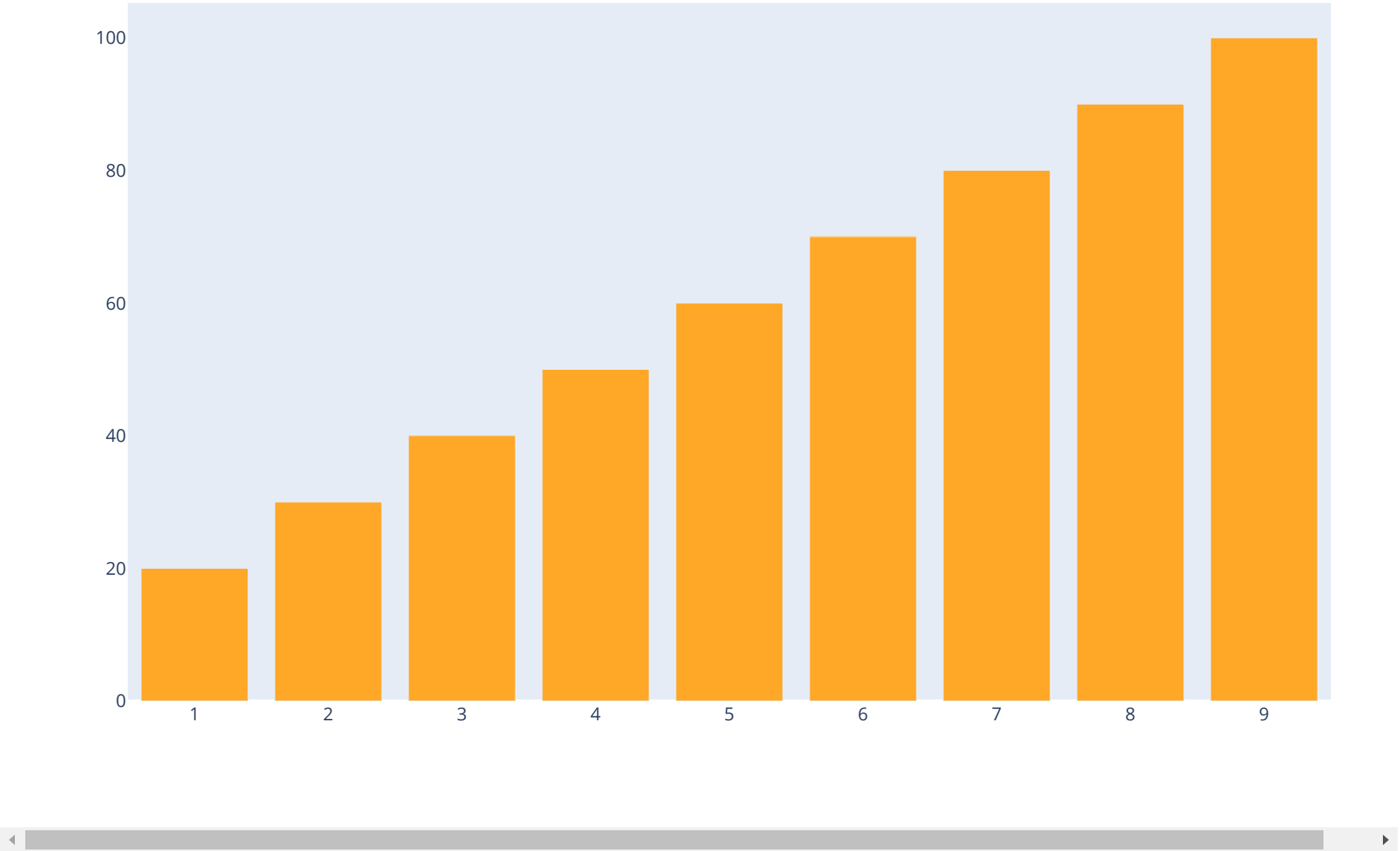
layout = go.Layout(
    title = 'Simple Bar Chart',
    width=970,
    height=650,
    xaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),

    yaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),

)

fig = go.Figure(data=data,layout=layout)
fig.show()
```

Simple Bar Chart



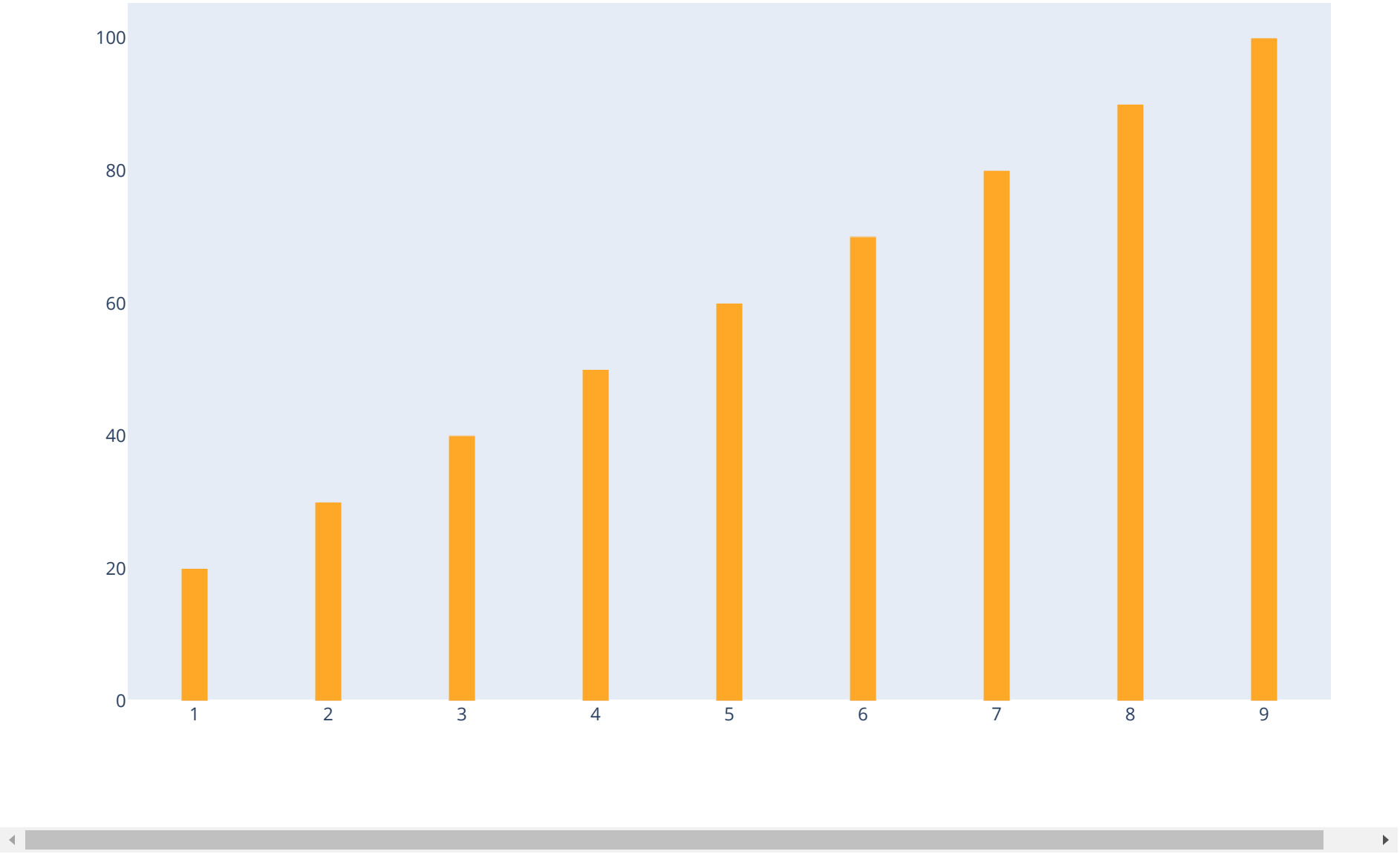
```
In [78]: # Changing width of Bar Plot
x = np.arange(1,10)
y = np.arange(20,130,10)
wid = [0.2,]*9
data = go.Bar(
    x= x,
    y= y,
    marker={'color' : '#FFA726'}, # Changing color of bars
    width=wid # Changing width of Bars
)

layout = go.Layout(
    title = 'Simple Bar Chart',
    width=970,
    height=650,
    xaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),

    yaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),
)

fig = go.Figure(data=data,layout=layout)
fig.show()
```

Simple Bar Chart



In [79]:

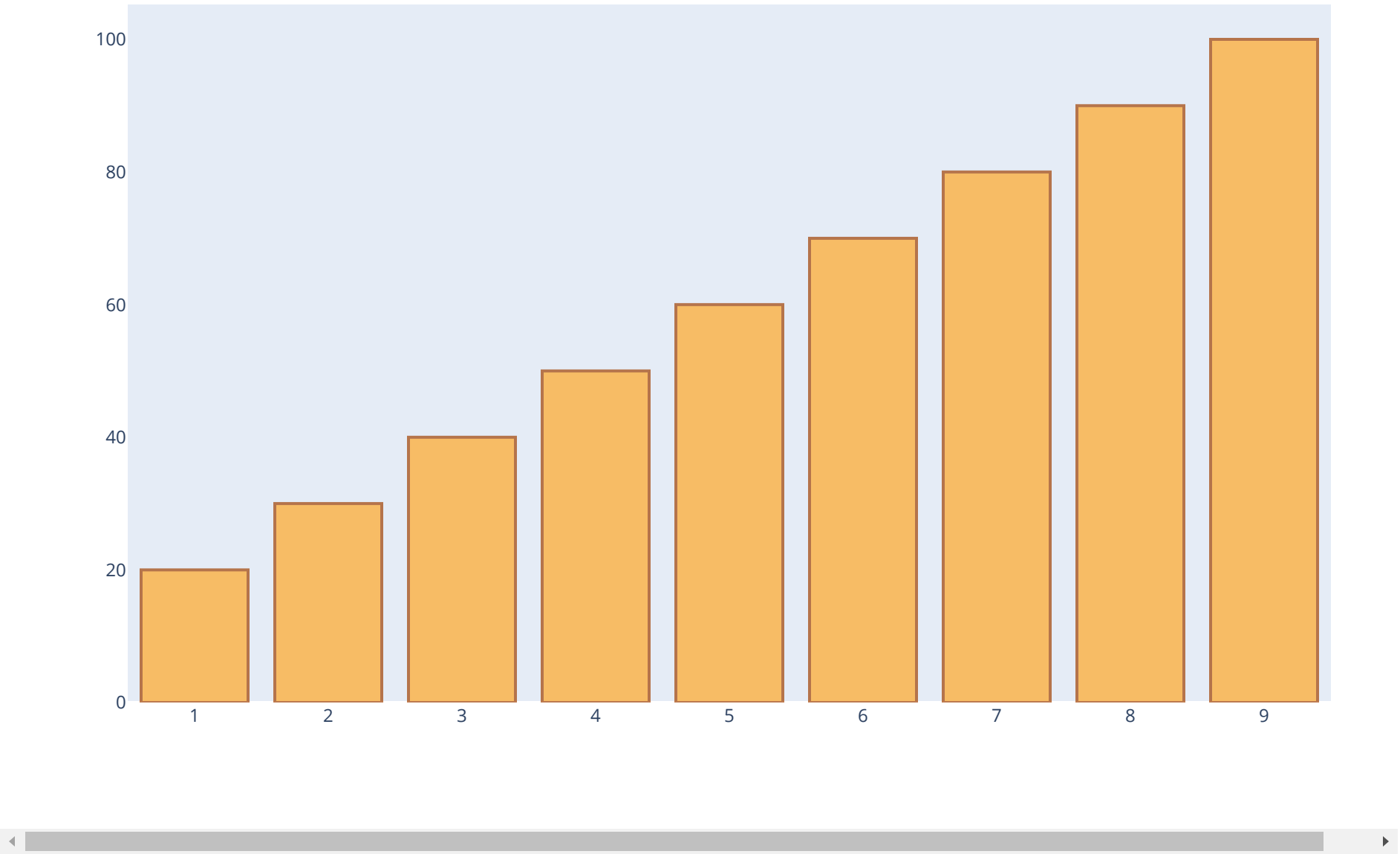
```
x = np.arange(1,10)
y = np.arange(20,130,10)
data = go.Bar(
    x= x,
    y= y,
    marker_color= '#FFA726', # Changing color of Bars
    marker_line_color = '#A04000', # Changing color of border
    marker_line_width = 2, # Changing width of border
    opacity=0.7 # Changing opacity of Bars
)

layout = go.Layout(
    title = 'Simple Bar Chart',
    width=970,
    height=650,
    xaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),

    yaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),
)

fig = go.Figure(data=data,layout=layout)
fig.show()
```

Simple Bar Chart



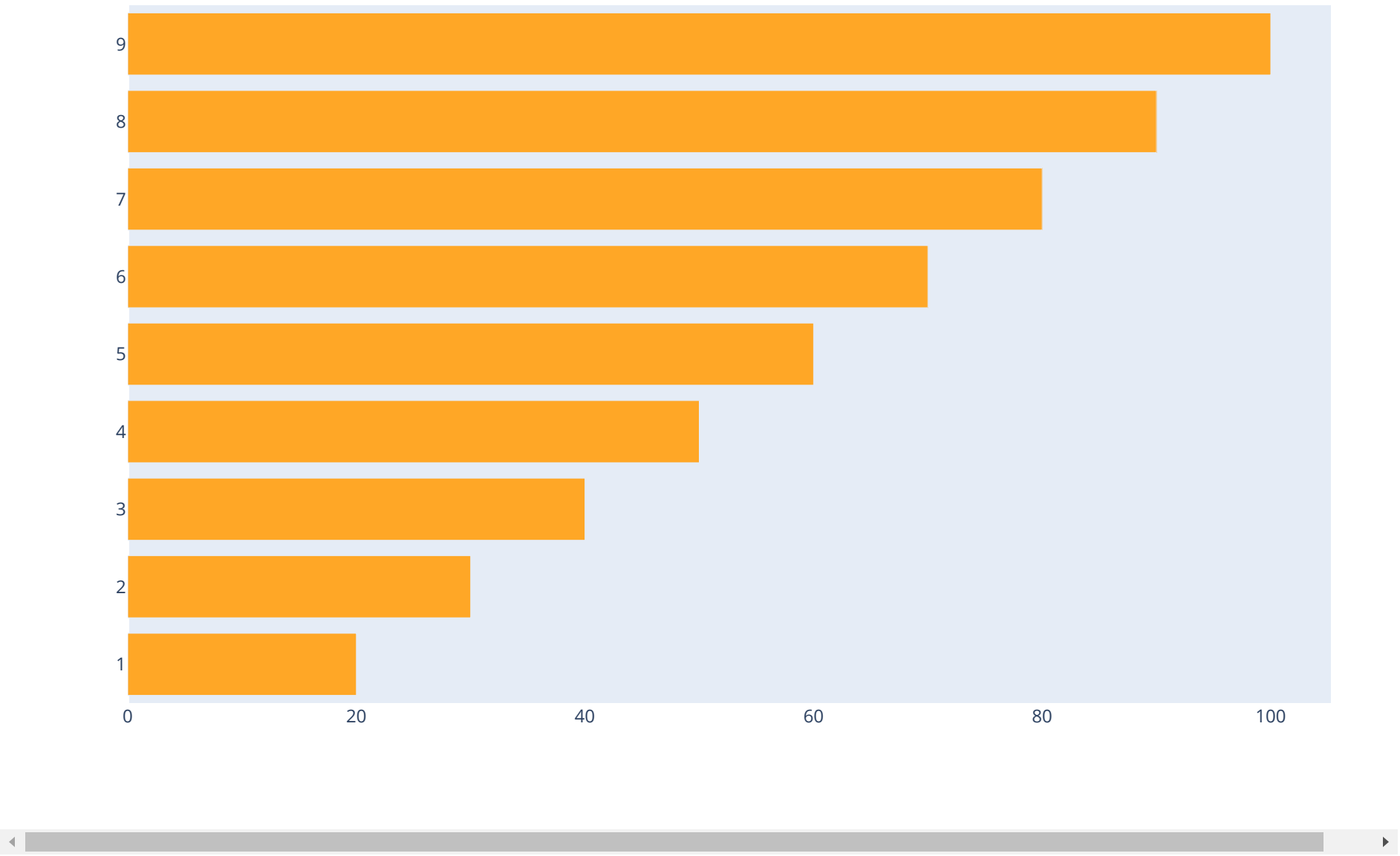
```
In [80]: # Simple Horizontal Bar Plot (Using orientation='h')
x = np.arange(1,10)
y = np.arange(20,130,10)
data = go.Bar(
    x= y,
    y= x,
    marker={'color' : '#FFA726'},
    orientation='h'
)

layout = go.Layout(
    title = 'Simple Bar Chart',
    width=970,
    height=650,
    xaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),

    yaxis=dict(
        showgrid=False, # Hide Gridlines
        showline=False, # Hide X-Axis
    ),
)

fig = go.Figure(data=data,layout=layout)
fig.show()
```

Simple Bar Chart



```
In [81]: Assignee = ['Asif', 'Basit', 'John', 'Charles','Vignesh', 'Arun', 'Ashish', 'Varun']
Tickets_Closed = np.array([52,42,60,35,48,45,28,54])
per = (Tickets_Closed/sum(Tickets_Closed))*100
per = np.round(per, decimals=2)

#Create dataframe
helpdesk = pd.DataFrame({'Assignee' : Assignee, 'Tickets Closed' :Tickets_Closed , 'Percentage': per})
helpdesk = helpdesk.sort_values(by='Percentage')

#Initialize the figure
fig = go.Figure()

#Plot Closure percentage using Horizontal Bar plot
fig.add_trace(go.Bar(
    x=helpdesk.Percentage,
    y=helpdesk.Assignee,
    orientation='h',
    marker=dict(
        color='rgba(70, 171, 100, 0.6)',
        line=dict(color='rgba(70, 171, 100, 1.0)',width=1),
    ),
))

#Update layout
fig.update_layout(
    title=dict(text = "Ticket Closure Summary",x=0.46,y=0.95,font_size=20),
    yaxis=dict(
        showticklabels=True,showgrid=False,showline=False
    ),

    xaxis=dict(
        showticklabels=False,
        domain=[0, 0.6],
        showgrid=False,showline=False
    ),
    margin=dict(l=300, r=20, t=70, b=70),
    paper_bgcolor='rgb(248, 248, 255)',
    plot_bgcolor='rgb(248, 248, 255)',
)

annotations = [] #Initialize anotation object

# Labels
for perc, asg in zip(helpdesk.Percentage, helpdesk.Assignee):

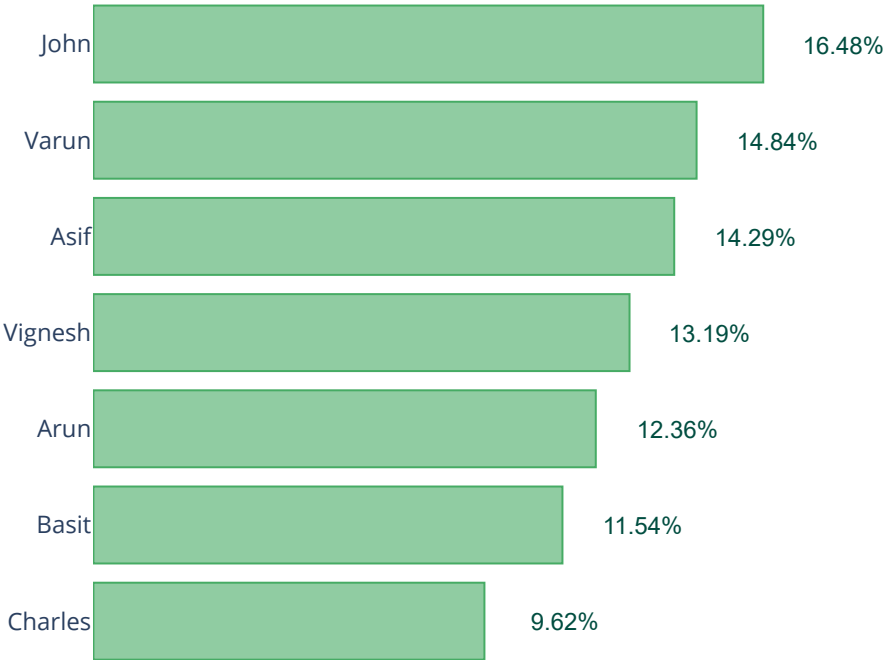
    # Displaying Label bar percentage
    annotations.append(dict(xref='x',
        yref='y',
        y=asg,
        x=perc + 2,
        text=str(perc) + '%',
        font=dict(family='Arial', size=12,color='#004D40'),
        showarrow=False))

    # Displaying Footer
    annotations.append(dict(xref='paper',
        yref='paper',
        x=1,
        y=-0.17,
        text='Help Desk ' +'Closure Statistics, ' +'Year 2020',
        font=dict(family='Arial', size=11, color='#9E9E9E'),
        showarrow=False
    ))

fig.update_layout(annotations=annotations)

fig.show()
```

Ticket Closure Summary



```
In [82]: x1= [1,3,5,7]
x2=[2,4,6,8]
y1 = [7,7,7,7]
y2= [17,18,29,40]

trace0 = go.Bar(
    x= x1,
    y= y1,
    marker= dict (color ='#FFA726' )

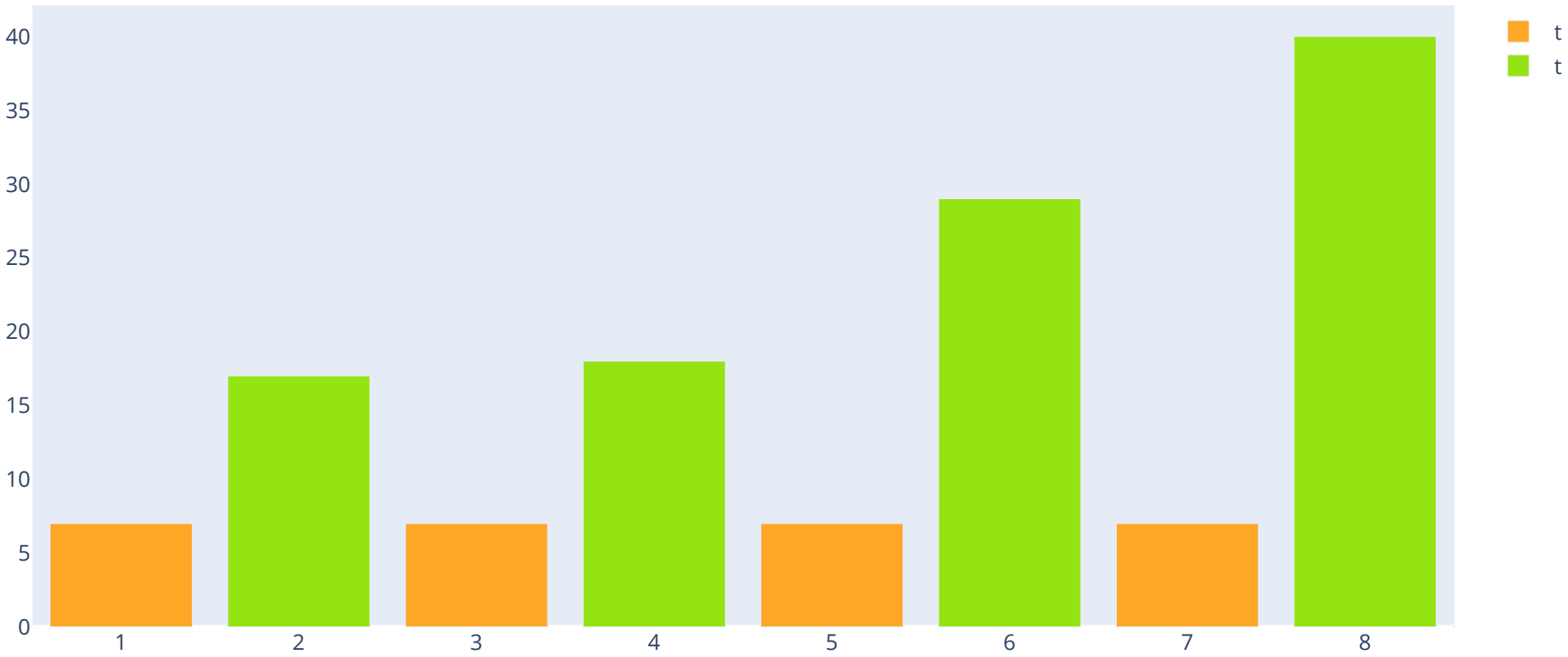
)

trace1 = go.Bar(
    x= x2,
    y= y2,
    marker={'color' : '#94E413'}
)

data = [trace0,trace1]
fig = go.Figure(data=data)

# Hide grid lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```



▼

Stacked Vertical Bar

In [83]:

```
x = ['Asif','Basit','John','Batista', 'Gabriel' , 'Paul' , 'Ravi']
y1 = [17,18,29,33,38,39,42]
y2 = [20,21,22,23,21,28,25]
y3 = [5,13,11,12,13,11,16]
trace0 = go.Bar(
    x= x,
    y= y1,
    marker= dict (color ='#FF6F00' ),
    name = 'Open Tickets'

)

trace1 = go.Bar(
    x= x,
    y= y2,
    marker={'color' : '#FFB300'},
    name = 'Closed Tickets'
)

trace2 = go.Bar(
    x= x,
    y= y3,
    marker={'color' : '#F7DC6F'},
    name = 'Cancelled Tickets'
)

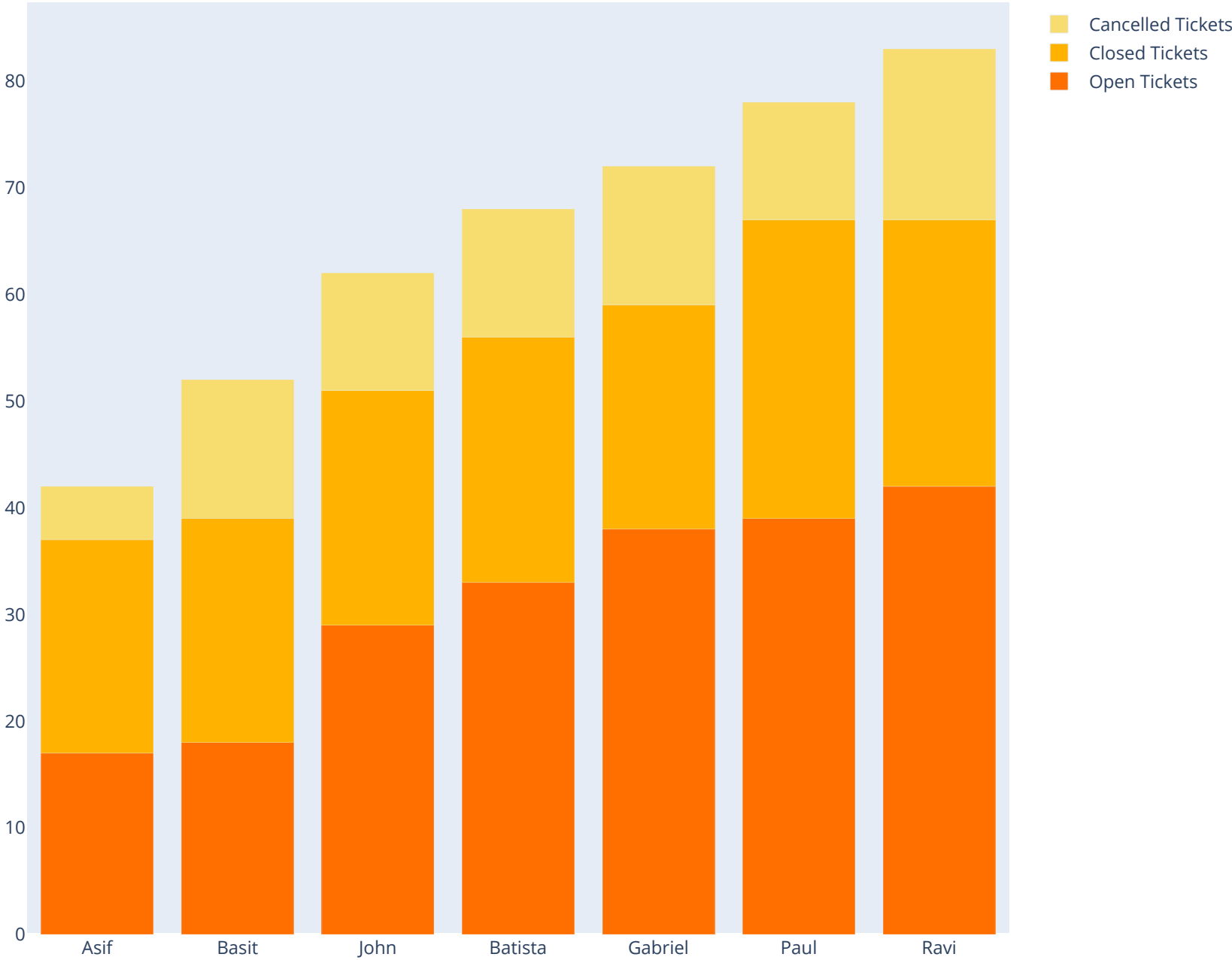
layout = go.Layout(
    title= 'Open Tickets by Status' ,
    barmode = 'stack',
    width=900,
    height=800
)

data = [trace0,trace1,trace2]
fig = go.Figure(data=data, layout=layout)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

Open Tickets by Status



In [84]:

```
#Displaying values in bar plot using "text" and "textposition" parameter
x = ['Asif','Basit','John','Batista', 'Gabriel' , 'Paul' , 'Ravi']
y1 = [17,18,29,33,38,39,42]
y2 = [20,21,22,23,21,28,25]
y3 = [5,13,11,12,13,11,16]
trace0 = go.Bar(
    x= x,
    y= y1,
    marker= dict (color ='#FF6F00' ),
    name = 'Open Tickets',
    text=y1,
    textposition='auto'
)

trace1 = go.Bar(
    x= x,
    y= y2,
    marker={'color' : '#FFB300'},
    name = 'Closed Tickets',
    text=y2,
    textposition='auto'
)

trace2 = go.Bar(
    x= x,
    y= y3,
    marker={'color' : '#F7DC6F'},
    name = 'Cancelled Tickets',
    text=y3,
    textposition='auto'
)

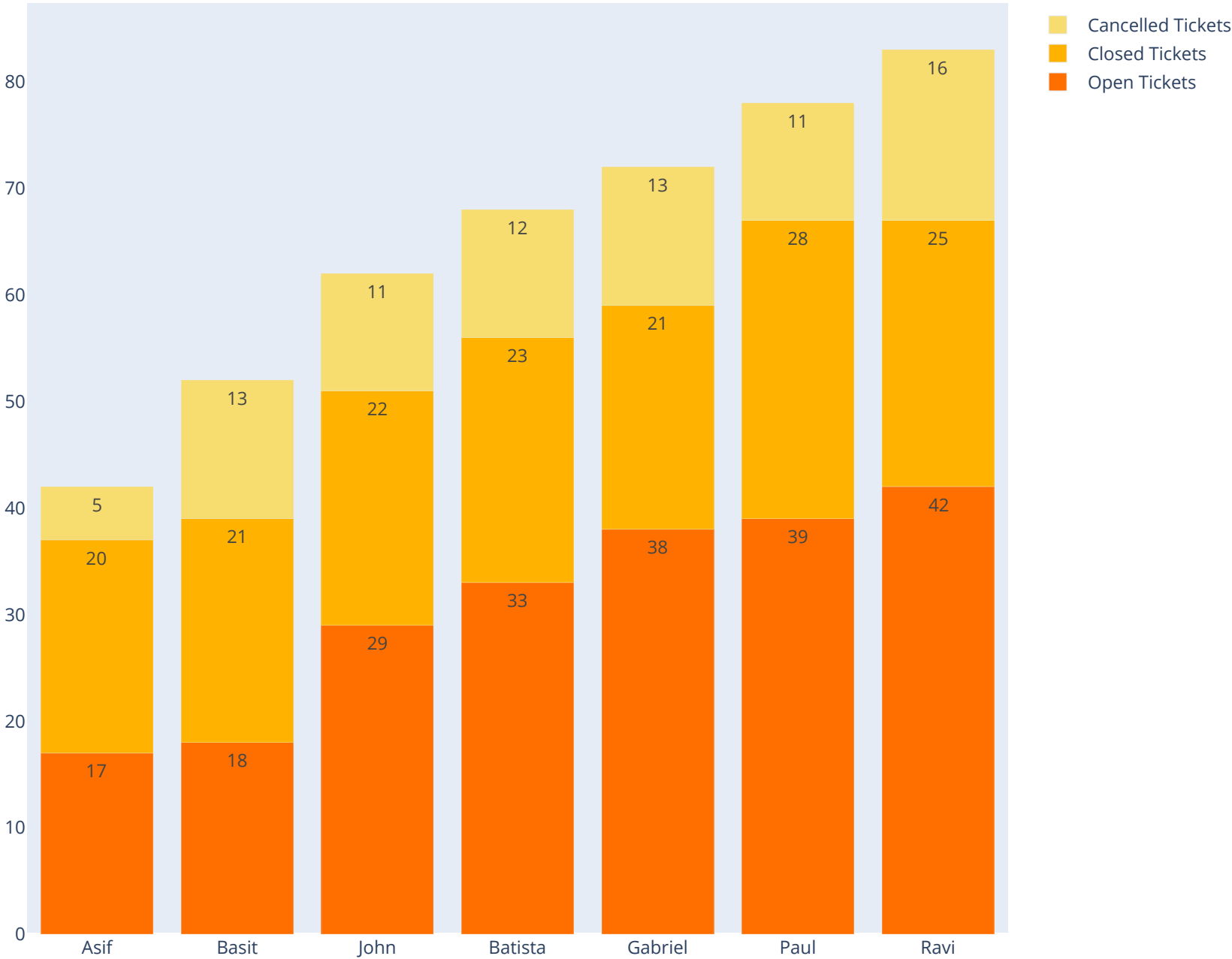
layout = go.Layout(
    title= 'Open Tickets by Status' ,
    barmode = 'stack',
    width=900,
    height=800
)

data = [trace0,trace1,trace2]
fig = go.Figure(data=data, layout=layout)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

Open Tickets by Status



Stacked Horizontal Bar

```
In [85]: x = ['Asif','Basit','John','Batista', 'Gabriel' , 'Paul' , 'Ravi']
y1 = [17,18,29,33,38,39,42]
y2 = [20,21,22,23,21,28,25]
y3 = [5,13,11,12,13,11,16]

trace0 = go.Bar(
    x= y1,
    y= x,
    marker= dict (color ='#FF6F00'),
    name = 'Open Tickets',
    orientation='h',
    text=y1,
    textposition='auto'
)

trace1 = go.Bar(
    x= y2,
    y= x,
    marker={'color' : '#FFB300'},
    name = 'Closed Tickets',
    orientation='h',
    text=y2,
    textposition='auto'
)

trace2 = go.Bar(
    x= y3,
    y= x,
    marker={'color' : '#F7DC6F'},
    name = 'Cancelled Tickets',
    orientation='h',
    text=y3,
    textposition='auto'
)

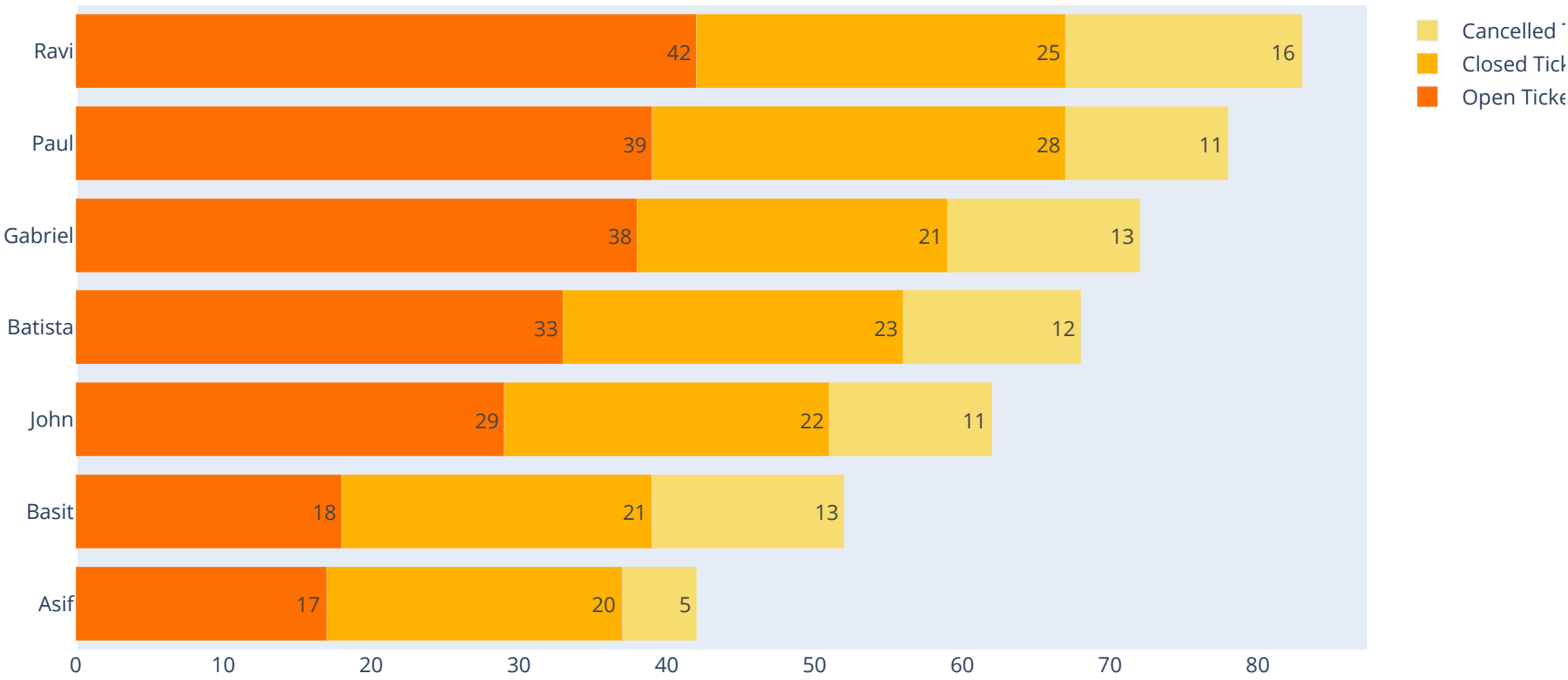
layout = go.Layout(
    title= 'Open Tickets by Status' ,
    barmode = 'stack',
    width=990,
    height=550
)

data = [trace0,trace1,trace2]
fig = go.Figure(data=data, layout=layout)

# Hide grid lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

Open Tickets by Status



```
In [86]: x = ['Asif','Basit','John','Batista', 'Gabriel' , 'Paul' , 'Ravi']
y1 = [17,18,29,33,38,39,42]
y2 = [20,21,22,23,21,28,25]
y3 = [5,13,11,12,13,11,16]

trace0 = go.Bar(
    x= y1,
    y= x,
    marker= dict (color = '#FF9800',line=dict(color='#F4511E',width=2)),
    name = 'Open Tickets',
    orientation='h',
    text=y1,
    textposition='auto',
    opacity=0.8,
)

trace1 = go.Bar(
    x= y2,
    y= x,
    marker= dict (color = '#7CB342',line=dict(color='#2E7D32', width=2)),
    name = 'Closed Tickets',
    orientation='h',
    text=y2,
    textposition='auto',
    opacity=0.8,
)

trace2 = go.Bar(
    x= y3,
    y= x,
    marker= dict (color = '#1E88E5',line=dict(color='#3F51B5', width=2)),
    name = 'Cancelled Tickets',
    orientation='h',
    text=y3,
    textposition='auto',
    opacity=0.7,
)

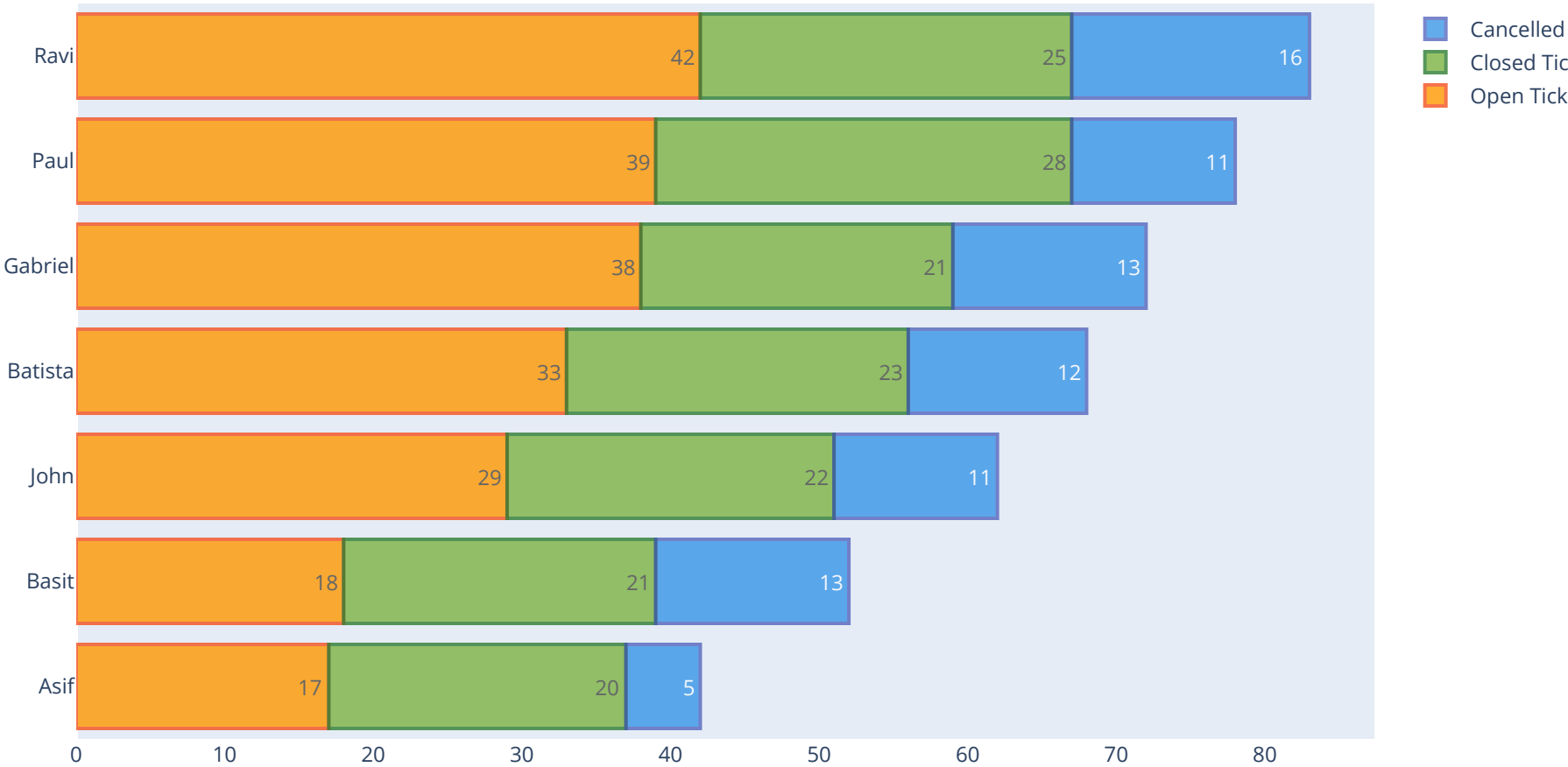
layout = go.Layout(
    title= 'Open Tickets by Status' ,
    barmode = 'stack',
    width=990,
    height=600
)

data = [trace0,trace1,trace2]
fig = go.Figure(data=data, layout=layout)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

Open Tickets by Status



Grouped Bar Chart

In [87]:

```
x = ['Asif','Basit','John','Batista', 'Gabriel' , 'Paul' , 'Ravi']
y1 = [17,18,29,33,38,39,42]
y2 = [20,21,22,23,21,28,25]
y3 = [5,13,11,12,13,11,16]
trace0 = go.Bar(
    x= x,
    y= y1,
    marker= dict (color = '#FF6F00' ),
    name = 'Open Tickets',
)

trace1 = go.Bar(
    x= x,
    y= y2,
    marker={'color' : '#FFB300'},
    name = 'Closed Tickets'
)

trace2 = go.Bar(
    x= x,
    y= y3,
    marker={'color' : '#F7DC6F'},
    name = 'Cancelled Tickets'
)

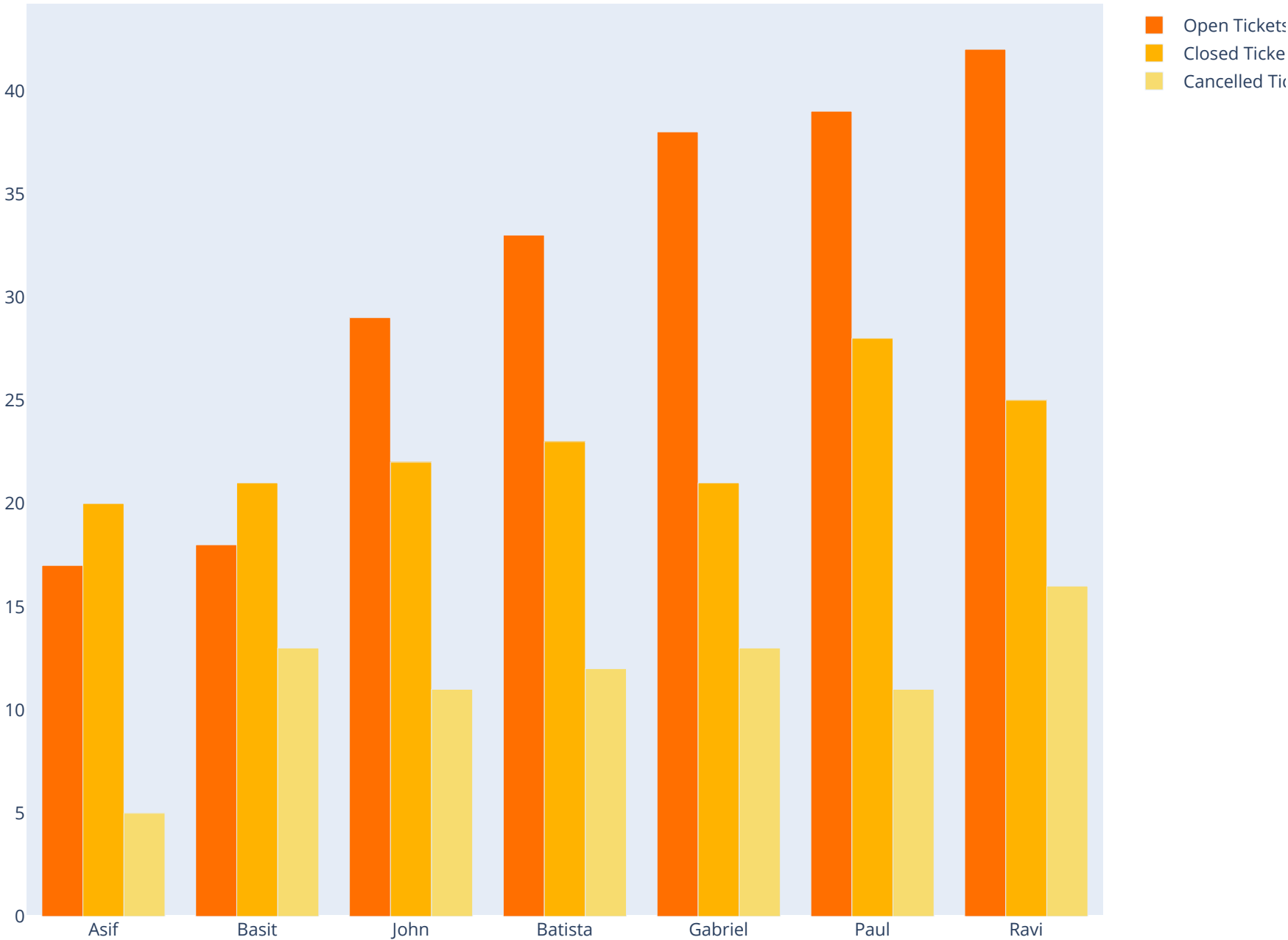
layout = go.Layout(
    title= 'Open Tickets by Status' ,
    width=980,
    height=800
)

data = [trace0,trace1,trace2]
fig = go.Figure(data=data, layout=layout)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

Open Tickets by Status



In [88]:

```
# Grouped Bar Chart with values displayed outside the bar (Using textposition='outside')
x = ['Asif','Basit','John','Batista', 'Gabriel' , 'Paul' , 'Ravi']
y1 = [17,18,29,33,38,39,42]
y2 = [20,21,22,23,21,28,25]
y3 = [5,13,11,12,13,11,16]
trace0 = go.Bar(
    x= x,
    y= y1,
    marker= dict (color ='#FF6F00' ),
    name = 'Open Tickets',
    text=y1,
    textposition='outside'
)

trace1 = go.Bar(
    x= x,
    y= y2,
    marker={'color' : '#FFB300'},
    name = 'Closed Tickets',
    text=y2,
    textposition='outside'
)

trace2 = go.Bar(
    x= x,
    y= y3,
    marker={'color' : '#F7DC6F'},
    name = 'Cancelled Tickets',
    text=y3,
    textposition='outside'
)

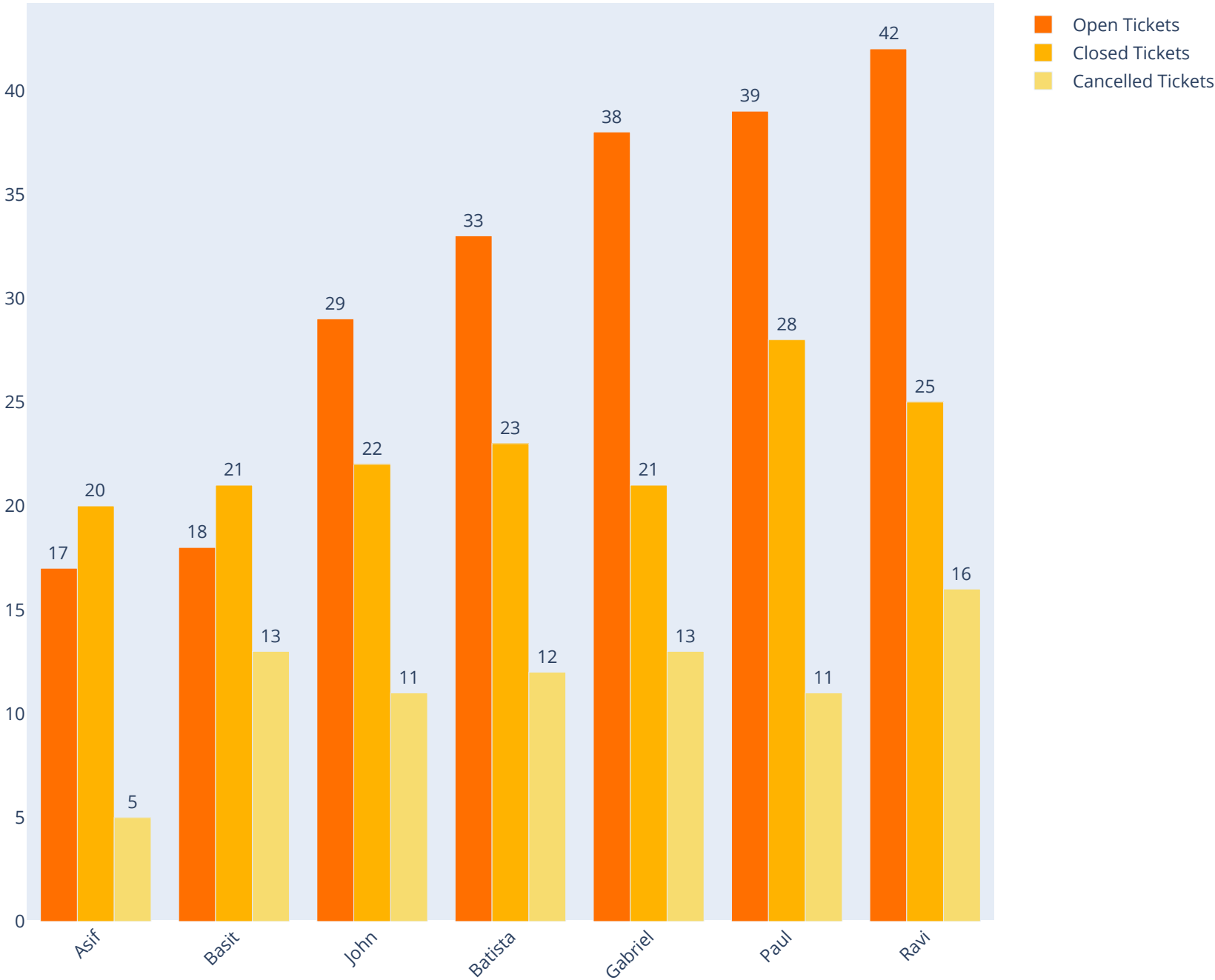
layout = go.Layout(
    title= 'Open Tickets by Status' ,
    barmode = 'group',
    width=900,
    height=800,
    xaxis_tickangle=-45
)

data = [trace0,trace1,trace2]
fig = go.Figure(data=data, layout=layout)

# Hide grid lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

Open Tickets by Status




```
In [89]: # Grouped Bar Chart with values displayed inside the bar using "auto" textposition
x = ['Asif','Basit','John','Batista', 'Gabriel' , 'Paul' , 'Ravi']
y1 = [17,18,29,33,38,39,42]
y2 = [20,21,22,23,21,28,25]
y3 = [5,13,11,12,13,11,16]
trace0 = go.Bar(
    x= x,
    y= y1,
    marker= dict (color ='#FF6F00' ),
    name = 'Open Tickets',
    text=y1,
    textposition='auto'
)

trace1 = go.Bar(
    x= x,
    y= y2,
    marker={'color' : '#FFB300'},
    name = 'Closed Tickets',
    text=y2,
    textposition='auto'
)

trace2 = go.Bar(
    x= x,
    y= y3,
    marker={'color' : '#F7DC6F'},
    name = 'Cancelled Tickets',
    text=y3,
    textposition='auto'
)

layout = go.Layout(
    title=dict(text = "Tickets by Status",x=0.5,y=0.95,font_size=25),
    barmode = 'group',
    width=980,
    height=800,
    xaxis_tickangle=-45,
    xaxis_tickfont_size=14,
    yaxis=dict(
        title='Number of Tickets',
        titlefont_size=16,
        tickfont_size=14,
    ),

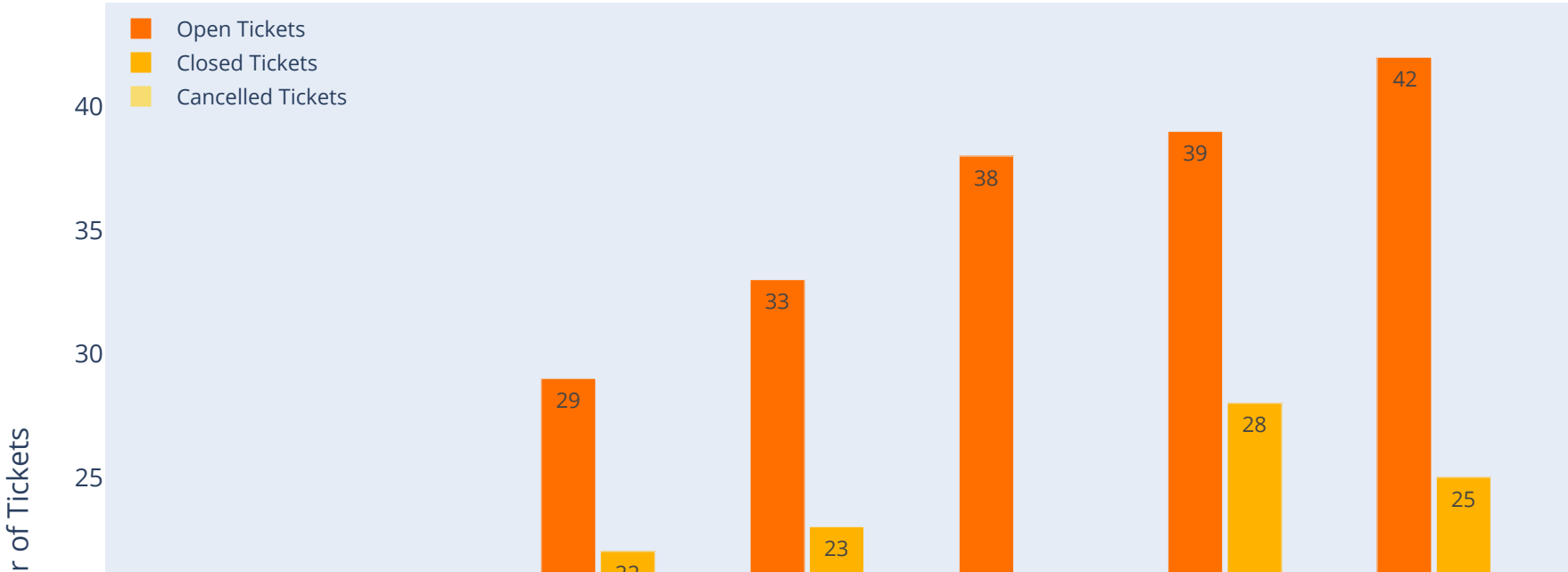
    xaxis=dict(
        title='Assignee',
        titlefont_size=16,
        tickfont_size=14,
    ),
    legend=dict(
        x=0,
        y=1,
        bgcolor='rgba(255, 255, 255, 0)',
        bordercolor='rgba(255, 255, 255, 0)'
    ),
    bargap=0.15, # gap between bars of adjacent location coordinates.
    bargroupgap=0.08 # gap between bars of the same location coordinate.
)

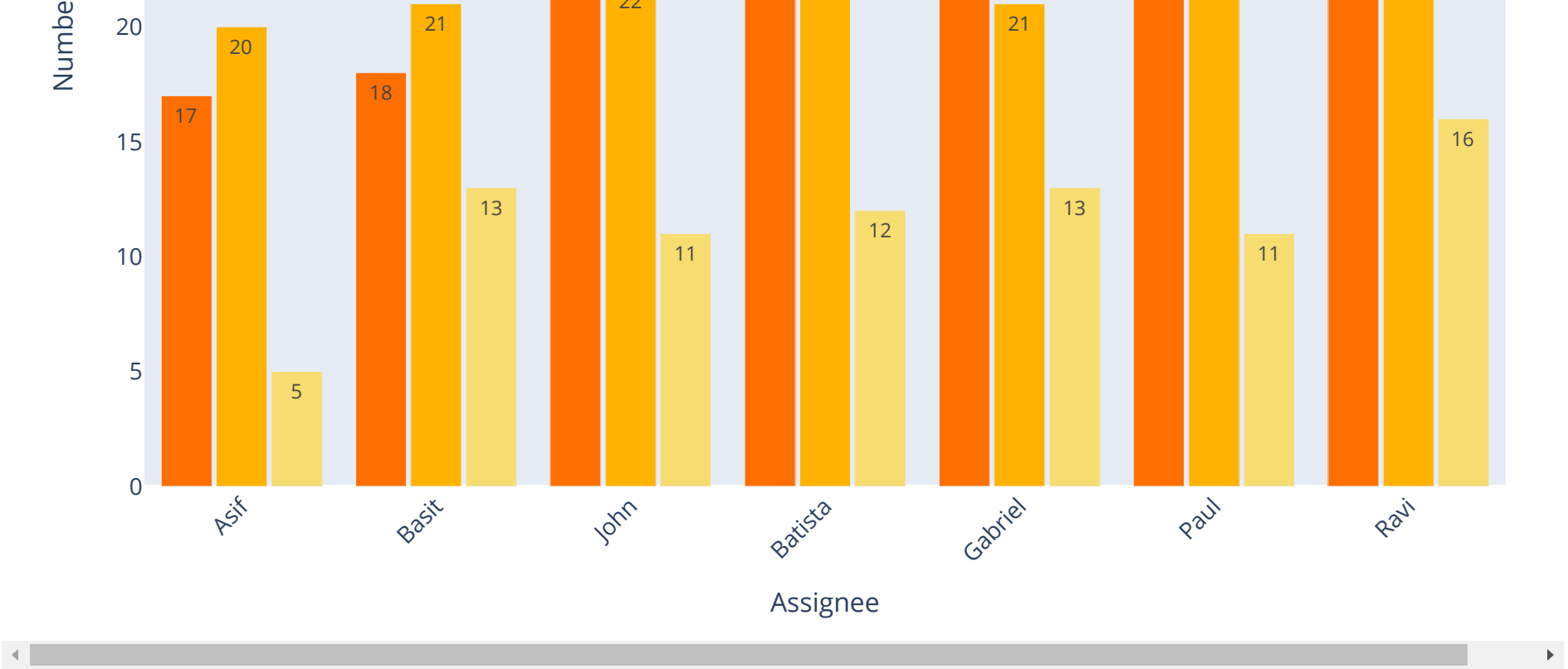
data = [trace0,trace1,trace2]
fig = go.Figure(data=data, layout=layout)

# Hide grid lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

Tickets by Status





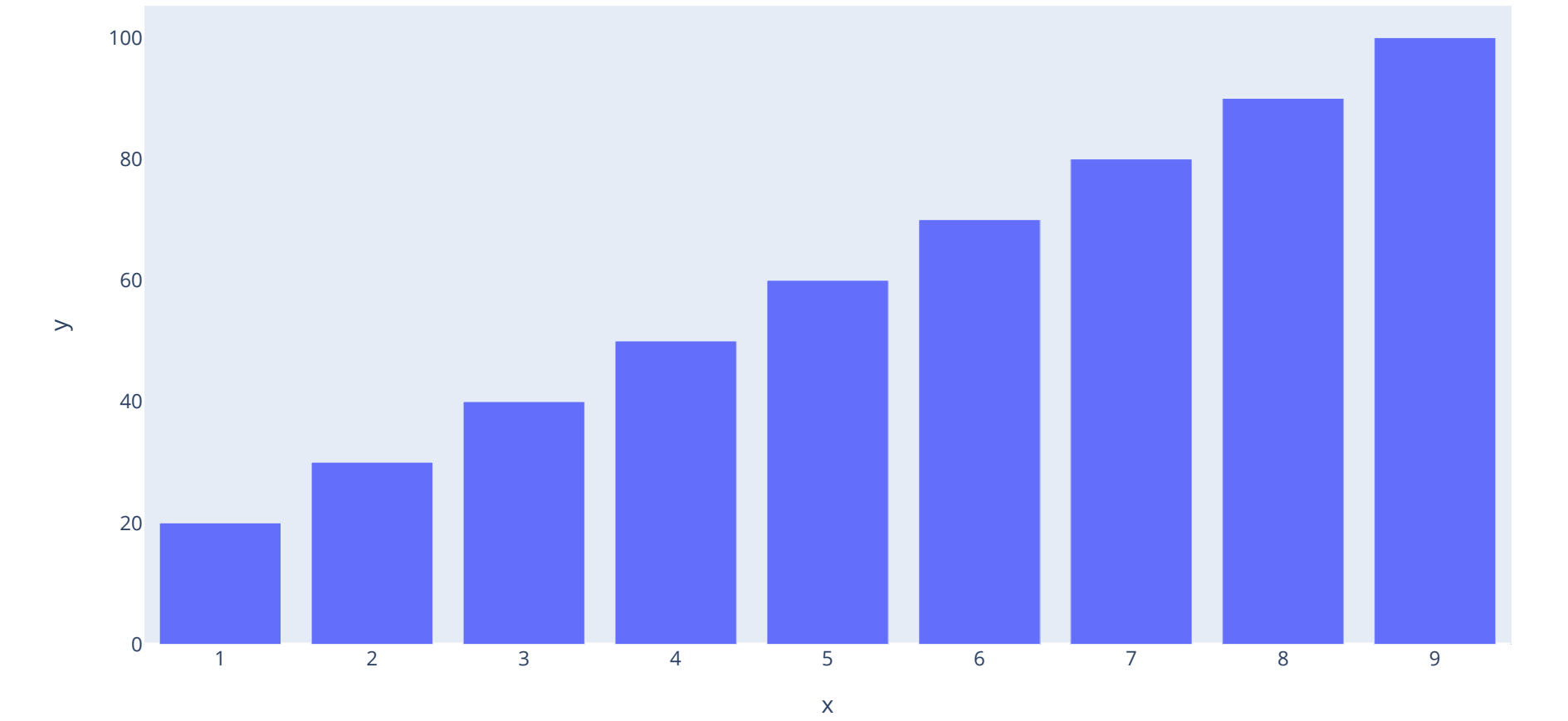
▼ **Bar Plot using Plotly Express**

```
In [90]: #Simple Bar plot using px.bar

x = np.arange(1,10)
y = np.arange(20,110,10)
fig = px.bar(x=x, y=y)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

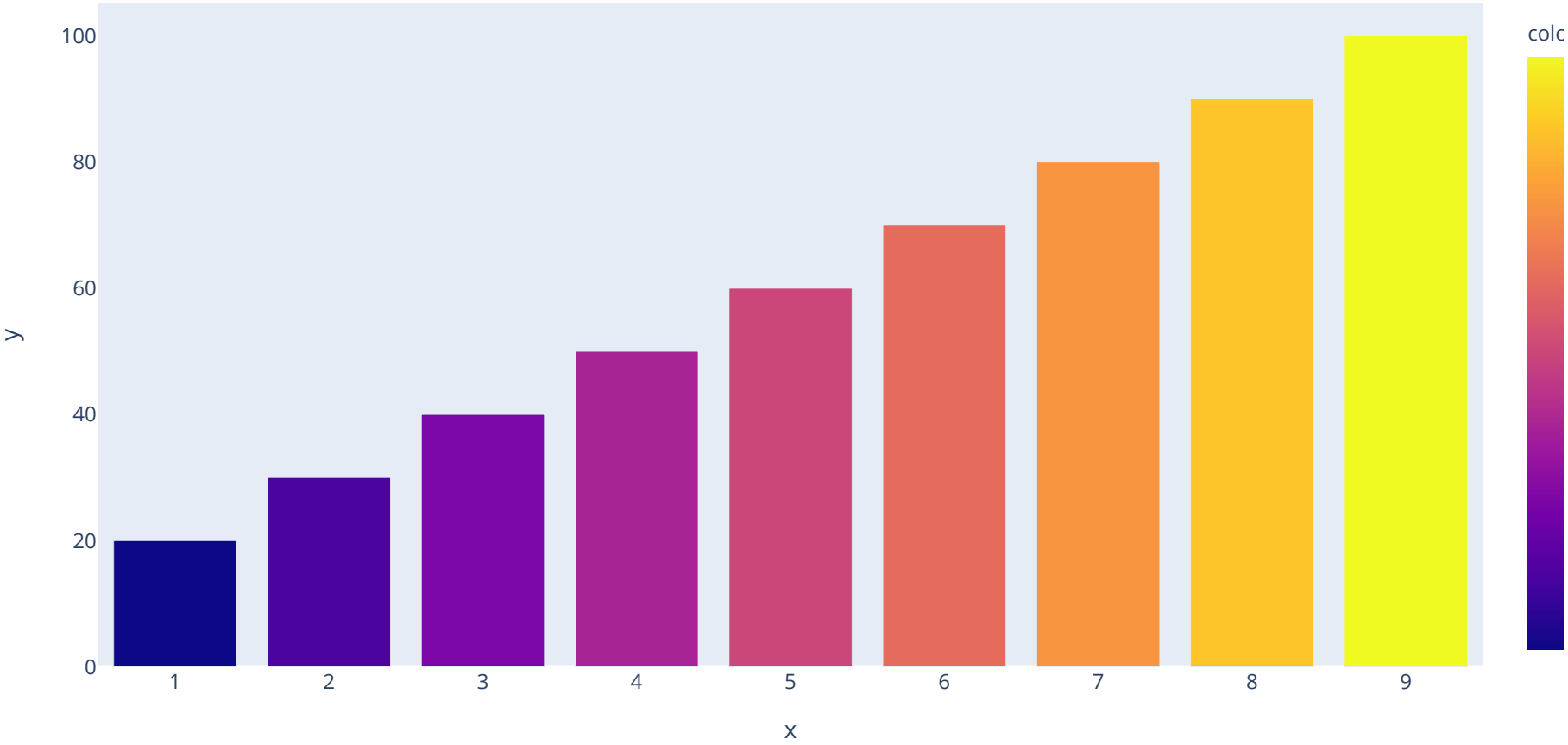


```
In [91]: x = np.arange(1,10)
y = np.arange(20,110,10)
fig = px.bar(x=x, y=y,color=y)
fig.layout.title.text = "Bar Plot - Plotly Express"
fig.update_traces(textposition='outside')

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

Bar Plot - Plotly Express

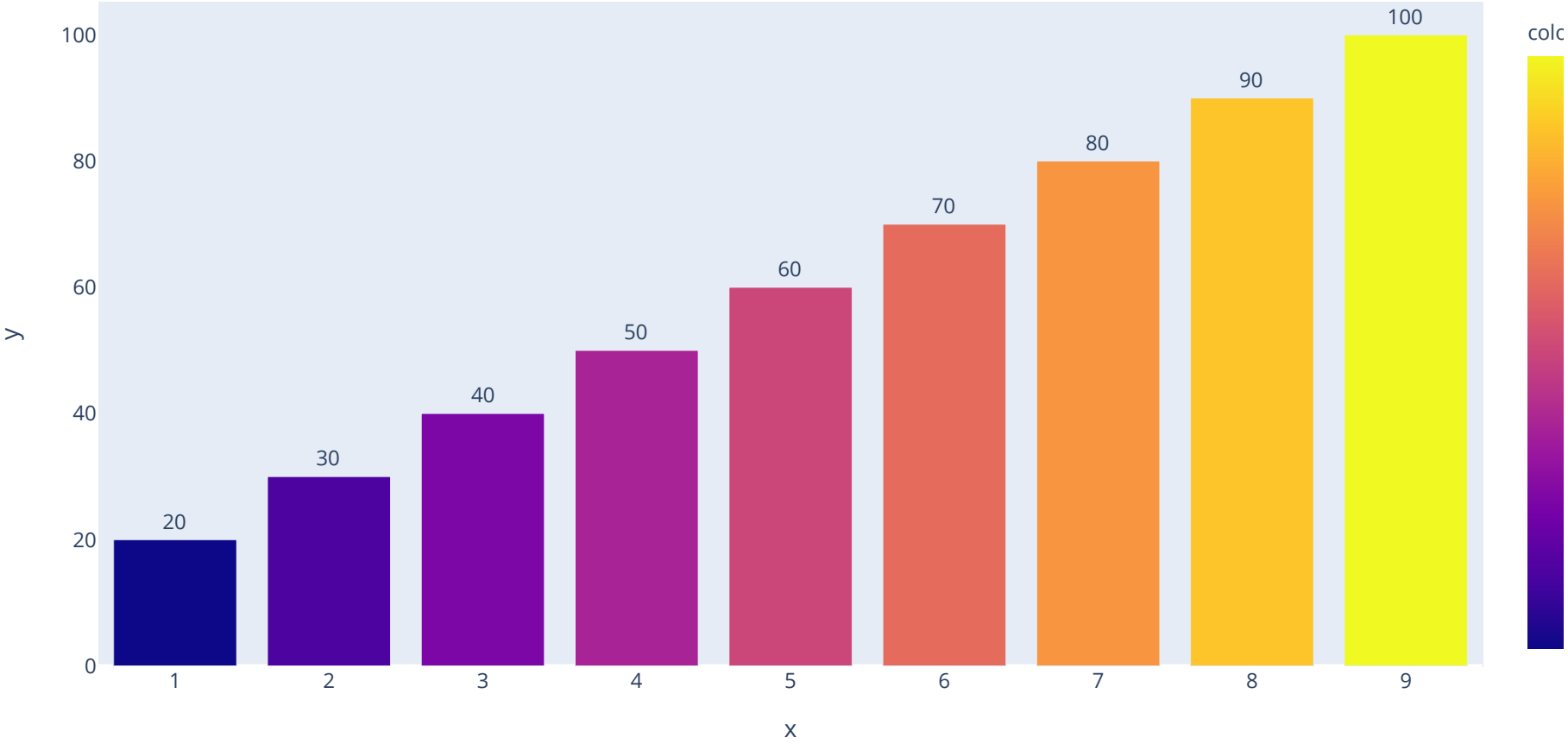


```
In [92]: x = np.arange(1,10)
y = np.arange(20,110,10)
fig = px.bar(x=x, y=y,color=y,text=y)
fig.layout.title.text = "Bar Plot - Plotly Express"
fig.update_traces(textposition='outside')

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

Bar Plot - Plotly Express



▼ 100% Stacked Bar Chart

```
In [93]: col1 = ['Strongly Agree' , 'Agree' , 'Neutral' , 'Disagree' , 'Strongly Disagree',]
index1 = ['Python' , 'Java' , 'Julia' , 'C++' , 'C']
review = np.array([[428, 111, 70, 101, 80],
                   [370, 222, 80, 104, 70],
                   [298, 121, 90, 102, 60],
                   [310, 141, 100, 109, 56],
                   [400, 121, 110, 107, 78]])

rating = pd.DataFrame(data=review,index=index1,columns=col1)
rating
```

Out[93]:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Python	428	111	70	101	80
Java	370	222	80	104	70
Julia	298	121	90	102	60
C++	310	141	100	109	56
C	400	121	110	107	78

```
In [94]: rating['Total'] = rating.sum(axis=1)
rating
```

Out[94]:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Python	428	111	70	101	80	790
Java	370	222	80	104	70	846
Julia	298	121	90	102	60	671
C++	310	141	100	109	56	716
C	400	121	110	107	78	816

```
In [95]: rating = rating.assign(**{'Strongly Agree (%)': np.nan,
                                'Agree (%)' : np.nan,
                                'Neutral (%)': np.nan ,
                                'Disagree (%)' : np.nan,
                                'Strongly Disagree (%)': np.nan,
                                })
rating
```

Out[95]:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Python	428	111	70	101	80	790	NaN	NaN	NaN	NaN	NaN
Java	370	222	80	104	70	846	NaN	NaN	NaN	NaN	NaN
Julia	298	121	90	102	60	671	NaN	NaN	NaN	NaN	NaN
C++	310	141	100	109	56	716	NaN	NaN	NaN	NaN	NaN
C	400	121	110	107	78	816	NaN	NaN	NaN	NaN	NaN

```
In [96]: for i in range(0,len(rating['Strongly Agree'])):
          k=0
          for j in range(int(len(rating.iloc[0])/2)+1 , len(rating.iloc[0])):
              rating.iat[i,j] = np.round((rating.iat[i,k] / rating.iat[i,5])*100 ,decimals=2)
              k=k+1
rating
```

Out[96]:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Python	428	111	70	101	80	790	54.18	14.05	8.86	12.78	10.13
Java	370	222	80	104	70	846	43.74	26.24	9.46	12.29	8.27
Julia	298	121	90	102	60	671	44.41	18.03	13.41	15.20	8.94
C++	310	141	100	109	56	716	43.30	19.69	13.97	15.22	7.82
C	400	121	110	107	78	816	49.02	14.83	13.48	13.11	9.56

In [100]:

```
fig = go.Figure()

# Trace to plot "Strongly Agree" percentage
fig.add_trace(
    go.Bar(
        x= rating['Strongly Agree (%)'],
        y= rating.index,
        marker= dict (color = '#2E7D32',line=dict(color='#2E7D32',width=2)),
        name = 'Strongly Agree (%)',
        orientation='h',
        textposition='auto',
    )
)

# Trace to plot "Agree" percentage
fig.add_trace(
    go.Bar(
        x= rating['Agree (%)'],
        y= rating.index,
        marker= dict (color = '#8BC34A',line=dict(color='#8BC34A',width=2)),
        name = 'Agree (%)',
        orientation='h',
        textposition='auto',
    )
)

# Trace to plot "Neutral" percentage
fig.add_trace(
    go.Bar(
        x= rating['Neutral (%)'],
        y= rating.index,
        marker= dict (color = '#D4E157',line=dict(color='#D4E157',width=2)),
        name = 'Neutral (%)',
        orientation='h',
        textposition='auto',
    )
)

# Trace to plot "Disagree" percentage
fig.add_trace(
    go.Bar(
        x= rating['Disagree (%)'],
        y= rating.index,
        marker= dict (color = '#FFB300',line=dict(color='#FFB300',width=2)),
        name = 'Disagree (%)',
        orientation='h',
        textposition='auto',
    )
)

# Trace to plot "Strongly Disagree" percentage
fig.add_trace(
    go.Bar(
        x= rating['Strongly Disagree (%)'],
        y= rating.index,
        marker= dict (color = '#FF7043',line=dict(color='#FF7043',width=2)),
        name = 'Strongly Disagree (%)',
        orientation='h',
        textposition='auto',
    )
)

# Layout setting
fig.update_layout(
    title=dict(text = "Best Programming Language",x=0.44,y=0.95,font_size=20),
    barmode = 'stack',
    width=1000,
    height=500,
    margin=dict(l=70, r=0, t=70, b=70),
    paper_bgcolor='rgb(248, 248, 255)',
    plot_bgcolor='rgb(248, 248, 255)',
)

annotations =[]

# Displaying bar percentage label for "Strongly Agree"
for perc, lang in zip(rating.iloc[:,6],rating.index):
    # Labeling the bar percentage
    annotations.append(dict(xref='x',
                            yref='y',
                            y=lang,
                            x=perc/2 ,
                            text=str(perc) + ' %',
                            font=dict(family='Arial', size=12,color='white'),
```

```
showarrow=False))

# Displaying bar percentage Label for "Agree"
i=0
for perc, lang in zip(rating.iloc[:,7],rating.index):
    # Labeling the bar percentage
    annotations.append(dict(xref='x',
                            yref='y',
                            y=lang,
                            x=perc/2 + rating.iloc[i,6],
                            text=str(perc) + ' %',
                            font=dict(family='Arial', size=12,color='white'),
                            showarrow=False))

    i+=1

# Displaying bar percentage Label for "Neutral"
i=0
for perc, lang in zip(rating.iloc[:,8],rating.index):
    # Labeling the bar percentage
    annotations.append(dict(xref='x',
                            yref='y',
                            y=lang,
                            x=perc/2 + rating.iloc[i,6]+rating.iloc[i,7],
                            text=str(perc) + ' %',
                            font=dict(family='Arial', size=12,color='black'),
                            showarrow=False))

    i+=1

# Displaying bar percentage Label for "Disagree"
i=0
for perc, lang in zip(rating.iloc[:,9],rating.index):
    # Labeling the bar percentage
    annotations.append(dict(xref='x',
                            yref='y',
                            y=lang,
                            x=perc/2 + rating.iloc[i,6]+rating.iloc[i,7]+rating.iloc[i,8],
                            text=str(perc) + ' %',
                            font=dict(family='Arial', size=12,color='black'),
                            showarrow=False))

    i+=1

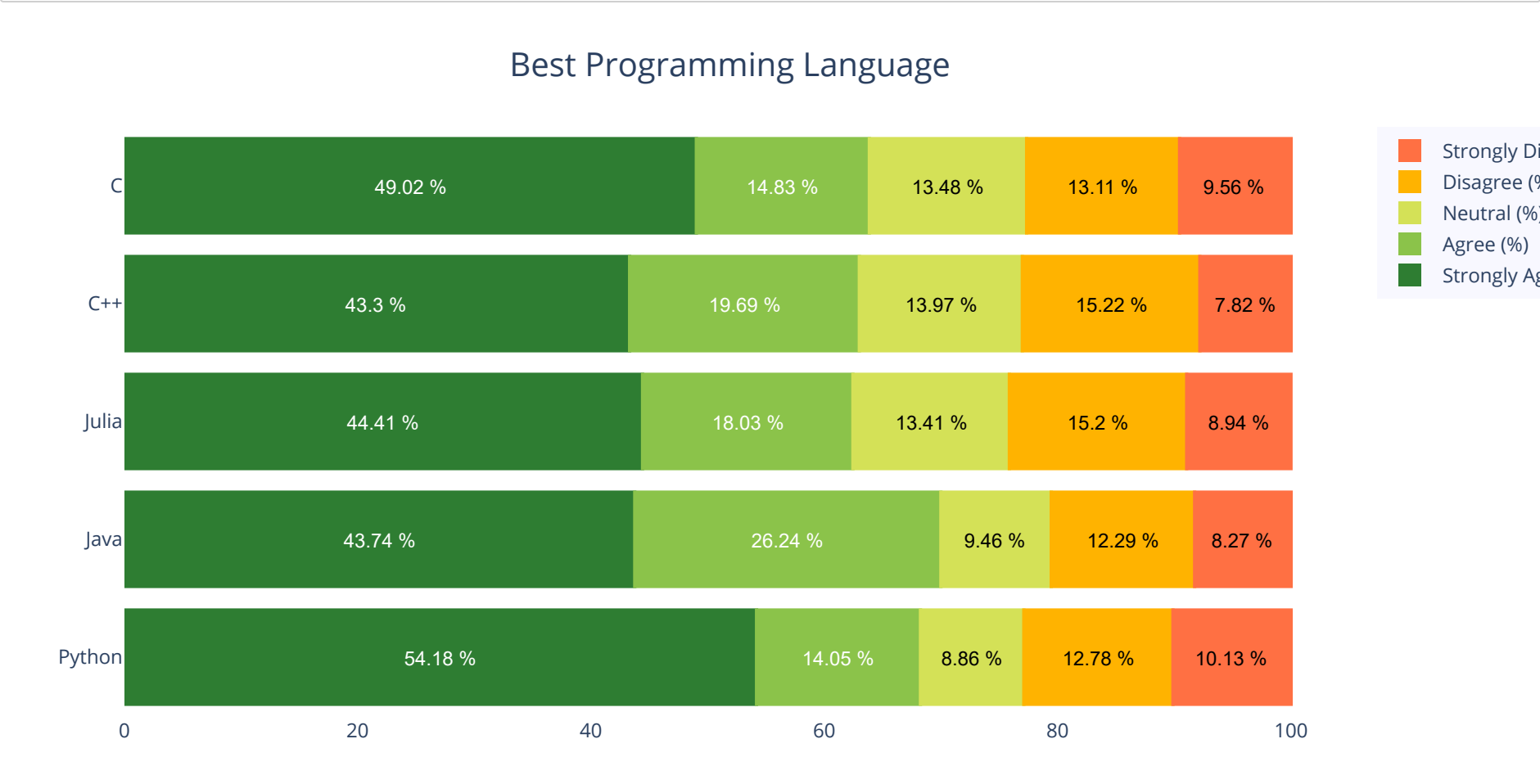
# Displaying bar percentage Label for "Strongly Disagree"
i=0
for perc, lang in zip(rating.iloc[:,10],rating.index):
    # Labeling the bar percentage
    annotations.append(dict(xref='x',
                            yref='y',
                            y=lang,
                            x=perc/2 + rating.iloc[i,6]+rating.iloc[i,7]+rating.iloc[i,8] + rating.iloc[i,9],
                            text=str(perc) + ' %',
                            font=dict(family='Arial', size=12,color='black'),
                            showarrow=False))

    i+=1

fig.update_layout(annotations=annotations)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```





In [99]:

```
#Optimized code for above visualization
fig = go.Figure()
cols = ['#2E7D32' , '#8BC34A' , '#D4E157' , '#FFB300' , '#FF7043']

for i in range (0,5):
    fig.add_trace(
        go.Bar(
            x= rating.iloc[:,6+i],
            y= rating.index,
            marker= dict (color =cols[i],line=dict(color=cols[i],width=2)),
            name = 'Strongly Agree (%)',
            orientation='h',
            textposition='auto',
        )
    )

fig.update_layout(
    title=dict(text = "Best Programming Language",x=0.44,y=0.95,font_size=20),
    barmode = 'stack',
    width=1000,
    height=500,
    margin=dict(l=70, r=0, t=70, b=70),
    paper_bgcolor='rgb(248, 248, 255)',
    plot_bgcolor='rgb(248, 248, 255)',
)

annotations =[]

i=0
for j in range(1,6):
    if j==1:
        for perc, lang in zip(rating.iloc[:,5+j],rating.index):
            # Labeling the bar percentage
            annotations.append(dict(xref='x',
                                    yref='y',
                                    y=lang,
                                    x=perc/2 ,
                                    text=str(perc) + ' %',
                                    font=dict(family='Arial', size=12,color='white'),
                                    showarrow=False))
        sum1 = rating.iloc[:,5+j]

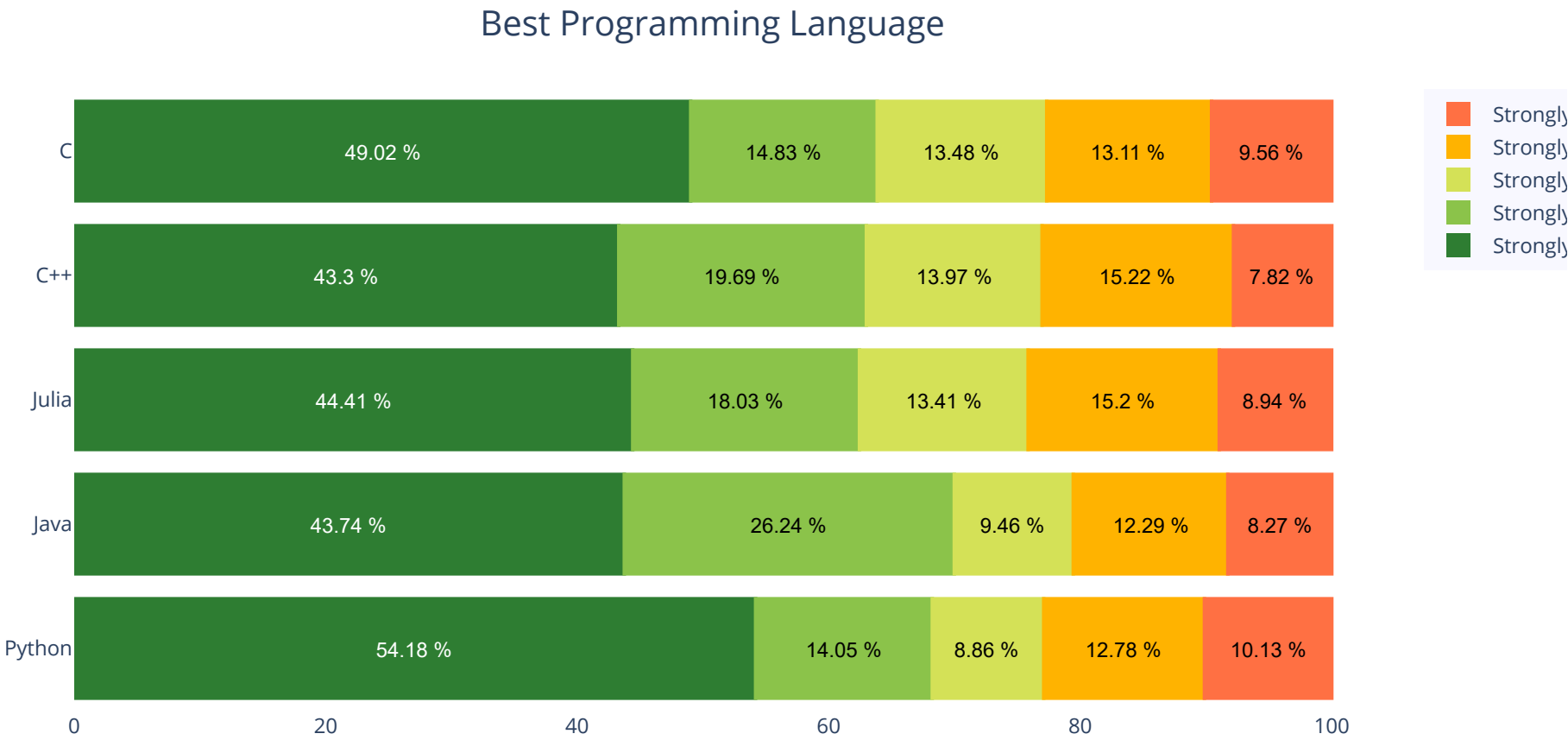
    else:
        i=0
        for perc, lang in zip(rating.iloc[:,5+j],rating.index):
            # Labeling the bar percentage
            annotations.append(dict(xref='x',
                                    yref='y',
                                    y=lang,
                                    x=perc/2 + sum1[i],
                                    text=str(perc) + ' %',
                                    font=dict(family='Arial', size=12,color='black'),
                                    showarrow=False))

            i+=1
        sum1 = sum1+ rating.iloc[:,5+j]

fig.update_layout(annotations=annotations)

# Hide grid lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```



Pie & Donut Chart

In [399]:

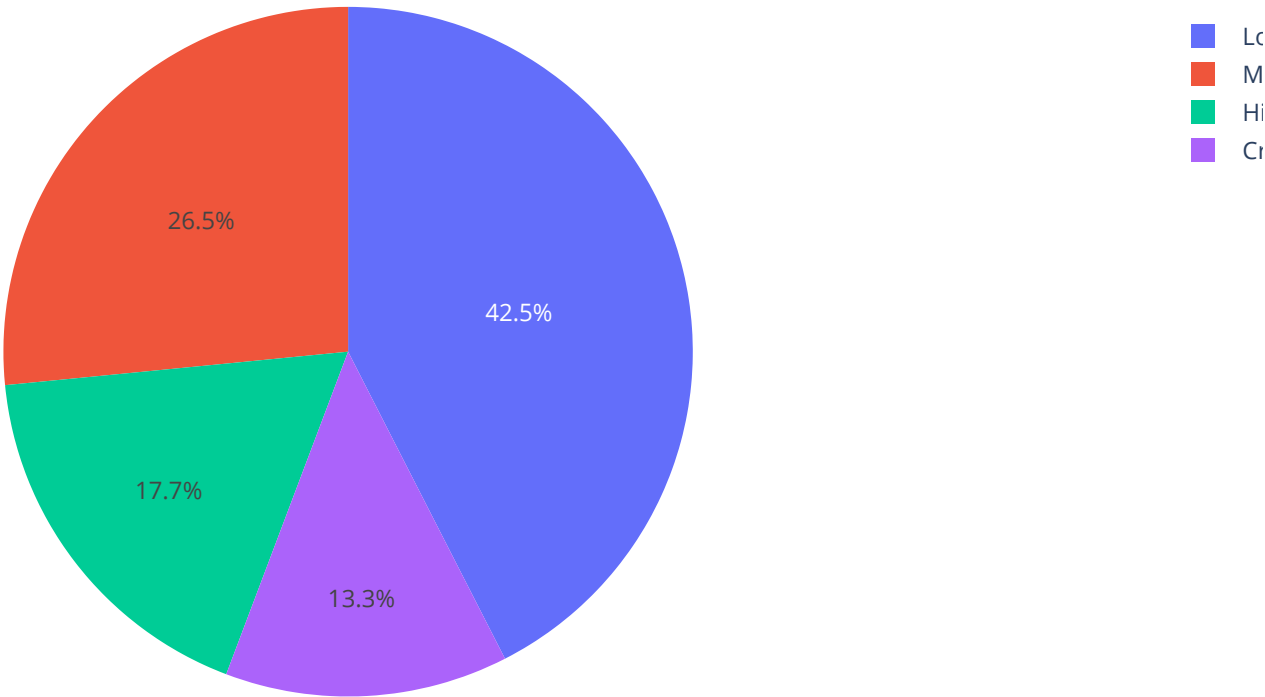
```
#Simple Pie Chart
tickets = [48 , 30 , 20 , 15]
status = ['Low' , 'Medium' , 'High' , 'Critical']
data = go.Pie(
    values= tickets,
    labels= status,
)

layout = go.Layout(
    title=dict(text = "Tickets by Priority",x=0.46,y=0.95,font_size=20)
)

fig = go.Figure(data=data,layout=layout)

fig.show()
```

Tickets by Priority

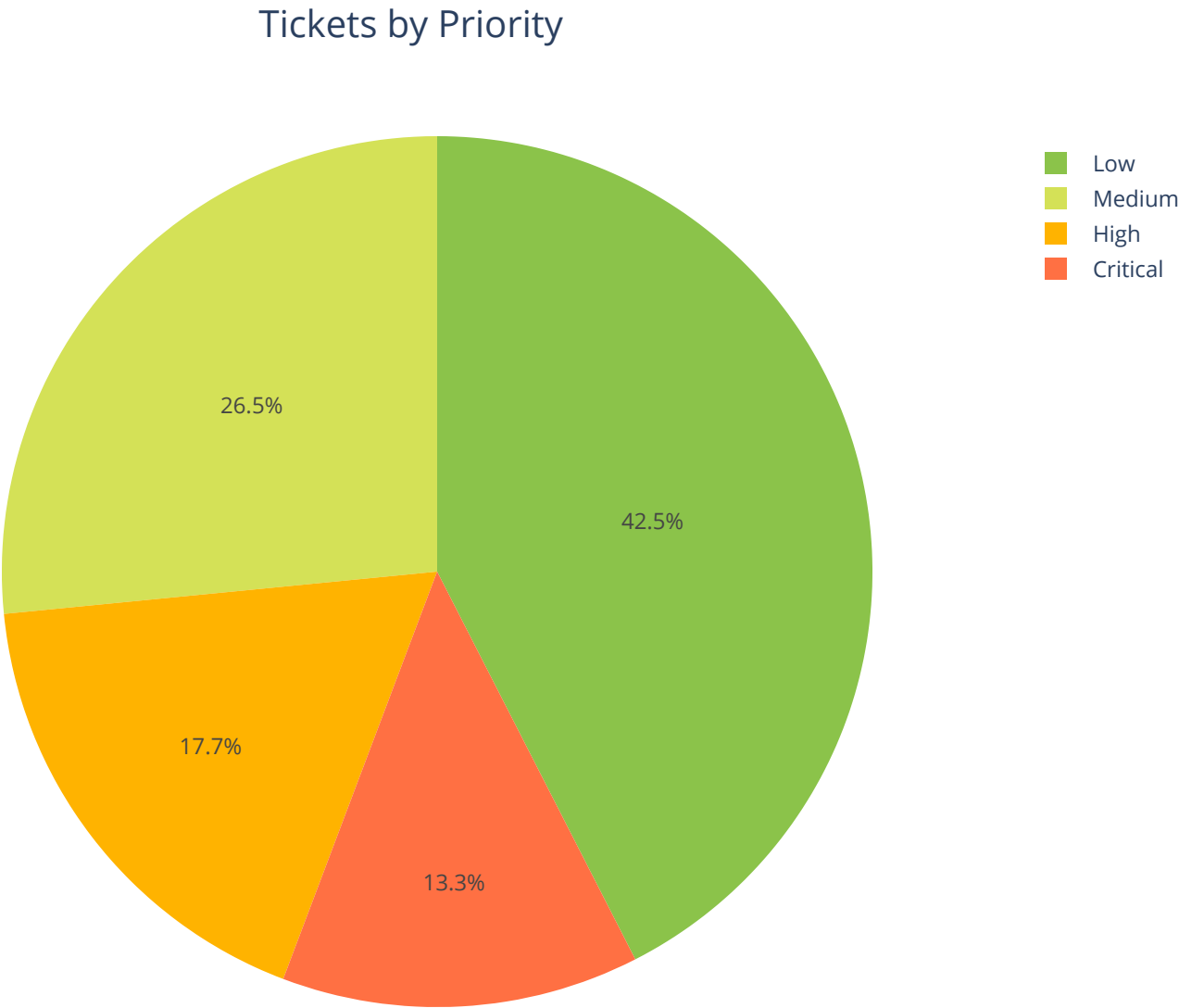



```
In [400]: #Changing color of Pie Chart
tickets = [48 , 30 , 20 , 15]
status = ['Low' , 'Medium' , 'High' , 'Critical']
colors = ['#8BC34A','#D4E157','#FFB300','#FF7043']
data = go.Pie(
    values= tickets,
    labels= status,
    marker=dict(colors=colors),
)

layout = go.Layout(
    title=dict(text = "Tickets by Priority",x=0.46,y=0.95,font_size=20),
    width=800,
    height=650
)

fig = go.Figure(data=data,layout=layout)

fig.show()
```

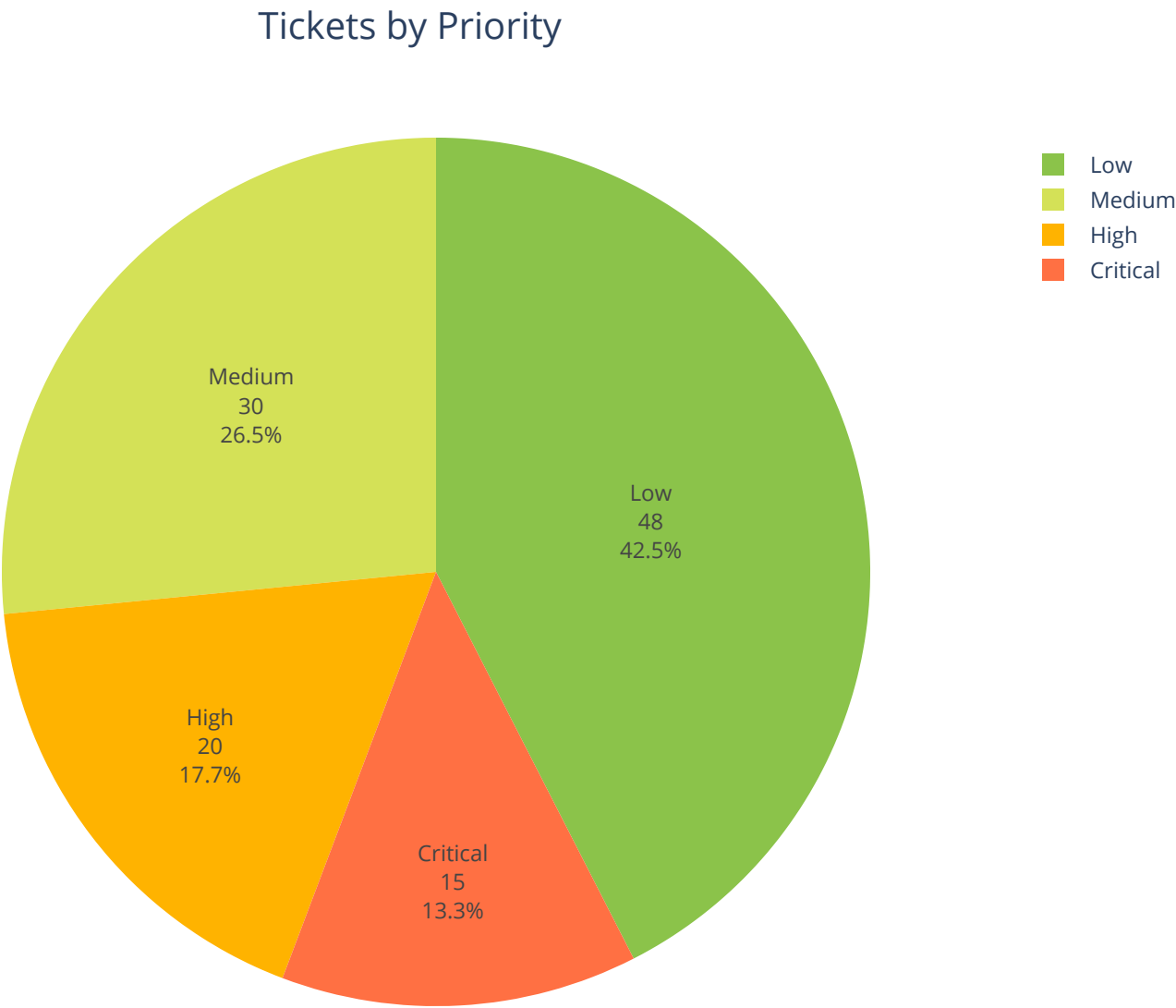


```
In [232]: # Displaying Label , Value & percent in Pie Chart using "textinfo" parameter
tickets = [48 , 30 , 20 , 15]
status = ['Low' , 'Medium' , 'High' , 'Critical']
colors = ['#8BC34A', '#D4E157', '#FFB300', '#FF7043']
data = go.Pie(
    values= tickets,
    labels= status,
    marker=dict(colors=colors),
    textinfo='label+value+percent'
)

layout = go.Layout(
    title=dict(text = "Tickets by Priority",x=0.46,y=0.95,font_size=20),
    width=800,
    height=650
)

fig = go.Figure(data=data,layout=layout)

fig.show()
```

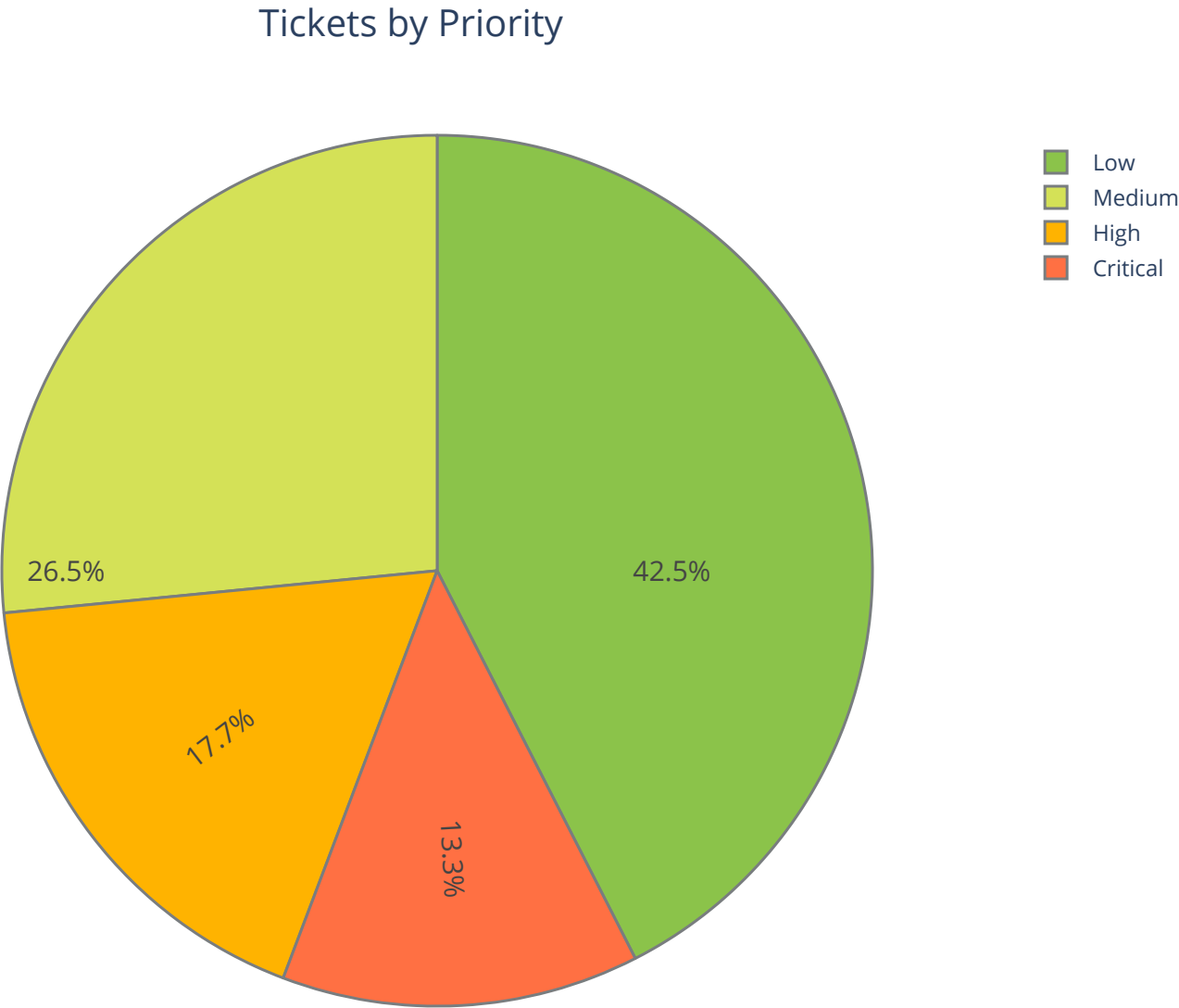


```
In [233]: # Changing Label orientation using "insidetextorientation" paramter
tickets = [48 , 30 , 20 , 15]
status = ['Low' , 'Medium' , 'High' , 'Critical']
colors = ['#8BC34A', '#D4E157', '#FFB300', '#FF7043']
data = go.Pie(
    values= tickets,
    labels= status,
    marker=dict(colors=colors,line=dict(color='#797D7F', width=1.5)),
    textinfo='percent',
    hoverinfo='label+value',
    textfont_size=15,
    insidetextorientation='radial'
)

layout = go.Layout(
    title=dict(text = "Tickets by Priority",x=0.46,y=0.95,font_size=20),
    width=800,
    height=650
)

fig = go.Figure(data=data,layout=layout)

fig.show()
```

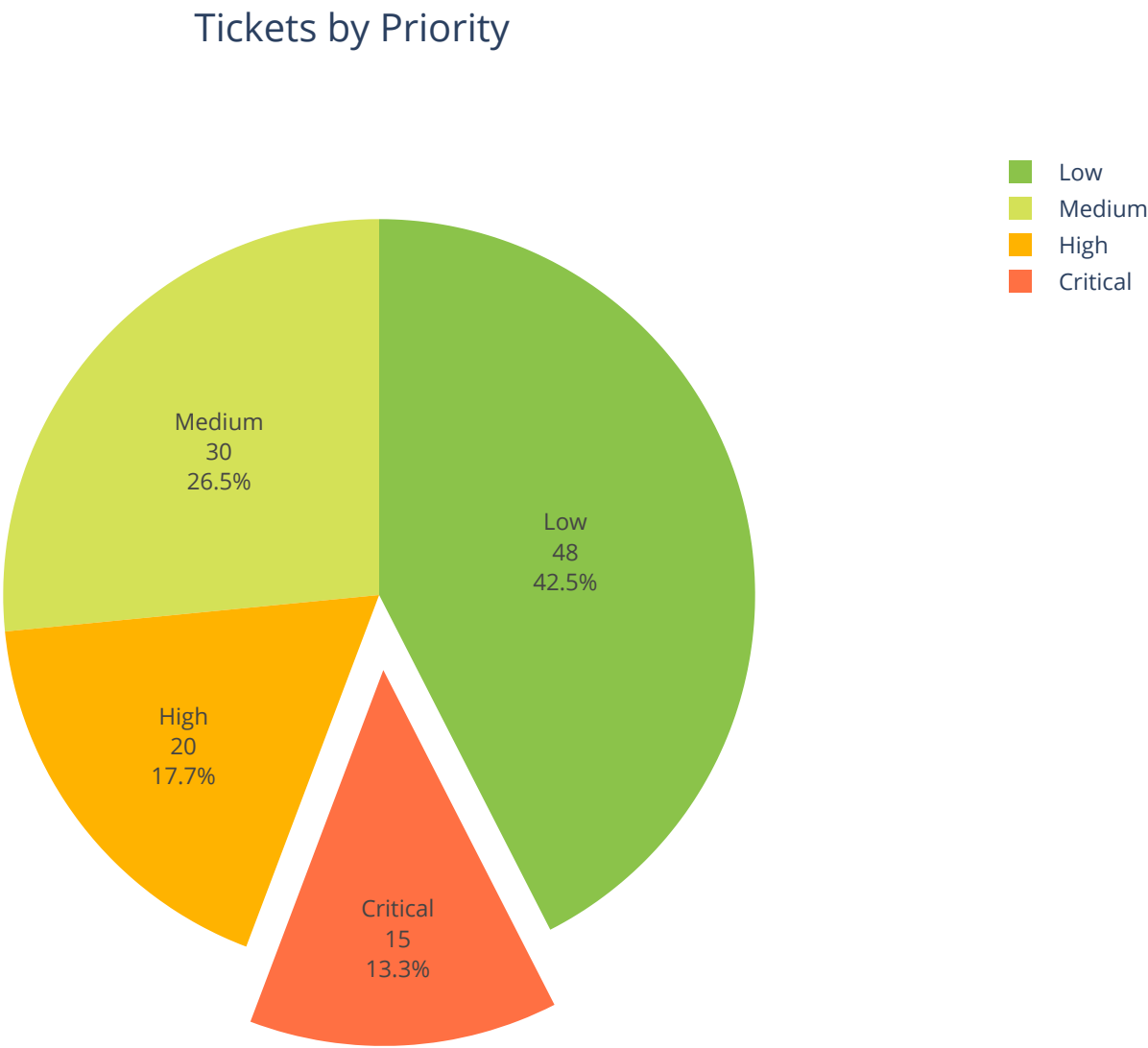


```
In [234]: #Explode 4th Slice using "pull" parameter
tickets = [48 , 30 , 20 , 15]
status = ['Low' , 'Medium' , 'High' , 'Critical']
colors = ['#8BC34A', '#D4E157', '#FFB300', '#FF7043']
data = go.Pie(
    values= tickets,
    labels= status,
    marker=dict(colors=colors),
    textinfo='label+value+percent',
    pull=[0, 0, 0, 0.2] #Explode 4th Slice
)

layout = go.Layout(
    title=dict(text = "Tickets by Priority",x=0.46,y=0.95,font_size=20),
    width=800,
    height=650
)

fig = go.Figure(data=data,layout=layout)

fig.show()
```



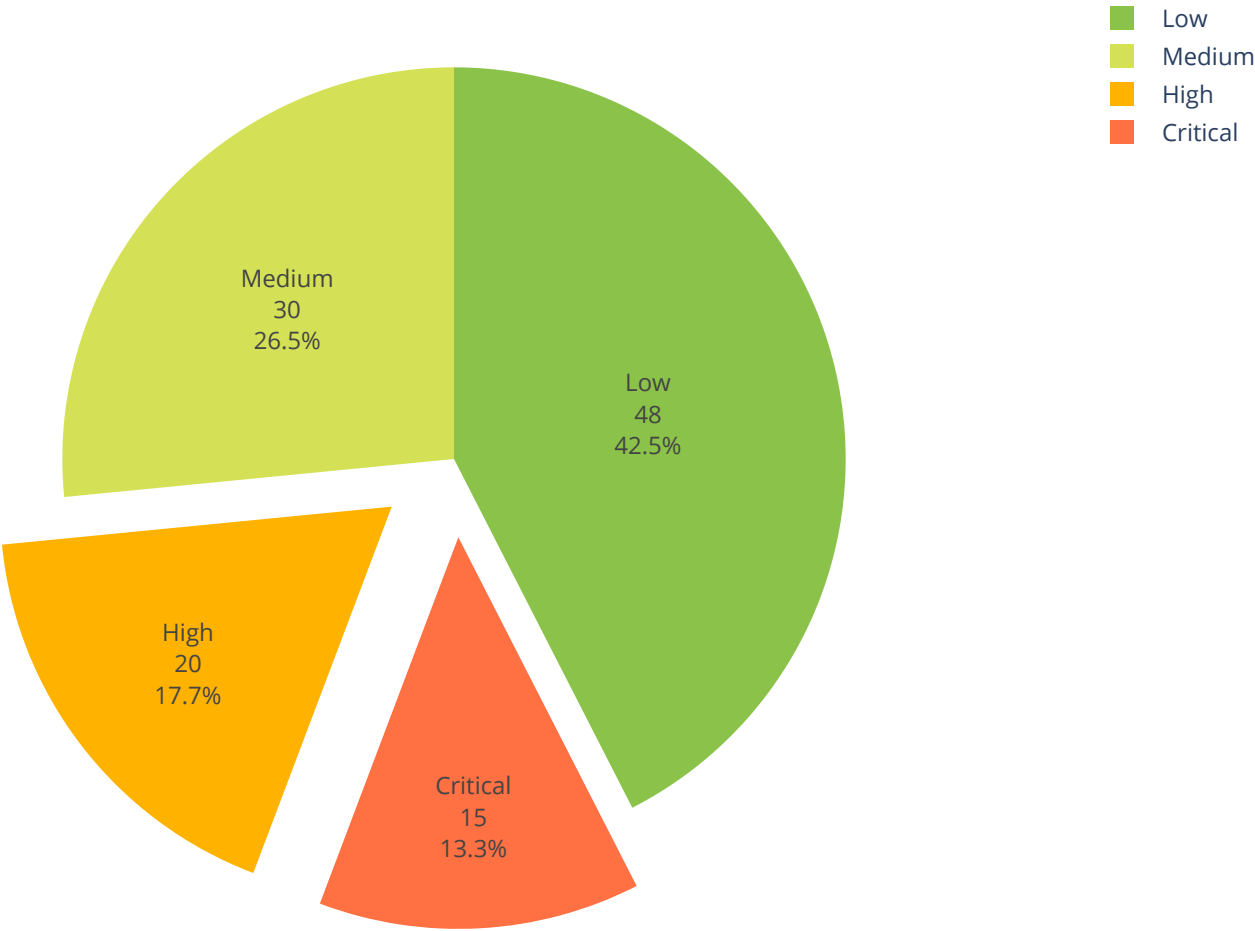
```
In [235]: #Explode 3rd & 4th Slice using "pull" parameter
tickets = [48 , 30 , 20 , 15]
status = ['Low' , 'Medium' , 'High' , 'Critical']
colors = ['#8BC34A', '#D4E157', '#FFB300', '#FF7043']
data = go.Pie(
    values= tickets,
    labels= status,
    marker=dict(colors=colors),
    textinfo='label+value+percent',
    pull=[0, 0, 0.2, 0.2]
)

layout = go.Layout(
    title=dict(text = "Tickets by Priority",x=0.46,y=0.95,font_size=20),
    width=800,
    height=650
)

fig = go.Figure(data=data,layout=layout)

fig.show()
```

Tickets by Priority



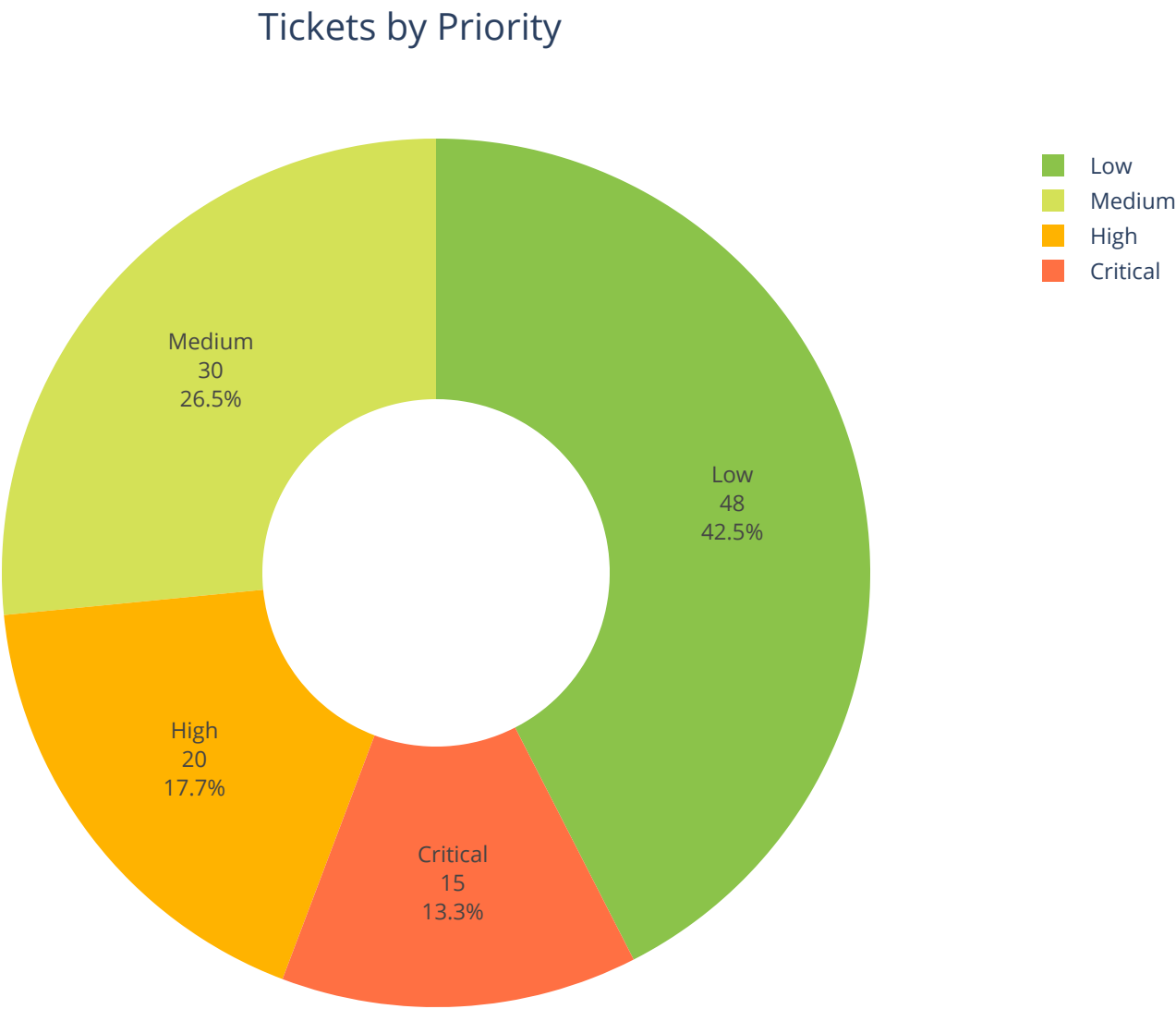
In [236]:

```
# Simple Donut Chart
tickets = [48 , 30 , 20 , 15]
status = ['Low' , 'Medium' , 'High' , 'Critical']
colors = ['#8BC34A', '#D4E157', '#FFB300', '#FF7043']
data = go.Pie(
    values= tickets,
    labels= status,
    marker=dict(colors=colors),
    textinfo='label+value+percent',
    hole=.4
)

layout = go.Layout(
    title=dict(text = "Tickets by Priority",x=0.46,y=0.95,font_size=20),
    width=800,
    height=650
)

fig = go.Figure(data=data,layout=layout)

fig.show()
```



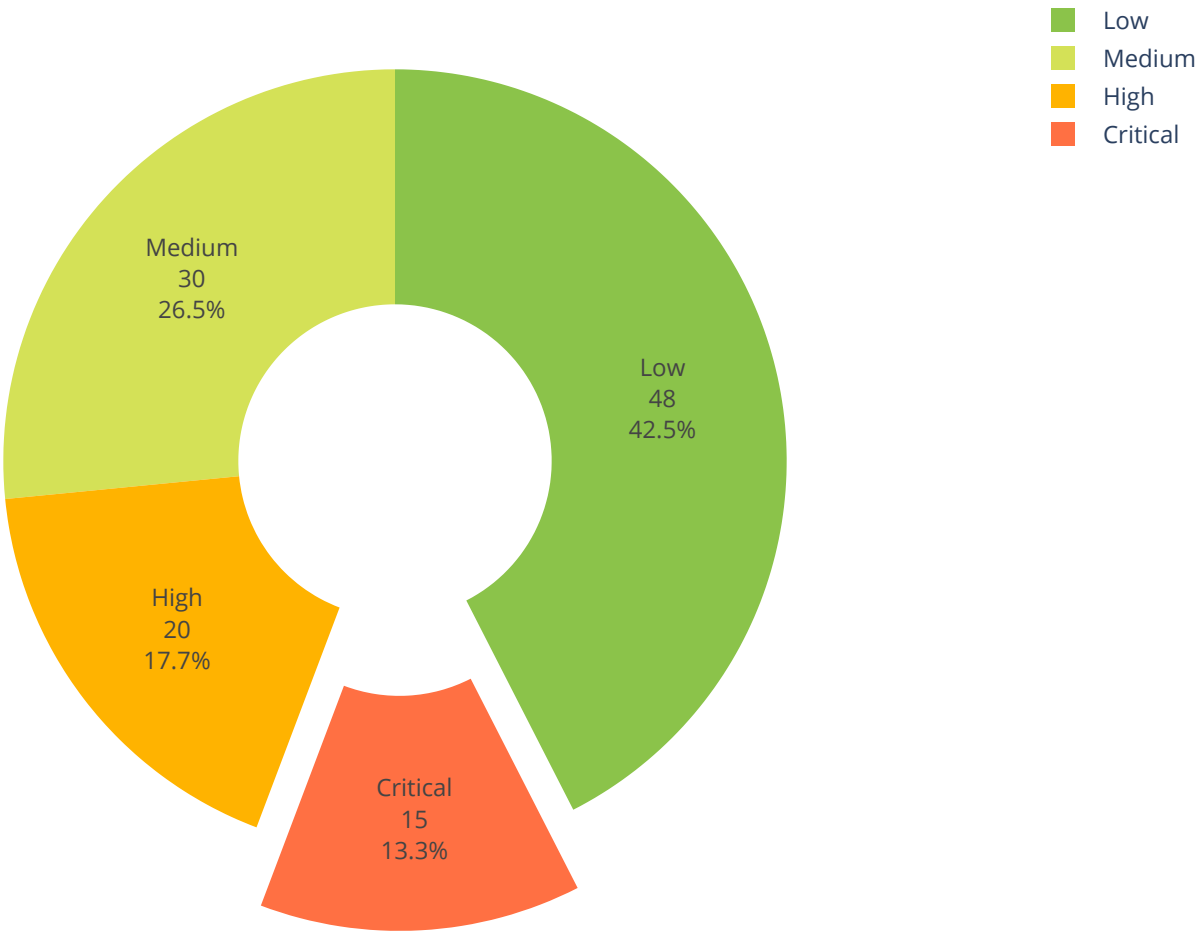
```
In [237]: #Explode 4th Slice using "pull" parameter
tickets = [48 , 30 , 20 , 15]
status = ['Low' , 'Medium' , 'High' , 'Critical']
colors = ['#8BC34A', '#D4E157', '#FFB300', '#FF7043']
data = go.Pie(
    values= tickets,
    labels= status,
    marker=dict(colors=colors),
    textinfo='label+value+percent',
    hole=.4,
    pull=[0, 0, 0, 0.2]
)

layout = go.Layout(
    title=dict(text = "Tickets by Priority",x=0.46,y=0.95,font_size=20),
    width=800,
    height=650
)

fig = go.Figure(data=data,layout=layout)

fig.show()
```

Tickets by Priority



```
In [401]: employment.head()
```

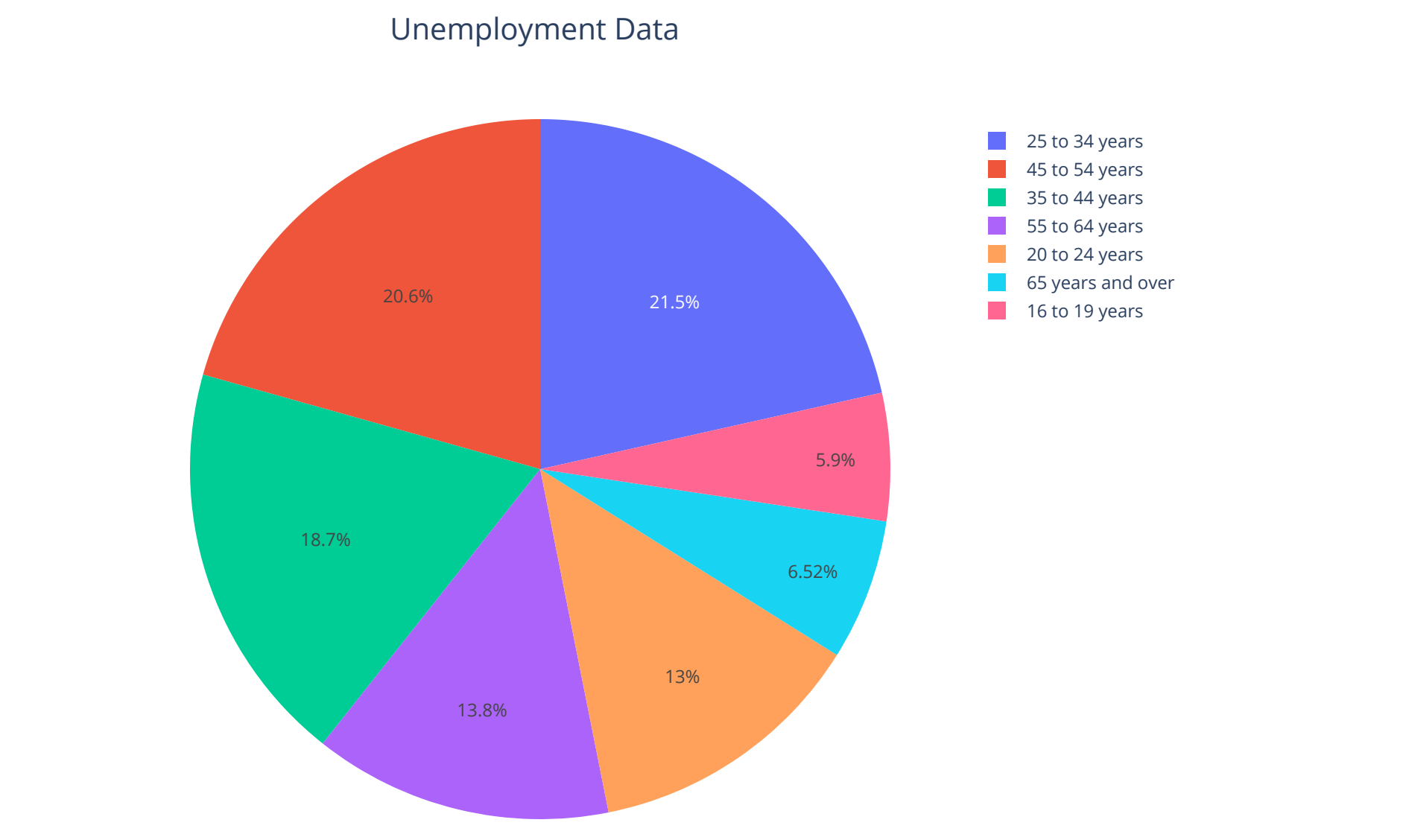
Out[401]:

	Age	Gender	Period	Unemployed
0	16 to 19 years	Men	2005-01-01	91000
1	20 to 24 years	Men	2005-01-01	175000
2	25 to 34 years	Men	2005-01-01	194000
3	35 to 44 years	Men	2005-01-01	201000
4	45 to 54 years	Men	2005-01-01	207000

```
In [402]: data = go.Pie(
            values= employment.Unemployed,
            labels= employment.Age,
            textinfo='percent',
            hoverinfo='label+value'
        )
    layout = go.Layout(
        title=dict(text = "Unemployment Data",x=0.44,y=0.95,font_size=20),
        width=800,
        height=650
    )

    fig = go.Figure(data=data,layout=layout)

    fig.show()
```



```
In [403]: suicide.head()
```

Out[403]:

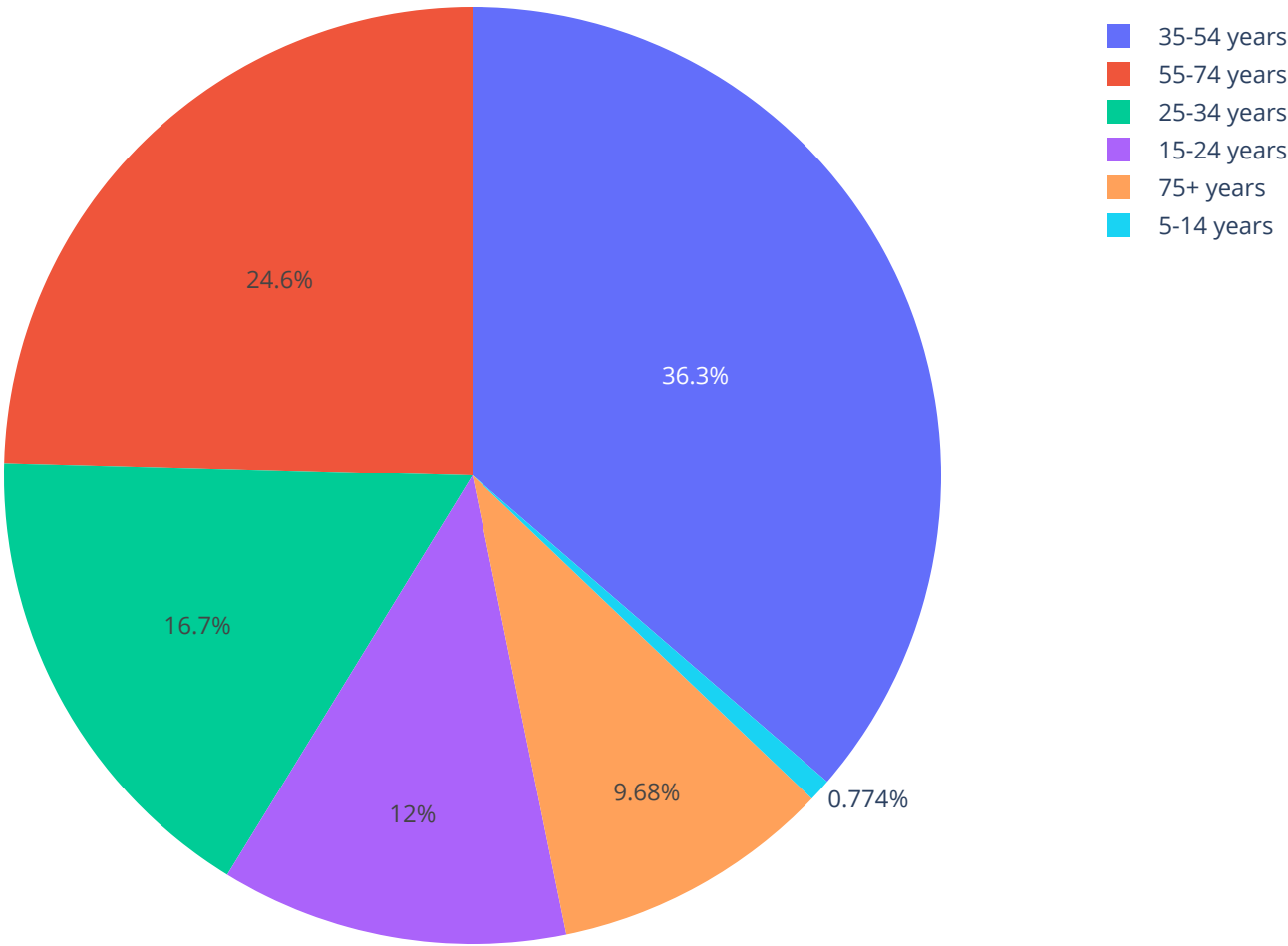
	country	year	sex	age	suicides_no	population	suicides/100k pop	country-year	HDI for year	gdp_for_year (\$)	gdp_per_capita (\$)	generation
0	Albania	1987	male	15-24 years	21	312900	6.71	Albania1987	NaN	2,156,624,900	796	Generation X
1	Albania	1987	male	35-54 years	16	308000	5.19	Albania1987	NaN	2,156,624,900	796	Silent
2	Albania	1987	female	15-24 years	14	289700	4.83	Albania1987	NaN	2,156,624,900	796	Generation X
3	Albania	1987	male	75+ years	1	21800	4.59	Albania1987	NaN	2,156,624,900	796	G.I. Generation
4	Albania	1987	male	25-34 years	9	274300	3.28	Albania1987	NaN	2,156,624,900	796	Boomers


```
In [404]: data = go.Pie(
            values= suicide['suicides_no'],
            labels= suicide['age'],
            textinfo='percent',
            hoverinfo='label+value'
        )
    layout = go.Layout(
        title=dict(text = "Suicide Data",x=0.44,y=0.95,font_size=20),
        width=800,
        height=650
    )

    fig = go.Figure(data=data,layout=layout)

    fig.show()
```

Suicide Data



In [242]: *# Display multiple Pie plots in one figure using Subplots*

```
tickets = [48 , 30 , 20 , 15]
status = ['Low' , 'Medium' , 'High' , 'Critical']
colors = ['#8BC34A', '#D4E157', '#FFB300', '#FF7043']

Assignee = ['Asif', 'Basit', 'John', 'Batista', 'Gabriel' , 'Paul' , 'Ravi']
Open = [17,18,29,33,38,39,42]

#Subplot initialization
fig = make_subplots(
    rows=1,
    cols=2,
    subplot_titles=("Tickets by Priority", "Tickets by Assignee"),

    specs=[[{'type':'domain'}, {'type':'domain'}]]
)

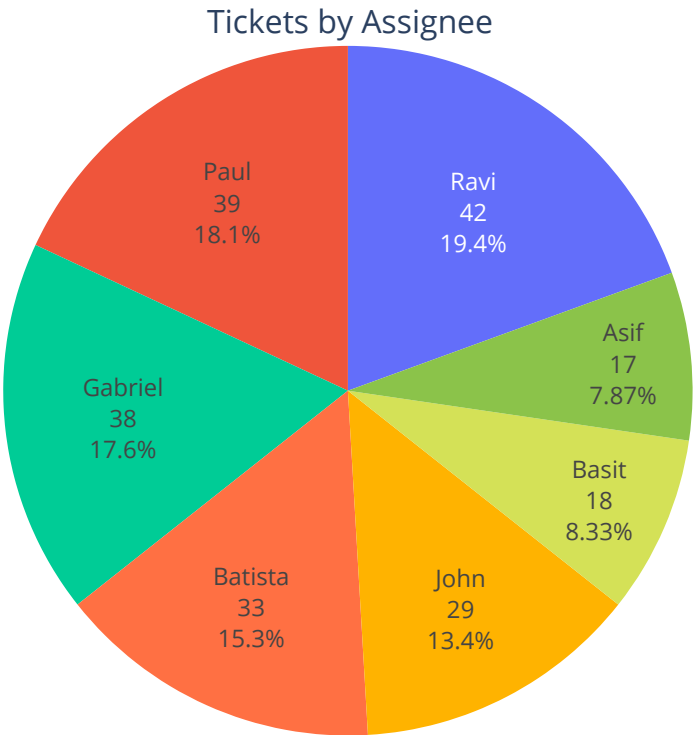
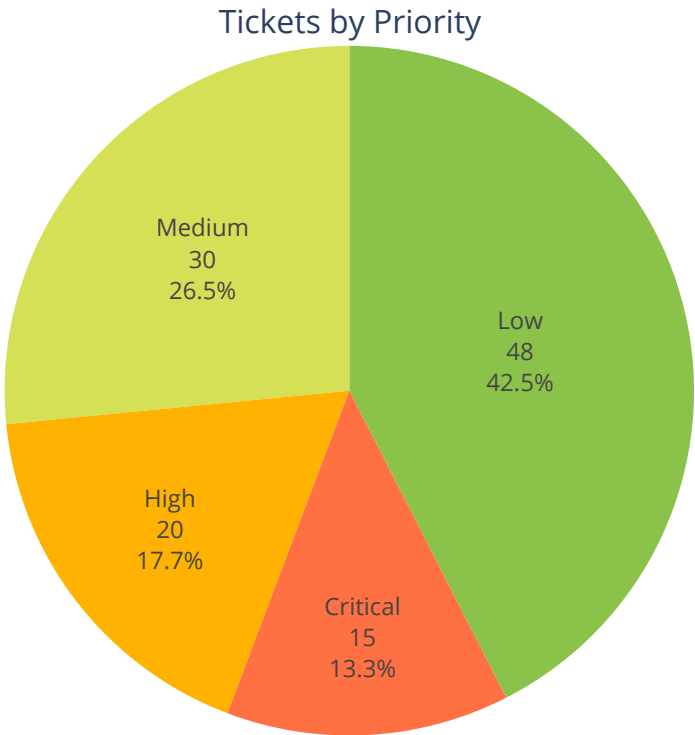
# Subplot - 1 (Add graph object trace to a figure)
fig.add_trace(go.Pie(
    values= tickets,
    labels= status,
    marker=dict(colors=colors),
    textinfo='label+value+percent'
),
    row=1, col=1
)

fig.add_trace(go.Pie(
    values= Open,
    labels= Assignee,
    marker=dict(colors=colors),
    textinfo='label+value+percent'
),
    row=1, col=2
)

fig.update_layout(
    paper_bgcolor= '#FFFDE7',
    plot_bgcolor= '#FFFDE7',
    title=dict(text = "Help Desk",x=0.5,y=0.95),
    title_font_size=30
)

fig.show()
```

Help Desk



In [243]: *# Display multiple Donut charts in one figure using Subplots*

```

tickets = [48 , 30 , 20 , 15]
status = ['Low' , 'Medium' , 'High' , 'Critical']
colors = ['#8BC34A','#D4E157','#FFB300','#FF7043']

Assignee = ['Asif','Basit','John','Batista', 'Gabriel' , 'Paul' , 'Ravi']
Open = [17,18,29,33,38,39,42]

#Subplot initialization
fig = make_subplots(
    rows=1,
    cols=2,
    subplot_titles=("Tickets by Priority", "Tickets by Assignee"),
    specs=[[{'type':'domain'}, {'type':'domain'}]]
)

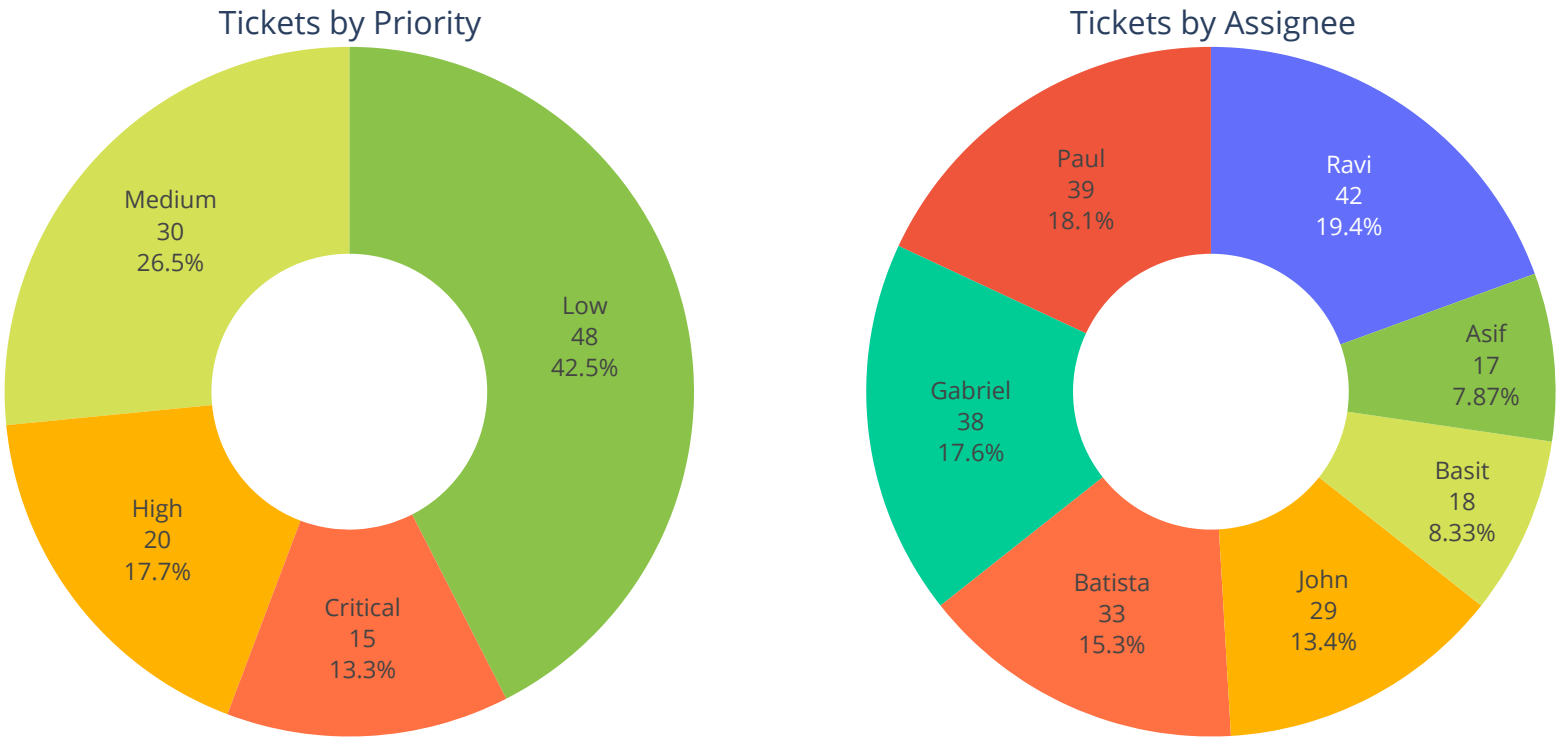
# Subplot - 1 (Add graph object trace to a figure)
fig.add_trace(go.Pie(
    values= tickets,
    labels= status,
    hole = .4,
    marker=dict(colors=colors),
    textinfo='label+value+percent',
    hoverinfo='label'
),
    row=1, col=1
)

fig.add_trace(go.Pie(
    values= Open,
    labels= Assignee,
    hole = .4,
    marker=dict(colors=colors),
    textinfo='label+value+percent',
    hoverinfo='label'
),
    row=1, col=2
)

fig.update_layout(
    paper_bgcolor= '#FFFDE7',
    plot_bgcolor= '#FFFDE7',
    title=dict(text = "Help Desk",x=0.5,y=0.95),
    title_font_size=30
)

fig.show()
```

Help Desk



In [407]: *# Display multiple Pie & Donut plots in one figure using Subplots*

```
tickets = [48 , 30 , 20 , 15]
priority = ['Low' , 'Medium' , 'High' , 'Critical']
colors = ['#8BC34A','#D4E157','#FFB300','#FF7043']
group = ['Service Desk' , 'Problem' , 'Application' , 'Change']
status = ['Assigned', 'Pending' , 'New' , 'In Progress']
severity = ['Sev-4' , 'Sev-3' , 'sev-2' , 'sev-1']

#Subplot initialization
fig = make_subplots(
    rows=2,
    cols=2,
    subplot_titles=("Tickets by Priority", "Tickets by Severity",
                    "Tickets by Group", "Tickets by Status"),
    specs=[[{'type':'domain'}, {'type':'domain'}],[{'type':'domain'}, {'type':'domain'}]]
)

#Change Subplot title font size
for i in fig['layout']['annotations']:
    i['font']['size'] = 17

# Subplot - 1 (Add graph object trace to a figure)
fig.add_trace(go.Pie(
    values= tickets,
    labels= priority,
    marker=dict(colors=colors),
    textinfo='label+value+percent',
    hoverinfo='label',
    ),
    row=1, col=1
)

# Subplot - 2 (Add graph object trace to a figure)
fig.add_trace(go.Pie(
    values= Open,
    labels= severity,
    marker=dict(colors=colors),
    textinfo='label+value+percent',
    hoverinfo='label',
    ),
    row=1, col=2
)

# Subplot - 3 (Add graph object trace to a figure)
fig.add_trace(go.Pie(
    values= tickets,
    labels= group,
    hole = .4,
    marker=dict(colors=colors),
    textinfo='label+value+percent',
    hoverinfo='label'
    ),
    row=2, col=1
)

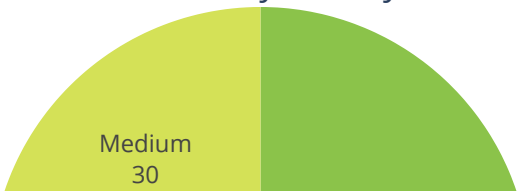
# Subplot - 4 (Add graph object trace to a figure)
fig.add_trace(go.Pie(
    values= Open,
    labels= status,
    hole = .4,
    marker=dict(colors=colors),
    textinfo='label+value+percent',
    hoverinfo='label'
    ),
    row=2, col=2
)

fig.update_layout(
    paper_bgcolor= '#FFFDE7',
    plot_bgcolor= '#FFFDE7',
    title=dict(text = "Help Desk",x=0.49,y=0.97,font_size=30),
    width=950,
    height=900,
    showlegend=False
)

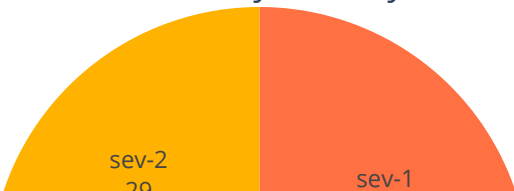
fig.show()
```

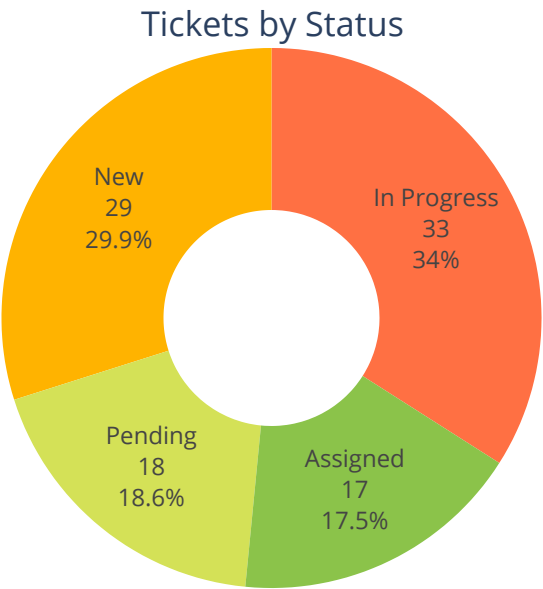
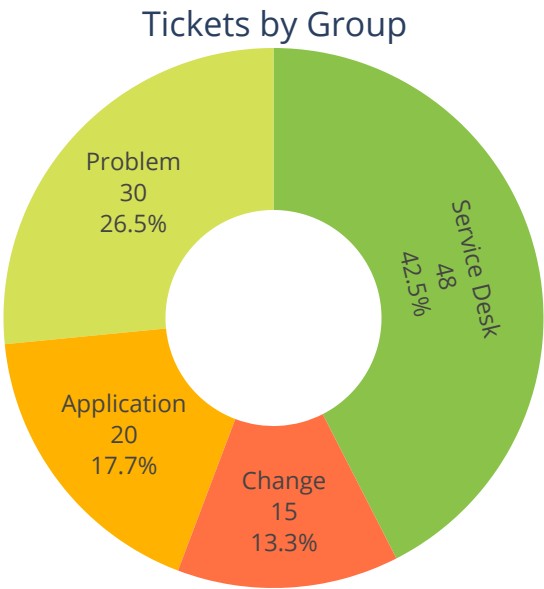
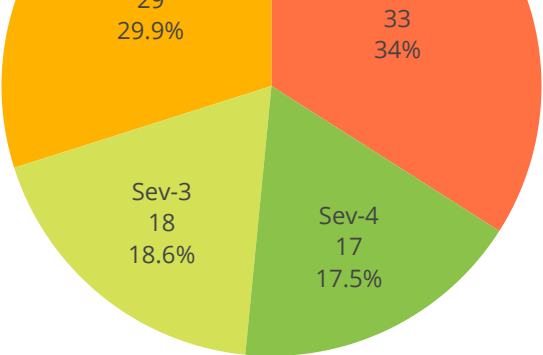
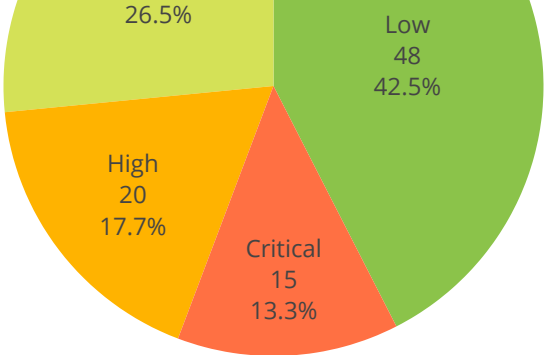
Help Desk

Tickets by Priority



Tickets by Severity





Pie Chart using Plotly Express

```
In [408]: suicide.head()
```

Out[408]:

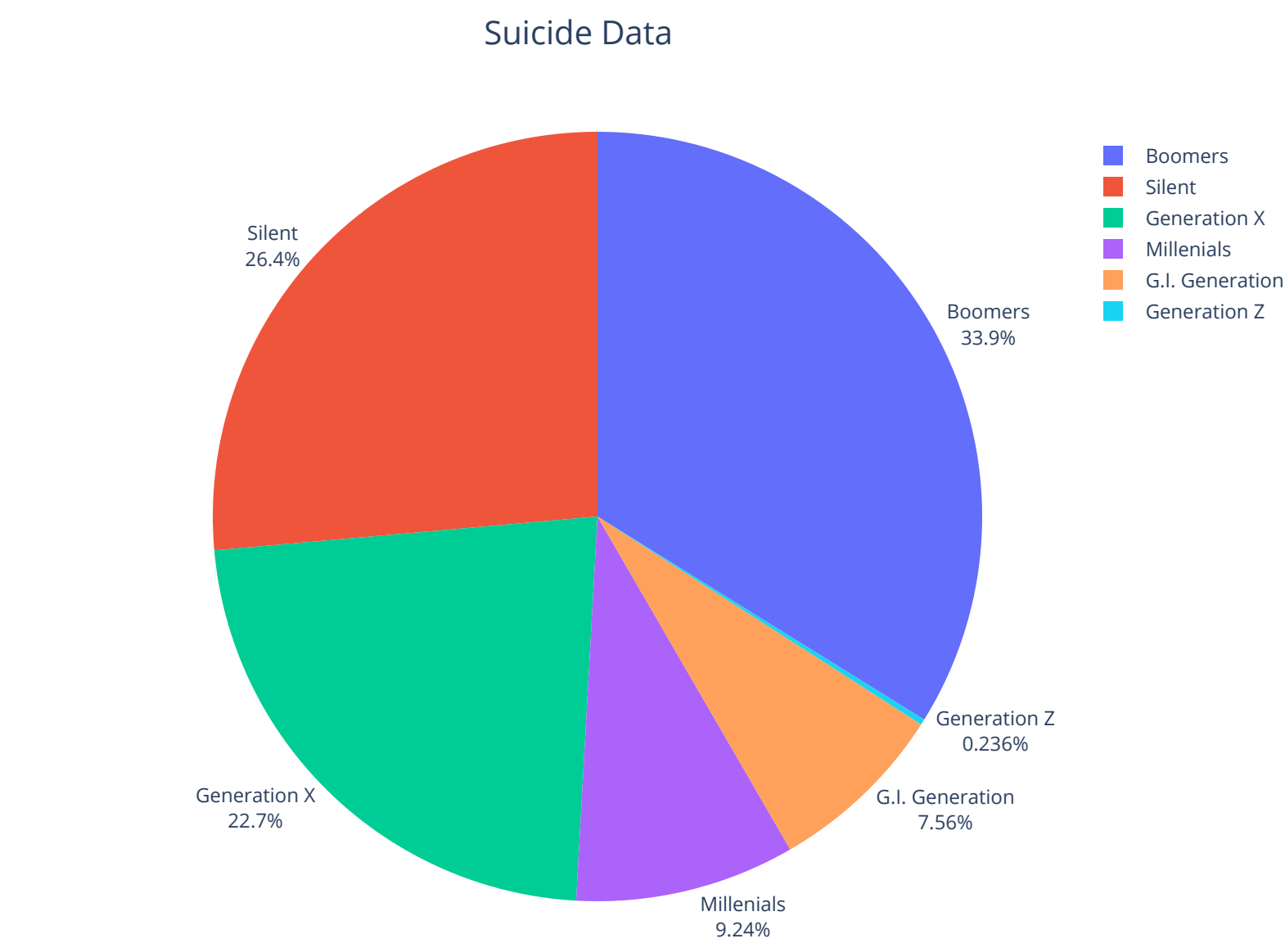
	country	year	sex	age	suicides_no	population	suicides/100k pop	country-year	HDI for year	gdp_for_year (\$)	gdp_per_capita (\$)	generation
0	Albania	1987	male	15-24 years	21	312900	6.71	Albania1987	NaN	2,156,624,900	796	Generation X
1	Albania	1987	male	35-54 years	16	308000	5.19	Albania1987	NaN	2,156,624,900	796	Silent
2	Albania	1987	female	15-24 years	14	289700	4.83	Albania1987	NaN	2,156,624,900	796	Generation X
3	Albania	1987	male	75+ years	1	21800	4.59	Albania1987	NaN	2,156,624,900	796	G.I. Generation
4	Albania	1987	male	25-34 years	9	274300	3.28	Albania1987	NaN	2,156,624,900	796	Boomers

```
In [409]: fig = px.pie(suicide, values='suicides_no', names='generation', title='Country')

fig.update_layout(
    title=dict(text = "Suicide Data",x=0.44,y=0.95,font_size=20),
    width=800,
    height=650
)

fig.update_traces(textposition='outside', textinfo='percent+label')

fig.show()
```



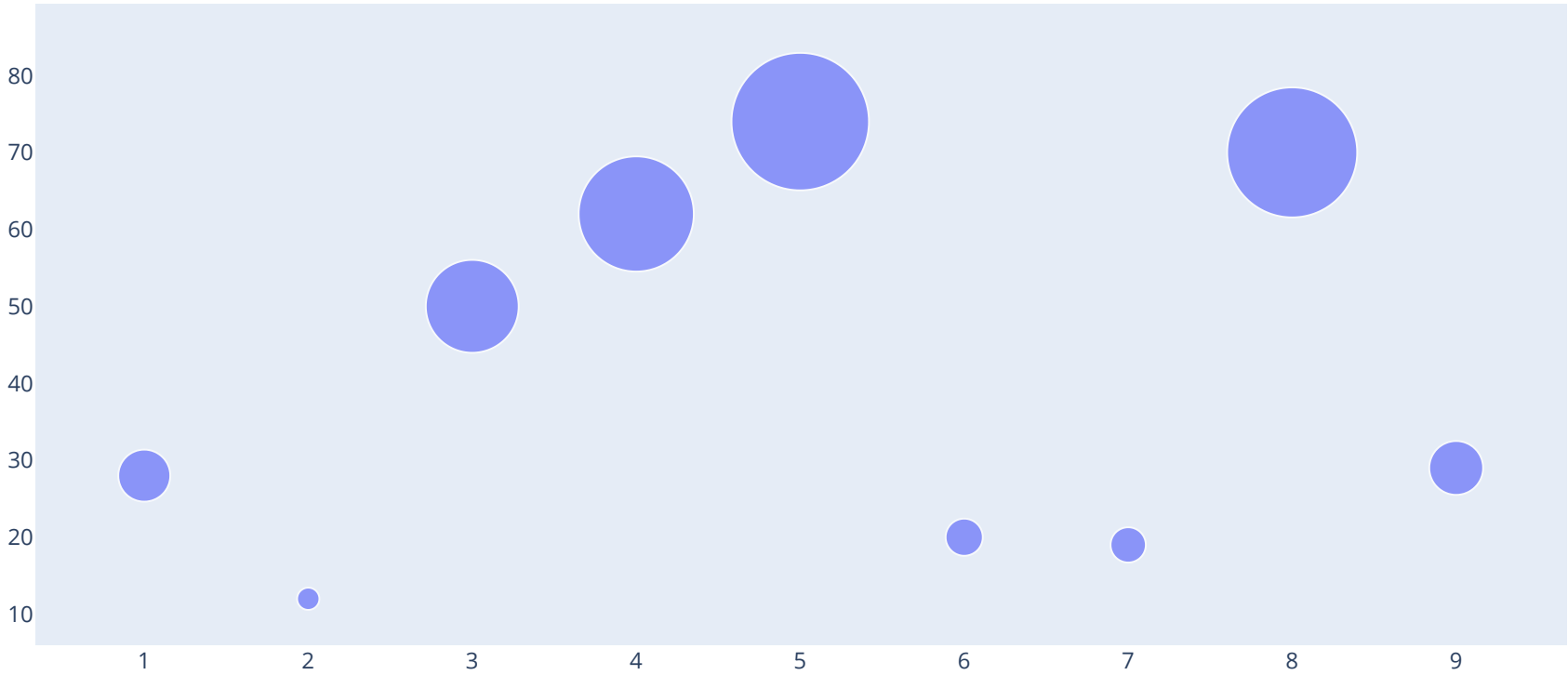
▼ **Bubble Chart**

```
In [101]: #Simple Bubble Chart
x = np.arange(1,10)
y = np.random.randint(1,100,9)
op = np.random.uniform(0.2,1 ,9)
data = go.Scatter(
    x = x,
    y = y,
    mode = 'markers',
    marker = dict(size = y),
)

fig = go.Figure(data=data)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

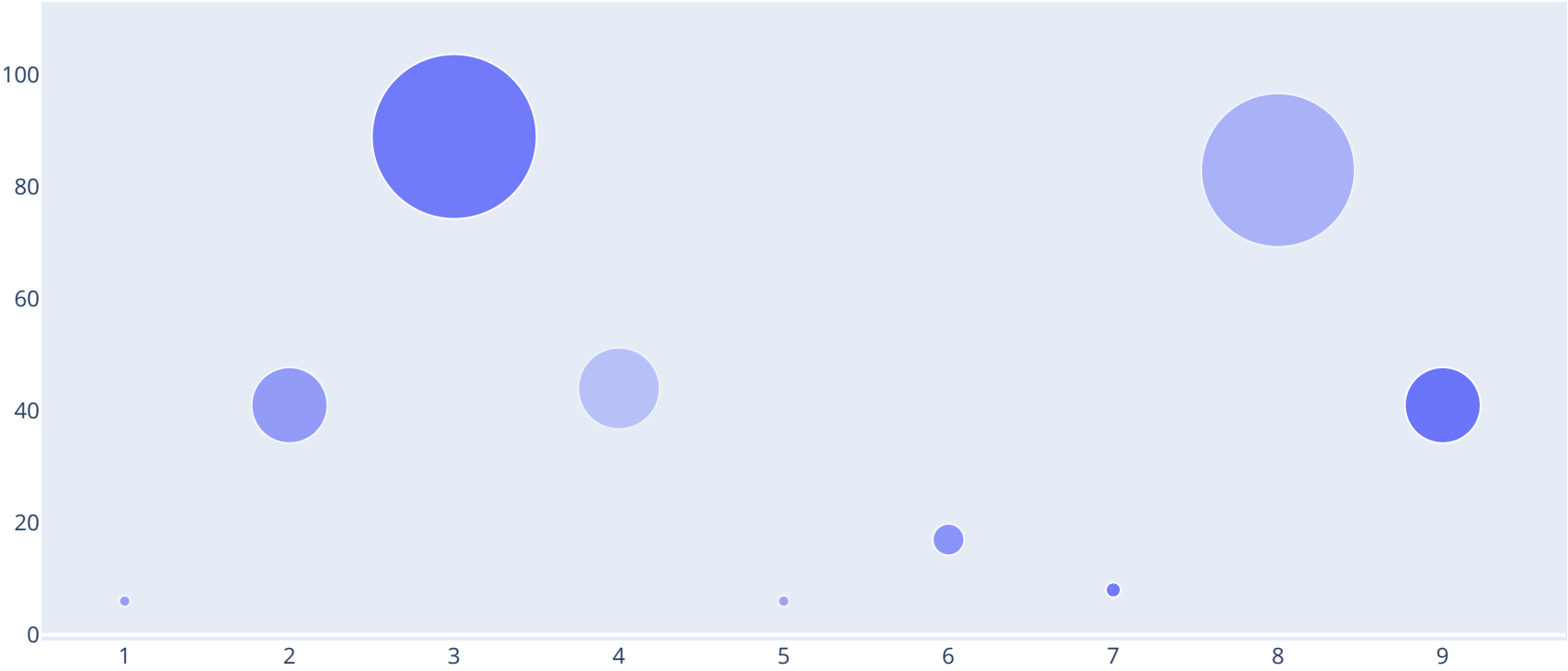


```
In [102]: x = np.arange(1,10)
y = np.random.randint(1,100,9)
op = np.random.uniform(0.2,1 ,9)
data = go.Scatter(
    x = x,
    y = y,
    mode = 'markers',
    marker = dict(size = y,opacity = op), # Changing opacity & size of bubbles
)

fig = go.Figure(data=data)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

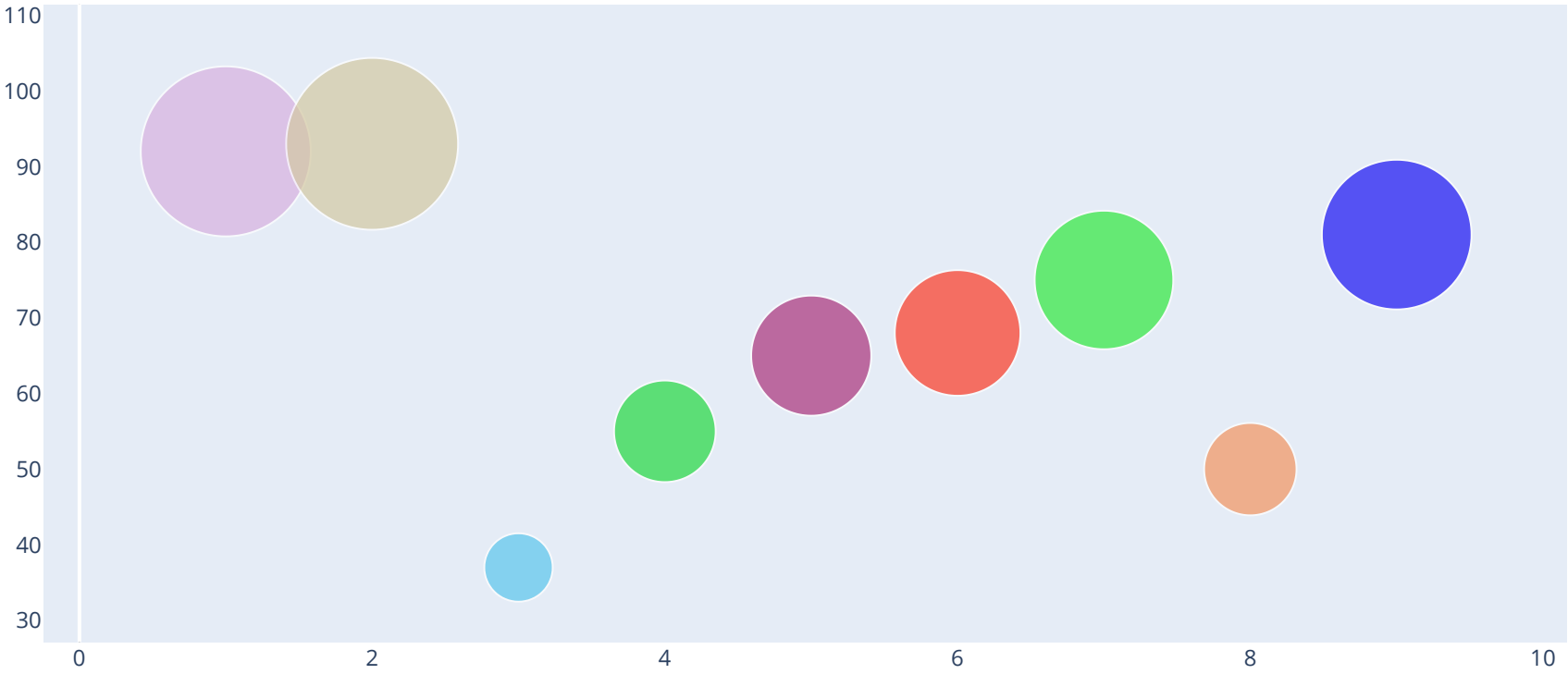



```
In [104]: x = np.arange(1,10)
y = np.random.randint(1,100,9)
op = np.random.uniform(0.2,1 ,9)
hexval = [hex(x) for x in np.random.randint(0,16777215,10)]
hexval = ['#' + hexval[i][2:] for i in range(0,10)] #Generate Hex color List
data = go.Scatter(
    x = x,
    y = y,
    mode = 'markers',
    marker = dict(size = y,color = hexval) # Changing color & size of bubbles
)

fig = go.Figure(data=data)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```



```
In [105]: suicide.head()
```

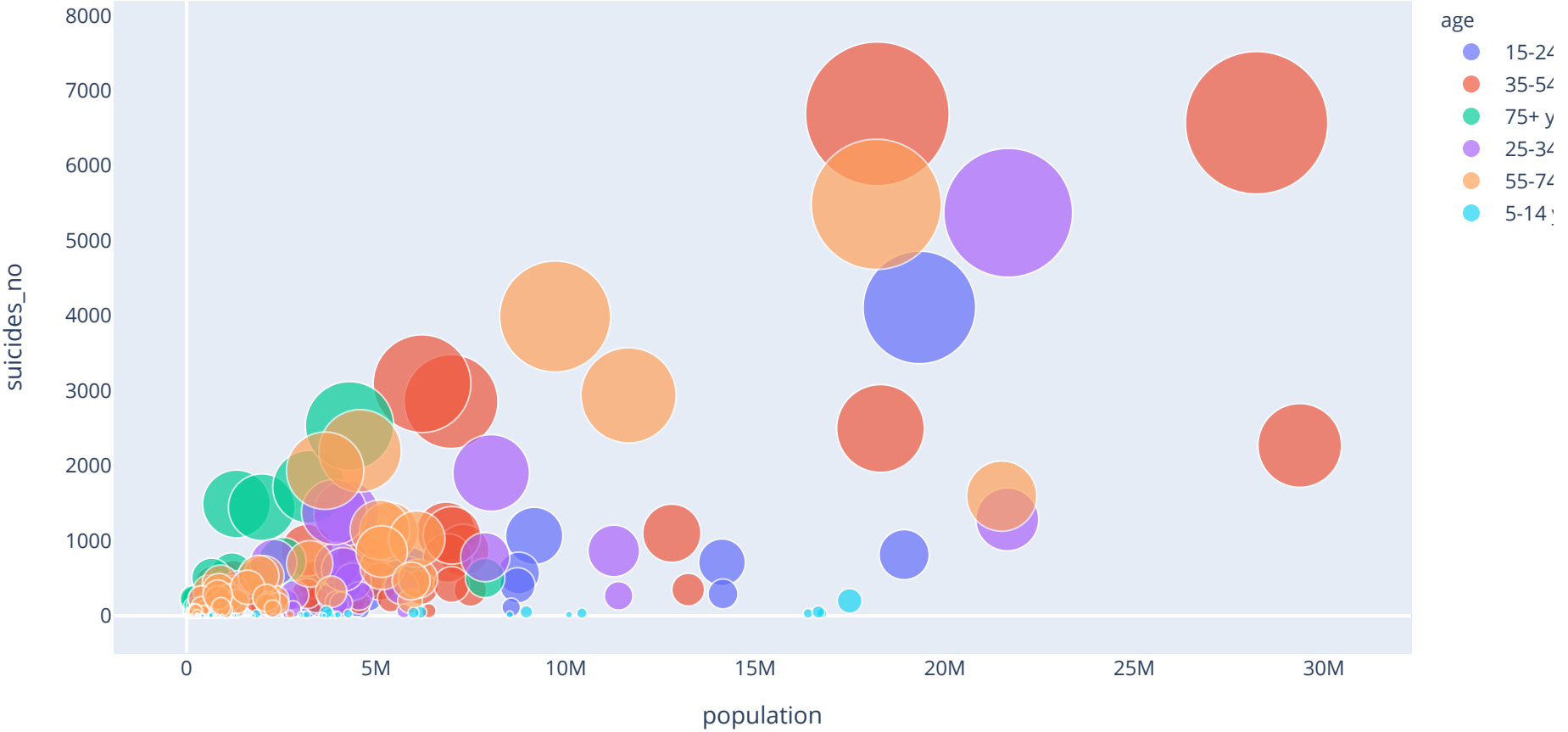
Out[105]:

	country	year	sex	age	suicides_no	population	suicides/100k pop	country-year	HDI for year	gdp_for_year (\$)	gdp_per_capita (\$)	generation
0	Albania	1987	male	15-24 years	21	312900	6.71	Albania1987	NaN	2,156,624,900	796	Generation X
1	Albania	1987	male	35-54 years	16	308000	5.19	Albania1987	NaN	2,156,624,900	796	Silent
2	Albania	1987	female	15-24 years	14	289700	4.83	Albania1987	NaN	2,156,624,900	796	Generation X
3	Albania	1987	male	75+ years	1	21800	4.59	Albania1987	NaN	2,156,624,900	796	G.I. Generation
4	Albania	1987	male	25-34 years	9	274300	3.28	Albania1987	NaN	2,156,624,900	796	Boomers

```
In [106]: # Bubble Chart using plotly.express
fig = px.scatter(
    suicide.query("year==1987"),
    x="population",
    y="suicides_no",
    size="suicides_no",
    color="age",
    hover_name="country",
    size_max=60
)

# Hide grid lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```



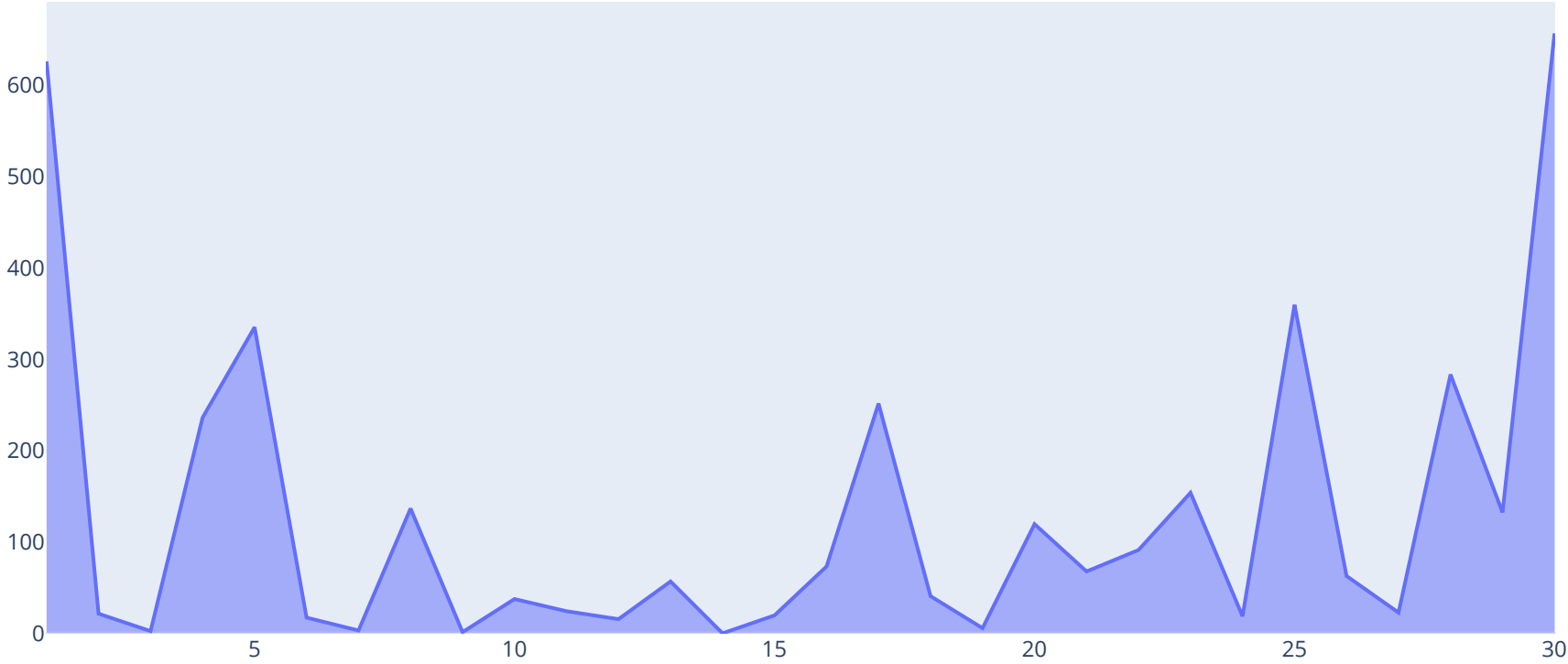
Area Plot

In [108]:

```
# Simple Area plot
x = np.arange(1,31)
y = np.random.normal(10,11,size=30)
y = np.square(y)
fig = go.Figure()
fig.add_trace(go.Scatter(x=x, y=y, fill='tozeroy')) # fill down to xaxis

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

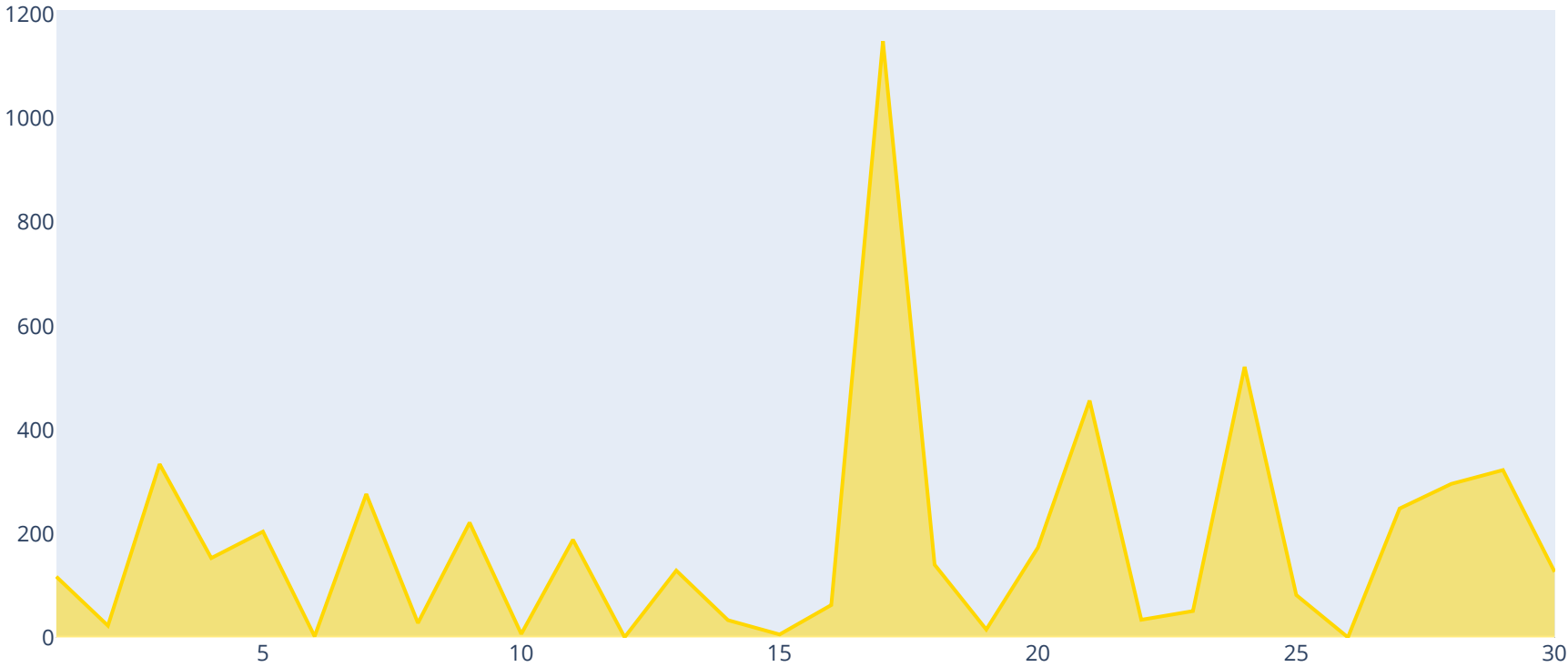


In [110]:

```
#Changing color of area plot using marker color
x = np.arange(1,31)
y = np.random.normal(10,11,size=30)
y = np.square(y)
fig = go.Figure()
fig.add_trace(go.Scatter(x=x, y=y, fill='tozeroy',marker = dict(color = 'gold')))) # fill down to xaxis

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

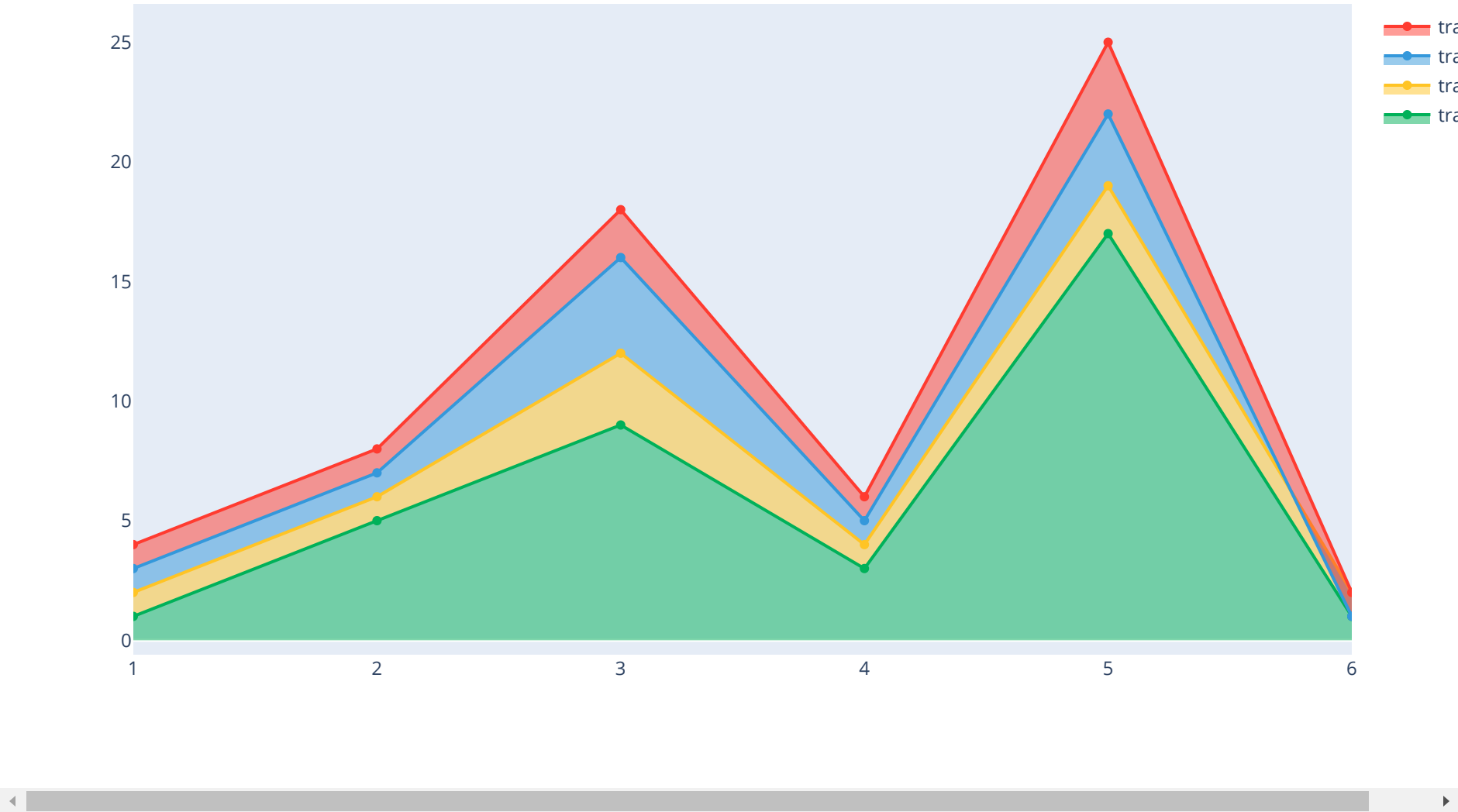


```
In [111]: x=np.arange(1,7)
y1 = np.array([1,5,9,3,17,1])
y2 = np.array([2,6,12,4,19,2])
y3 = np.array([3,7,16,5,22,1])
y4 = np.array([4,8,18,6,25,2])

fig = go.Figure()
fig.add_trace(go.Scatter(x=x, y=y1, fill='tozeroy',marker = dict(color = '#00b159')))) # fill down to xaxis
fig.add_trace(go.Scatter(x=x, y=y2, fill='tonexty',marker = dict(color = '#ffc425')))) # fill to trace0 y
fig.add_trace(go.Scatter(x=x, y=y3, fill='tonexty',marker = dict(color = '#3498DB')))) # fill to trace1 y
fig.add_trace(go.Scatter(x=x, y=y4, fill='tonexty',marker = dict(color = '#ff3b30')))) # fill to trace2 y
fig.update_layout(width = 980 , height = 600)

# Hide grid lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```



In [112]:

```
#Stacked Area Chart(Using stackgroup parameter)

x=np.arange(1,7)
y1 = np.array([1,5,9,3,17,1])
y2 = np.array([2,6,12,4,19,2])
y3 = np.array([3,7,16,5,22,1])
y4 = np.array([4,8,18,6,25,2])

fig = go.Figure()
fig.add_trace(go.Scatter(
    x=x,
    y=y1,
    marker = dict(color = '#00b159'),
    stackgroup='one' # The stackgroup parameter is used to create a Stacked Area Chart
))

fig.add_trace(go.Scatter(
    x=x,
    y=y2,
    marker = dict(color = '#ffc425'),
    stackgroup='one'
))

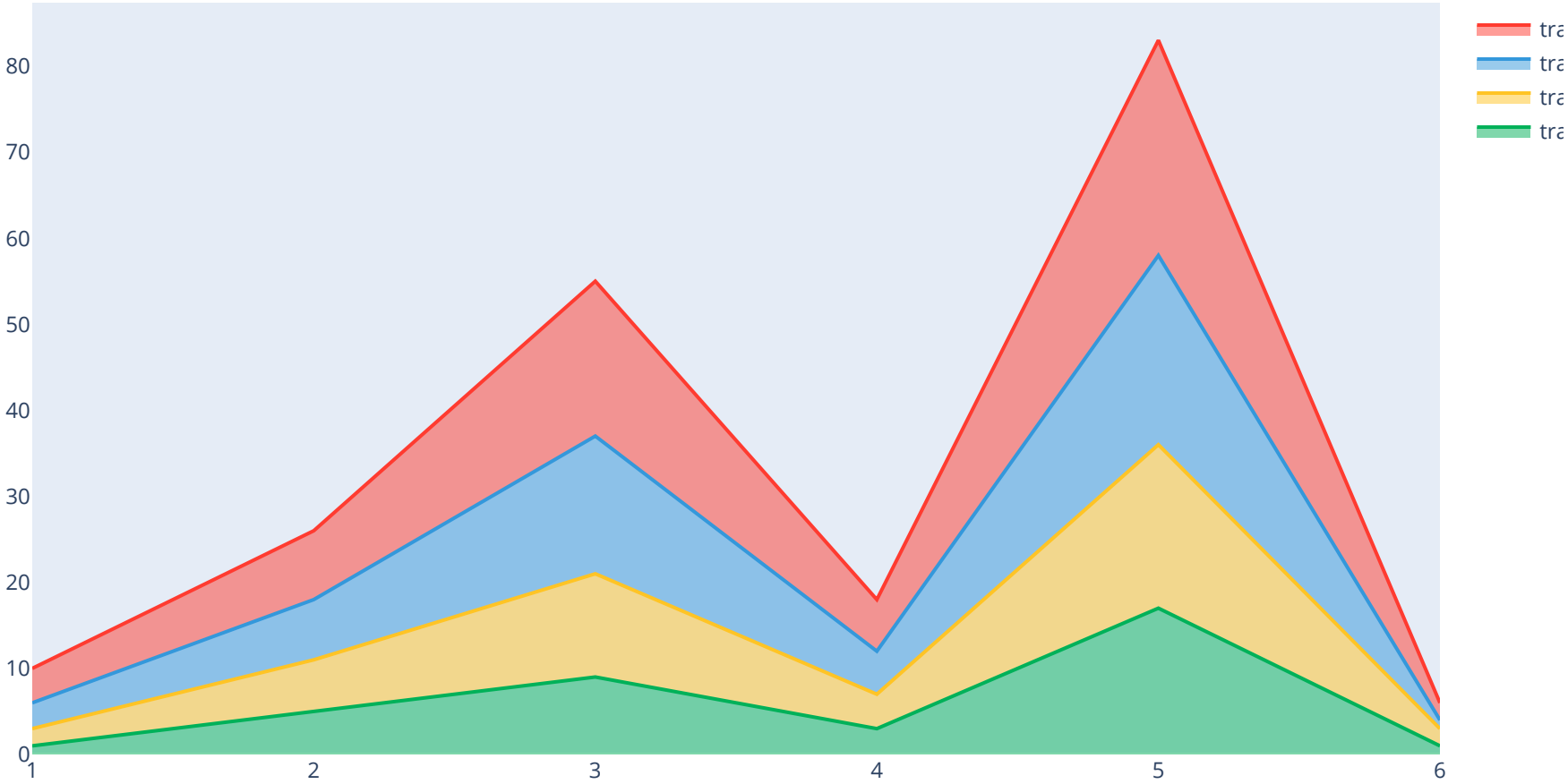
fig.add_trace(go.Scatter(
    x=x,
    y=y3,
    marker = dict(color = '#3498DB'),
    stackgroup='one'
))

fig.add_trace(go.Scatter(
    x=x,
    y=y4,
    marker = dict(color = '#ff3b30'),
    stackgroup='one'
))

fig.update_layout(width = 980 , height = 600)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```



In [113]:

```
#Stacked Area Chart

x=['A','B','C','D','E']
y1 = np.array([30,10,40,20,60])
y2 = np.array([10,20,10,20,10])
y3 = np.array([5,10,5,10,5])
y4 = np.array([10,5,10,5,10])

fig = go.Figure()
fig.add_trace(go.Scatter(
    x=x,
    y=y1,
    marker = dict(color = '#00b159'), # Color of trace0
    stackgroup='one' # The stackgroup parameter is used to create a Stacked Area Chart
))

fig.add_trace(go.Scatter(
    x=x,
    y=y2,
    marker = dict(color = '#ffc425'),
    stackgroup='one'
))

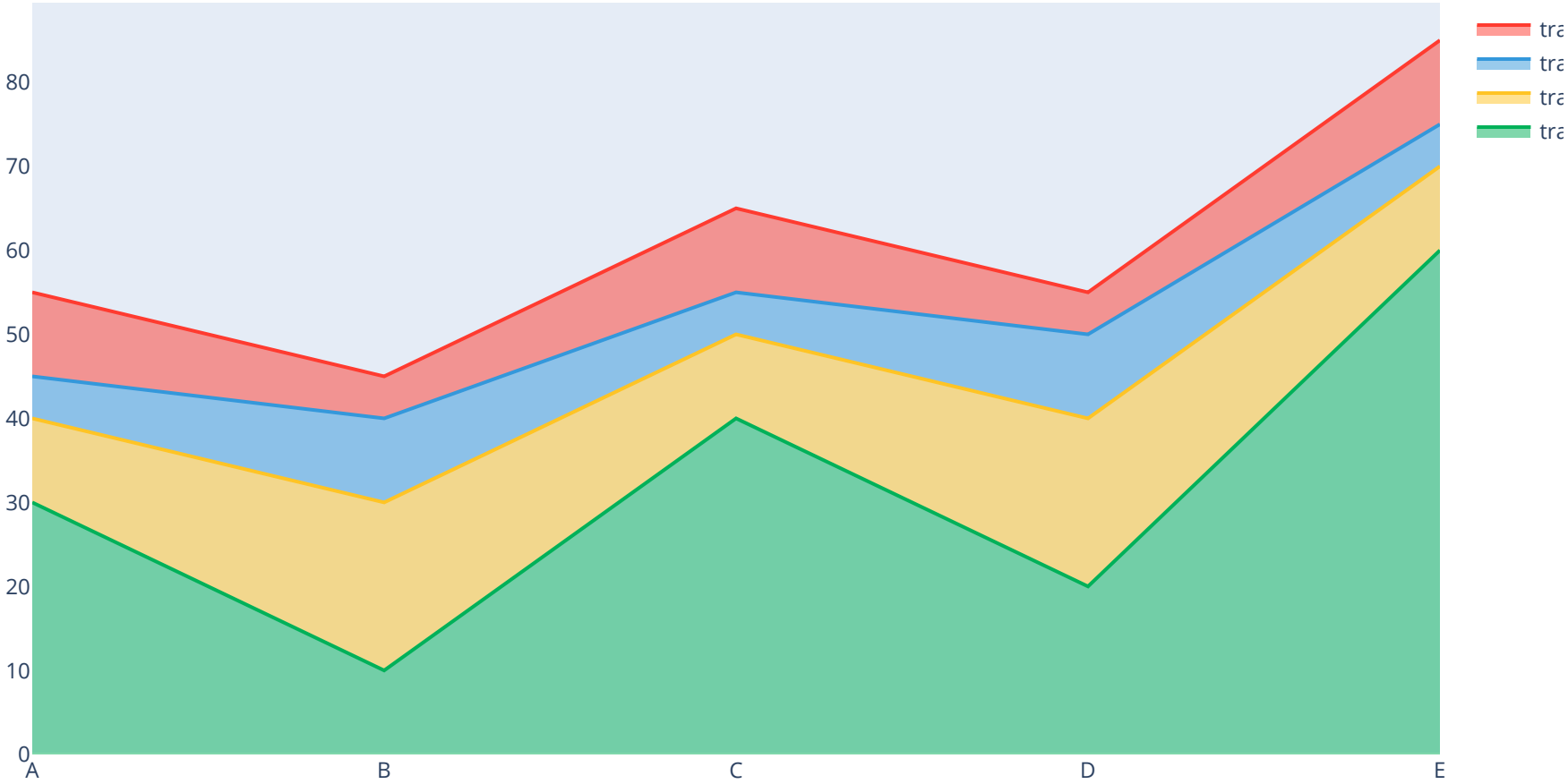
fig.add_trace(go.Scatter(
    x=x,
    y=y3,
    marker = dict(color = '#3498DB'),
    stackgroup='one'
))

fig.add_trace(go.Scatter(
    x=x,
    y=y4,
    marker = dict(color = '#ff3b30'),
    stackgroup='one'
))

fig.update_layout(width = 980 , height = 600)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```



In [114]: *#Stacked Area Chart Without Boundary Lines (Using mode= 'none')*

```
x=['A','B','C','D','E']
y1 = np.array([30,10,40,20,60])
y2 = np.array([10,20,10,20,10])
y3 = np.array([5,10,5,10,5])
y4 = np.array([10,5,10,5,10])

fig = go.Figure()
fig.add_trace(go.Scatter(
    x=x,
    y=y1,
    mode='none',
    stackgroup='one'
))

fig.add_trace(go.Scatter(
    x=x,
    y=y2,
    mode='none',
    stackgroup='one'
))

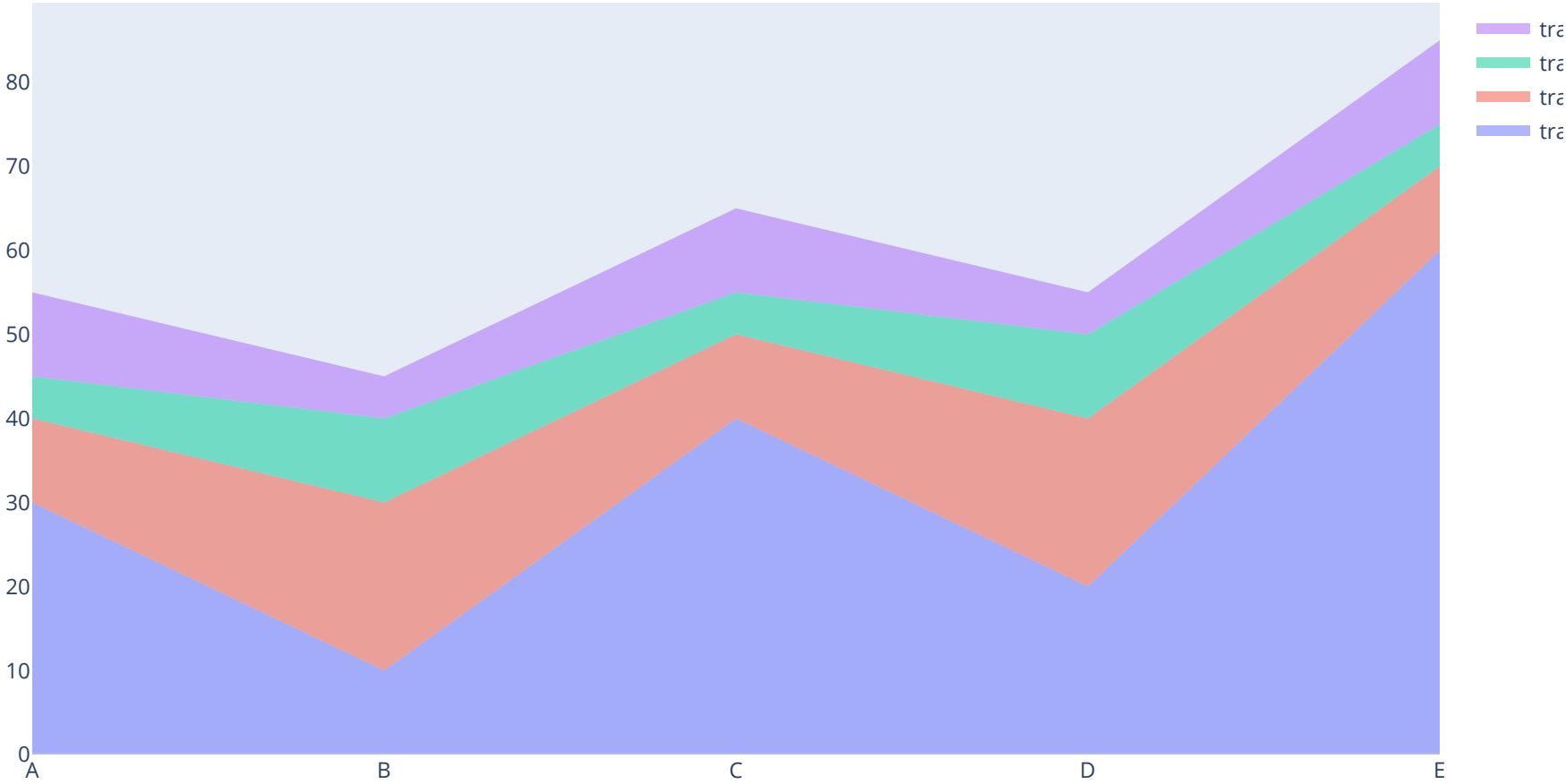
fig.add_trace(go.Scatter(
    x=x,
    y=y3,
    mode='none',
    stackgroup='one'
))

fig.add_trace(go.Scatter(
    x=x,
    y=y4,
    mode='none',
    stackgroup='one'
))

fig.update_layout(width = 980 , height = 600)

# Hide grid lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```



In [115]: #100 Percent Stacked Area Chart (Using groupnorm parameter)

```
x=['A','B','C','D','E']
y1 = np.array([30,10,40,20,60])
y2 = np.array([10,20,10,20,10])
y3 = np.array([5,10,5,10,5])
y4 = np.array([10,5,10,5,10])

fig = go.Figure()
fig.add_trace(go.Scatter(
    x=x,
    y=y1,
    marker = dict(color = '#00b159'),
    stackgroup='one',
    groupnorm='percent' #normalization for the sum of the stackgroup
))

fig.add_trace(go.Scatter(
    x=x,
    y=y2,
    marker = dict(color = '#ffc425'),
    stackgroup='one',
    groupnorm='percent'
))

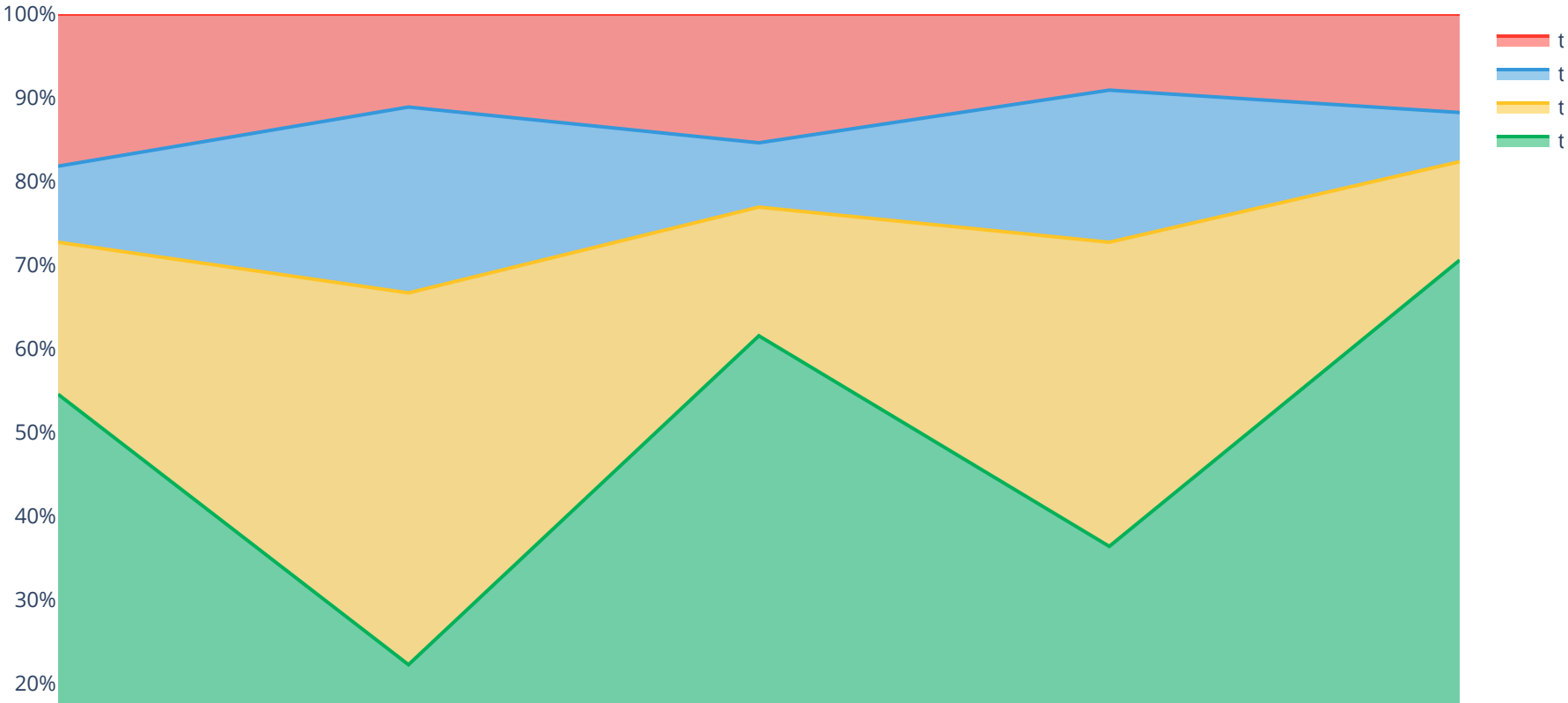
fig.add_trace(go.Scatter(
    x=x,
    y=y3,
    marker = dict(color = '#3498DB'),
    stackgroup='one',
    groupnorm='percent'
))

fig.add_trace(go.Scatter(
    x=x,
    y=y4,
    marker = dict(color = '#ff3b30'),
    stackgroup='one',
    groupnorm='percent'
))

fig.update_layout(
    width = 990,
    height = 650,
    xaxis_type='category',
    yaxis=dict(
        range=[1, 100],
        ticksuffix='%'
    )
)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```





▼

Tables & Figure Factory Tables

In [117]: rating

Out[117]:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Python	428	111	70	101	80	790	54.18	14.05	8.86	12.78	10.13
Java	370	222	80	104	70	846	43.74	26.24	9.46	12.29	8.27
Julia	298	121	90	102	60	671	44.41	18.03	13.41	15.20	8.94
C++	310	141	100	109	56	716	43.30	19.69	13.97	15.22	7.82
C	400	121	110	107	78	816	49.02	14.83	13.48	13.11	9.56

```
In [118]: #Basic table in Plotly

fig = go.Figure(data=[go.Table(
    header=dict(
        values=list(rating.columns),
    ),
    cells=dict(values=[
        rating['Strongly Agree'] ,
        rating['Agree'] ,
        rating['Neutral'] ,
        rating['Disagree'] ,
        rating['Strongly Disagree'],
        rating['Total'],
        rating['Strongly Agree (%)'],
        rating['Agree (%)'],
        rating['Neutral (%)'],
        rating['Disagree (%)'],
        rating['Strongly Disagree (%)']
    ],
    )
])

fig.show()
```

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
428	111	70	101	80	790	54.18	14.05	8.86	12.78	10.13
370	222	80	104	70	846	43.74	26.24	9.46	12.29	8.27
298	121	90	102	60	671	44.41	18.03	13.41	15.2	8.94
310	141	100	109	56	716	43.3	19.69	13.97	15.22	7.82
400	121	110	107	78	816	49.02	14.83	13.48	13.11	9.56

In [119]:

```
# Styled Table in Plotly
fig = go.Figure(data=[go.Table(
    header=dict(
        values=list(rating.columns),
        fill_color='paleturquoise',
        align='left'
    ),
    cells=dict(values=[
        rating['Strongly Agree'] ,
        rating['Agree'] ,
        rating['Neutral'] ,
        rating['Disagree'] ,
        rating['Strongly Disagree'],
        rating['Total'],
        rating['Strongly Agree (%)'],
        rating['Agree (%)'],
        rating['Neutral (%)'],
        rating['Disagree (%)'],
        rating['Strongly Disagree (%)']
    ],
        fill_color='lavender',
        align='center'))
])
fig.update_layout(width=990, height=350)
fig.show()
```

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
428	111	70	101	80	790	54.18	14.05	8.86	12.78	10.13
370	222	80	104	70	846	43.74	26.24	9.46	12.29	8.27
298	121	90	102	60	671	44.41	18.03	13.41	15.2	8.94
310	141	100	109	56	716	43.3	19.69	13.97	15.22	7.82
400	121	110	107	78	816	49.02	14.83	13.48	13.11	9.56



```
In [120]: # Styled Table in Plotly

fig = go.Figure(data=[go.Table(
    header=dict(
        values=list(insurance.columns), # Header values
        line_color='black', # Line Color of header
        fill_color='orange', # background color of header
        align='center', # Align header at center
        height=40, # Height of Header
        font=dict(color='white', size=18), # Font size & color of header text
    ),
    cells=dict(values=[
        insurance.age , # Column values
        insurance.sex,
        insurance.bmi,
        insurance.children,
        insurance.smoker,
        insurance.region,
        insurance.charges
    ],
        line_color='darkgrey', # Line color of the cell
        fill_color='lightcyan', # Color of the cell
        align='left' # Align text to left in cell
    )
])

fig.show()
```

age	sex	bmi	children	smoker	region	charges
19	female	27.9	0	yes	southwest	16884.924
18	male	33.77	1	no	southeast	1725.5523
28	male	33	3	no	southeast	4449.462
33	male	22.705	0	no	northwest	21984.47061
32	male	28.88	0	no	northwest	3866.8552
31	female	25.74	0	no	southeast	3756.6216
46	female	33.44	1	no	southeast	8240.5896
37	female	27.74	3	no	northwest	7281.5056
37	male	29.83	2	no	northeast	6406.4107
60	female	25.84	0	no	northwest	28923.13691999999
25	male	26.22	0	no	northeast	2721.3208
62	female	26.29	0	yes	southeast	27808.7251
23	male	34.4	0	no	southwest	1826.8429999999999
56	female	39.82	0	no	southeast	11090.7178
27	male	42.13	0	yes	southeast	39611.7577

In [143]:

```
# Styled Table in Plotly

rowEvenColor = 'lightgrey'
rowOddColor = 'white'
fig = go.Figure(data=[go.Table(  columnwidth = [80,80,80,80,80,80,120,80,80,80,120],
                                header=dict(
                                    values=[
                                        '<b>Strongly Agree</b>',
                                        '<b>Agree</b>',
                                        '<b>Neutral</b>',
                                        '<b>Disagree</b>',
                                        '<b>Strongly Disagree</b>',
                                        '<b>Total</b>',
                                        '<b>Strongly Agree (%)</b>',
                                        '<b>Agree (%)</b>',
                                        '<b>Neutral (%)</b>',
                                        '<b>Disagree (%)</b>',
                                        '<b>Strongly Disagree (%)</b>'
                                    ],
                                    fill_color='#8BC34A',
                                    line = dict(color = '#689F38' , width = 4),
                                    align='center',
                                    font_size=12,
                                    font_color = 'white'
                                ),
                                cells=dict(values=[
                                    rating['Strongly Agree'] ,
                                    rating['Agree'] ,
                                    rating['Neutral'] ,
                                    rating['Disagree'] ,
                                    rating['Strongly Disagree'],
                                    rating['Total'],
                                    rating['Strongly Agree (%)'],
                                    rating['Agree (%)'],
                                    rating['Neutral (%)'],
                                    rating['Disagree (%)'],
                                    rating['Strongly Disagree (%)']
                                ],
                                    fill_color = [[rowOddColor,rowEvenColor]*5],
                                    line = dict(color = 'lightgreen' , width = 4),
                                    align = 'center',
                                    font_size=12,
                                    font = dict(color = 'darkslategray', size = 11),
                                    height=40
                                )
                            ])

fig.update_layout(width=990, height=500)
fig.show()
```

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
428	111	70	101	80	790	54.18	14.05	8.86	12.78	10.13
370	222	80	104	70	846	43.74	26.24	9.46	12.29	8.27
298	121	90	102	60	671	44.41	18.03	13.41	15.2	8.94
310	141	100	109	56	716	43.3	19.69	13.97	15.22	7.82
400	121	110	107	78	816	49.02	14.83	13.48	13.11	9.56

In [31]:

```
# Create simple table using create_table function

fig = ff.create_table(insurance.tail(5))
fig.show()
```

age	sex	bmi	children	smoker	region	charges
50	male	30.97	3	no	northwest	10600.5483
18	female	31.92	0	no	northeast	2205.9808
18	female	36.85	0	no	southeast	1629.8335
21	female	25.8	0	no	southwest	2007.945
61	female	29.07	0	yes	northwest	29141.3603

In [266]:

```
# Create simple table using create_table function

fig = ff.create_table(insurance.tail(5),height_constant=50)
fig.show()
```

age	sex	bmi	children	smoker	region	charges
50	male	30.97	3	no	northwest	10600.5483
18	female	31.92	0	no	northeast	2205.9808
18	female	36.85	0	no	southeast	1629.8335
21	female	25.8	0	no	southwest	2007.945
61	female	29.07	0	yes	northwest	29141.3603

In [47]:

```
# Using color scales in table

colorscale = [[0, 'red'],[.5, '#DCE775'],[1, '#C0CA33']]
fig = ff.create_table(insurance.tail(5),height_constant=50,colorscale=colorscale)
fig.show()
```

age	sex	bmi	children	smoker	region	charges
50	male	30.97	3	no	northwest	10600.5483
18	female	31.92	0	no	northeast	2205.9808
18	female	36.85	0	no	southeast	1629.8335
21	female	25.8	0	no	southwest	2007.945
61	female	29.07	0	yes	northwest	29141.3603

In [50]:

```
# Changing font color

colorscale = [[0, 'red'], [.5, '#DCE775'], [1, '#C0CA33']]
font=['white', '#212121' , 'red']
fig = ff.create_table(insurance.tail(5),height_constant=50,colorscale=colorscale,font_colors=font)
fig.show()
```

age	sex	bmi	children	smoker	region	charges
50	male	30.97	3	no	northwest	10600.5483
18	female	31.92	0	no	northeast	2205.9808
18	female	36.85	0	no	southeast	1629.8335
21	female	25.8	0	no	southwest	2007.945
61	female	29.07	0	yes	northwest	29141.3603

In [269]:

```
# Changing font size using "fig.layout.annotations[i].font.size"

colorscale = [[0, 'red'], [.5, '#DCE775'], [1, '#C0CA33']]
font=['white', '#212121' , 'red']
fig = ff.create_table(insurance.tail(5),height_constant=50,colorscale=colorscale,font_colors=font)
for i in range(len(fig.layout.annotations)):
    fig.layout.annotations[i].font.size = 17
fig.show()
```

age	sex	bmi	children	smoker	region	charges
50	male	30.97	3	no	northwest	10600.5483
18	female	31.92	0	no	northeast	2205.9808
18	female	36.85	0	no	southeast	1629.8335
21	female	25.8	0	no	southwest	2007.945
61	female	29.07	0	yes	northwest	29141.3603

In [44]:

```
colorscale = [[0, 'red'], [.5, '#DCE775'], [1, '#C0CA33']]
font=['white', '#212121' , 'red']
fig = ff.create_table(insurance.tail(5),height_constant=50,colorscale=colorscale,font_colors=font)
for i in range(len(fig.layout.annotations)):
    fig.layout.annotations[i].font.size = 12
fig.show()
```

age	sex	bmi	children	smoker	region	charges
50	male	30.97	3	no	northwest	10600.5483
18	female	31.92	0	no	northeast	2205.9808
18	female	36.85	0	no	southeast	1629.8335
21	female	25.8	0	no	southwest	2007.945
61	female	29.07	0	yes	northwest	29141.3603

```
In [52]: canada.loc[:, ['India', 'Pakistan', 'China']].head(6)
```

Out[52]:

	India	Pakistan	China
1980	8880	978	5123
1981	8670	972	6682
1982	8147	1201	3308
1983	7338	900	1863
1984	5704	668	1527
1985	4211	514	1816

In [121]:

```
# Displaying tables along with graphs

import plotly.graph_objs as go
import plotly.figure_factory as ff

# Add table data
table_data = canada.loc[:, ['India','Pakistan','China']].head(6)

# Initialize a figure with ff.create_table(table_data)
fig = ff.create_table(table_data, height_constant=60)

# Make traces for graph
fig.add_trace( go.Scatter(
    x = canada.index.values,
    y = canada['China'],
    mode = 'lines',
    name = 'China',
    xaxis='x2', yaxis='y2'
))

# Make traces for graph
fig.add_trace( go.Scatter(
    x = canada.index.values,
    y = canada['India'],
    mode = 'lines',
    name = 'India',
    xaxis='x2', yaxis='y2'
))

# Make traces for graph
fig.add_trace( go.Scatter(
    x = canada.index.values,
    y = canada['Pakistan'],
    mode = 'lines',
    name = 'Pakistan',
    xaxis='x2', yaxis='y2'
))

fig.update_layout(
    title=dict(text = "Immigration Data",x=0.5,y=0.98), # Figure title along with Alignment values
    paper_bgcolor= '#dbdbdb', # Figure background
    margin = {'t':50, 'b':100},
    xaxis = {'domain': [0, .5] , 'title' : 'Migrants'},
    xaxis2 = {'domain': [0.6, 1.] , 'title' : 'Year'},
    yaxis2 = {'anchor': 'x2', 'title': 'Count'},
    width = 990,
    height = 600
)

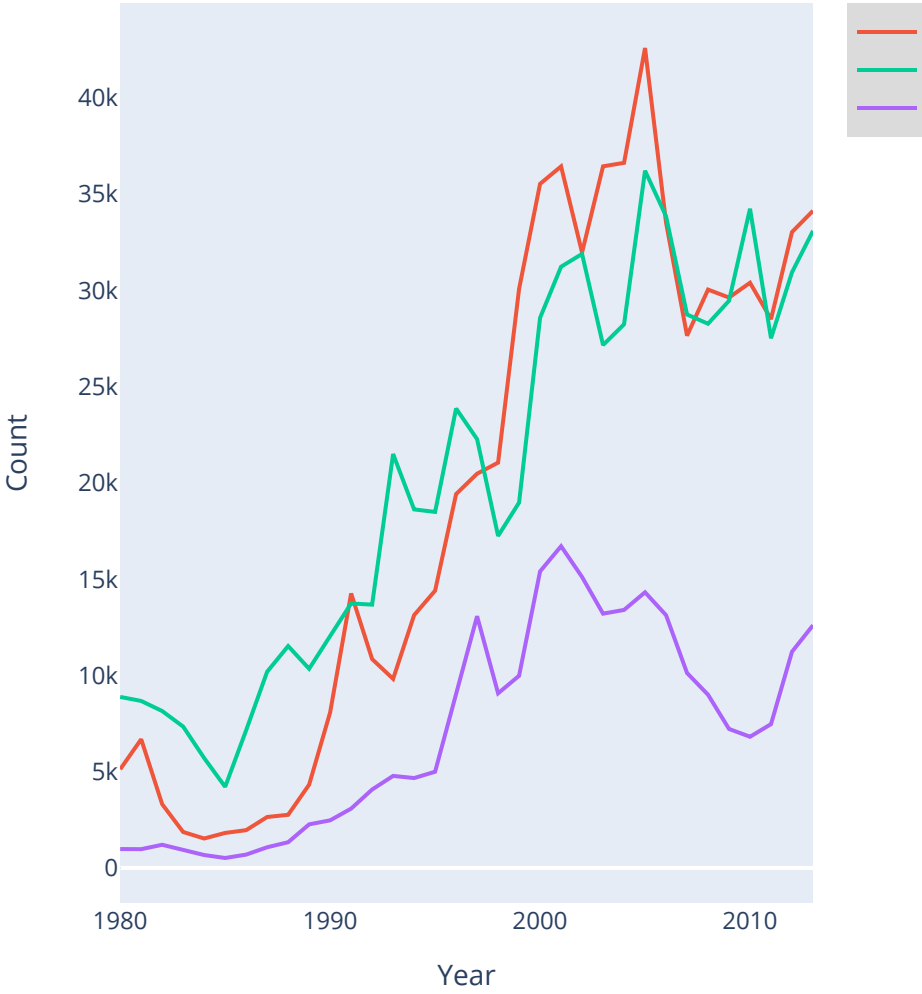
# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

Immigration Data

India	Pakistan	China
8880	978	5123
8670	972	6682
8147	1201	3308
7338	900	1863
5704	668	1527
4211	514	1816

Migrants





In [122]:

```
# Displaying tables along with graphs

import plotly.graph_objs as go
import plotly.figure_factory as ff

# Add table data
table_data = canada.loc[:, ['India','Pakistan','China' , 'Australia' , 'Germany' , 'Austria']].head(6)

# Initialize a figure with ff.create_table(table_data)
fig = ff.create_table(table_data, height_constant=60)

# Make traces for graph
fig.add_trace( go.Scatter(
    x = canada.index.values,
    y = canada['China'],
    mode = 'lines',
    name = 'China',
    xaxis='x2', yaxis='y2'
))

fig.add_trace( go.Scatter(
    x = canada.index.values,
    y = canada['India'],
    mode = 'lines',
    name = 'India',
    xaxis='x2', yaxis='y2'
))

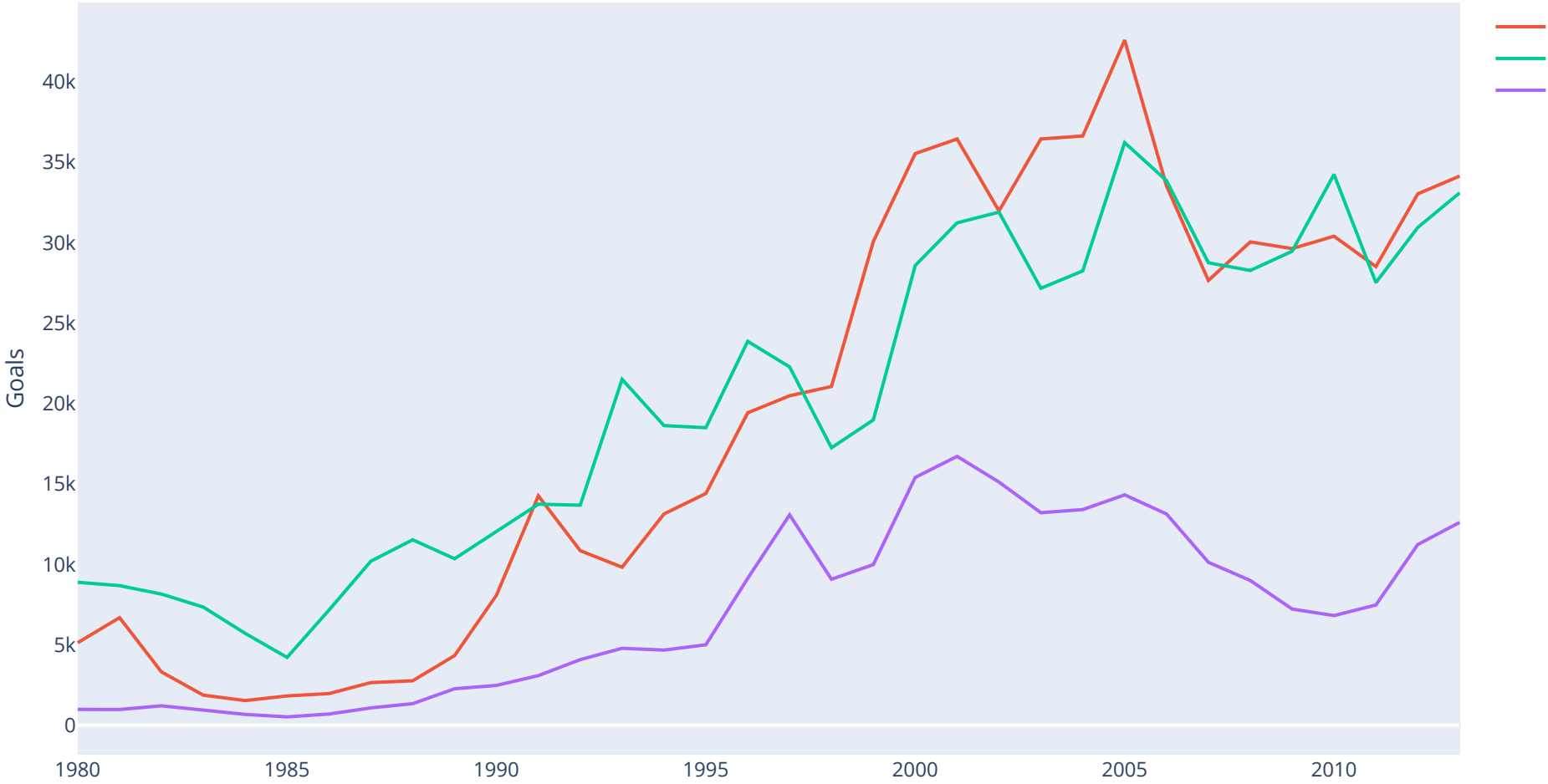
fig.add_trace( go.Scatter(
    x = canada.index.values,
    y = canada['Pakistan'],
    mode = 'lines',
    name = 'Pakistan',
    xaxis='x2', yaxis='y2'
))

fig.update_layout(
    title_text = '2016 Hockey Stats',
    height = 800,
    margin = {'t':50, 'l':20},
    yaxis = {'domain': [0, .3]},
    yaxis2 = {'domain': [.4, 1], 'anchor': 'x2', 'title': 'Goals'},
    xaxis2 = {'anchor': 'y2'},
)

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```

2016 Hockey Stats



India	Pakistan	China	Australia	Germany	Austria
8880	978	5123	702	1626	234

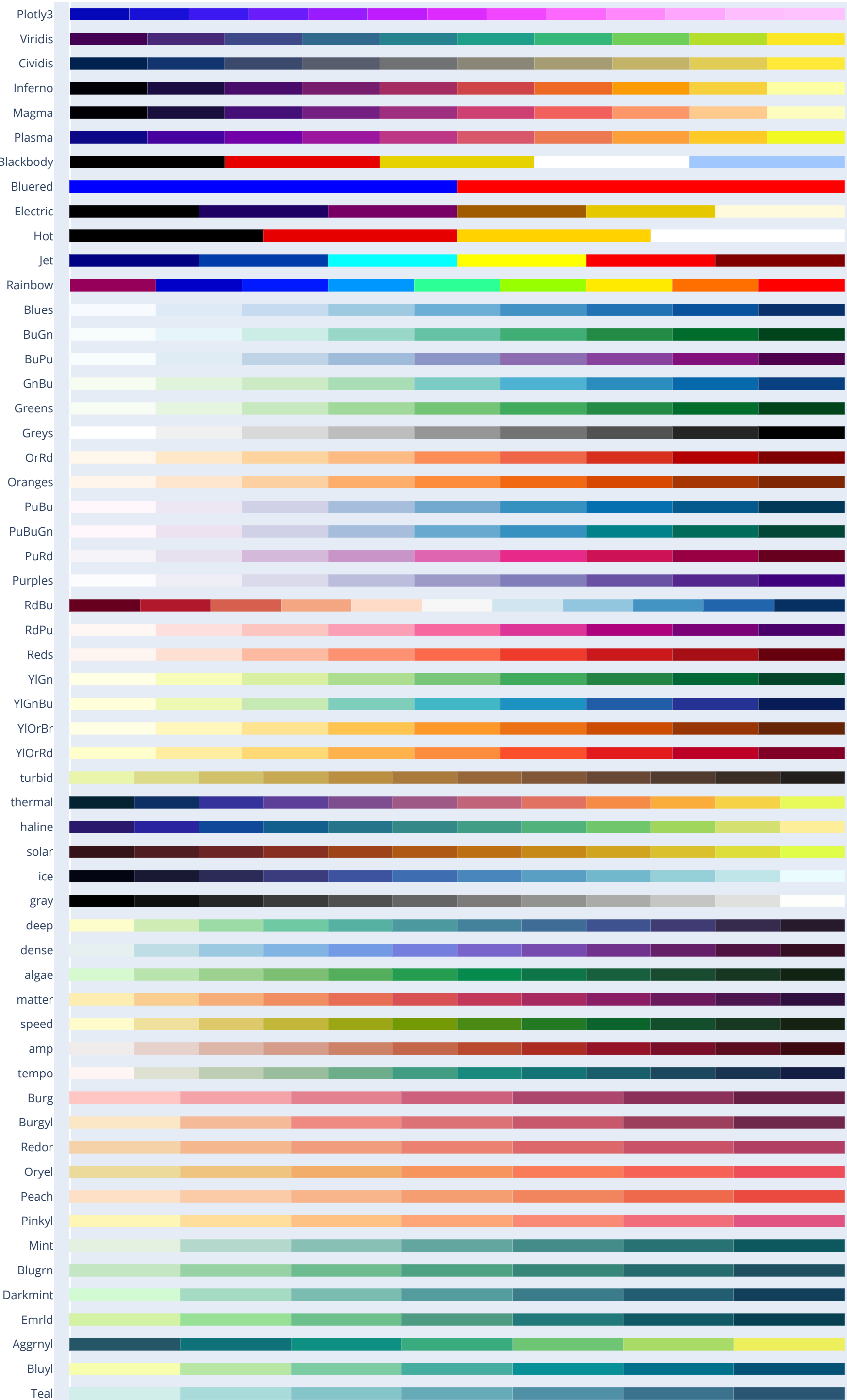
8670	972	6682	639	1977	238
8147	1201	3308	484	3062	201
7338	900	1863	317	2376	117
5704	668	1527	317	1610	127

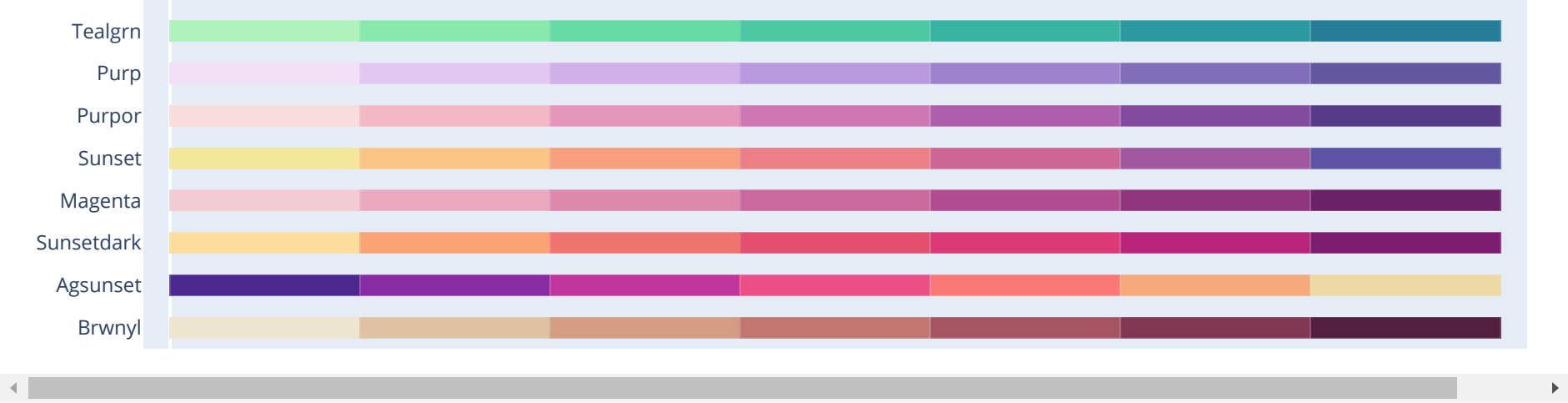


Color scales in Plotly Express

```
In [23]: #Sequential Color scales
fig = px.colors.sequential.swatches()
fig.update_layout(width = 990 , height = 1760)
fig.show()
```

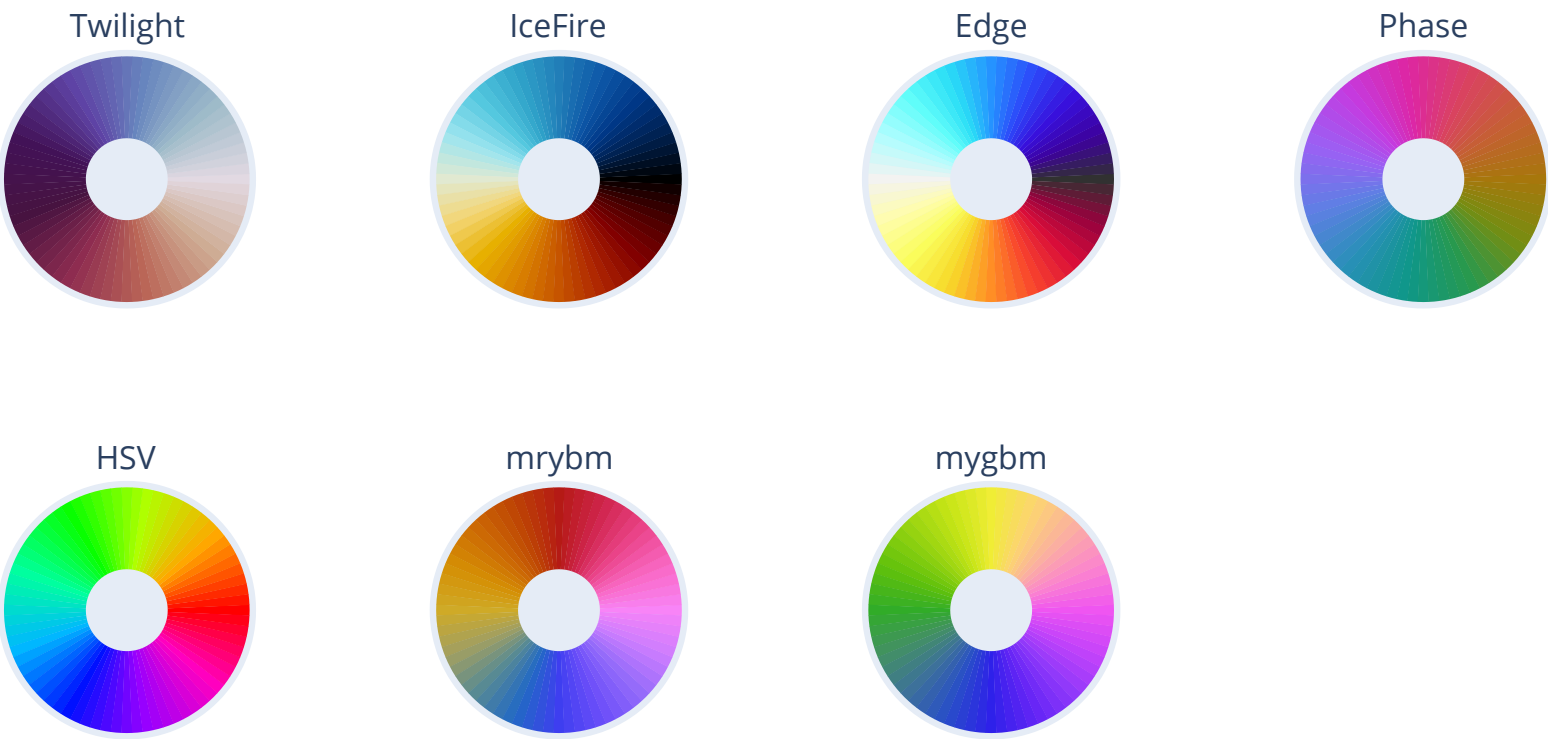
plotly.colors.sequential





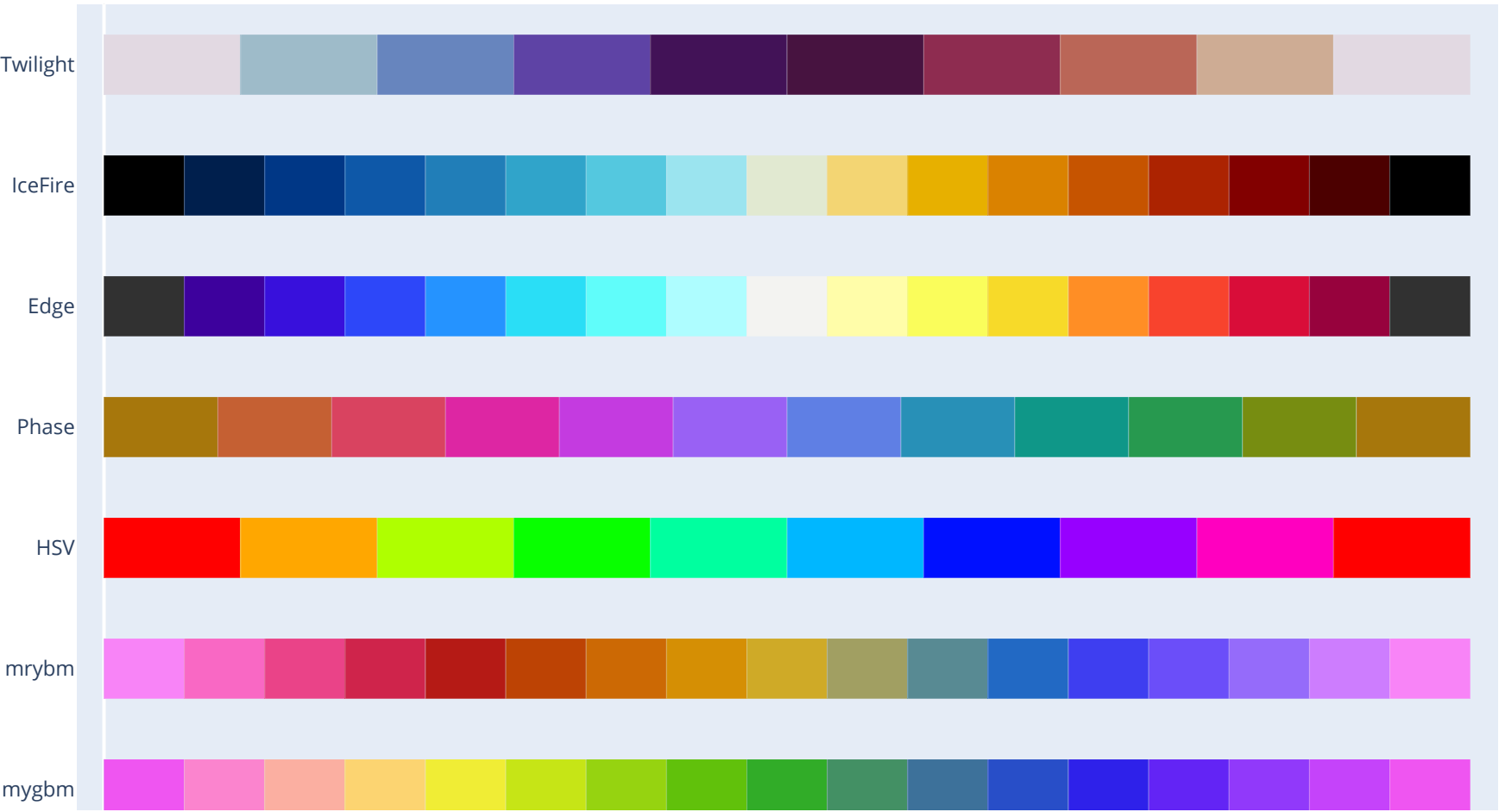
```
In [313]: #Cyclical Color scales
fig = px.colors.cyclical.swatches_cyclical()
fig.show()
```

plotly.colors.cyclical



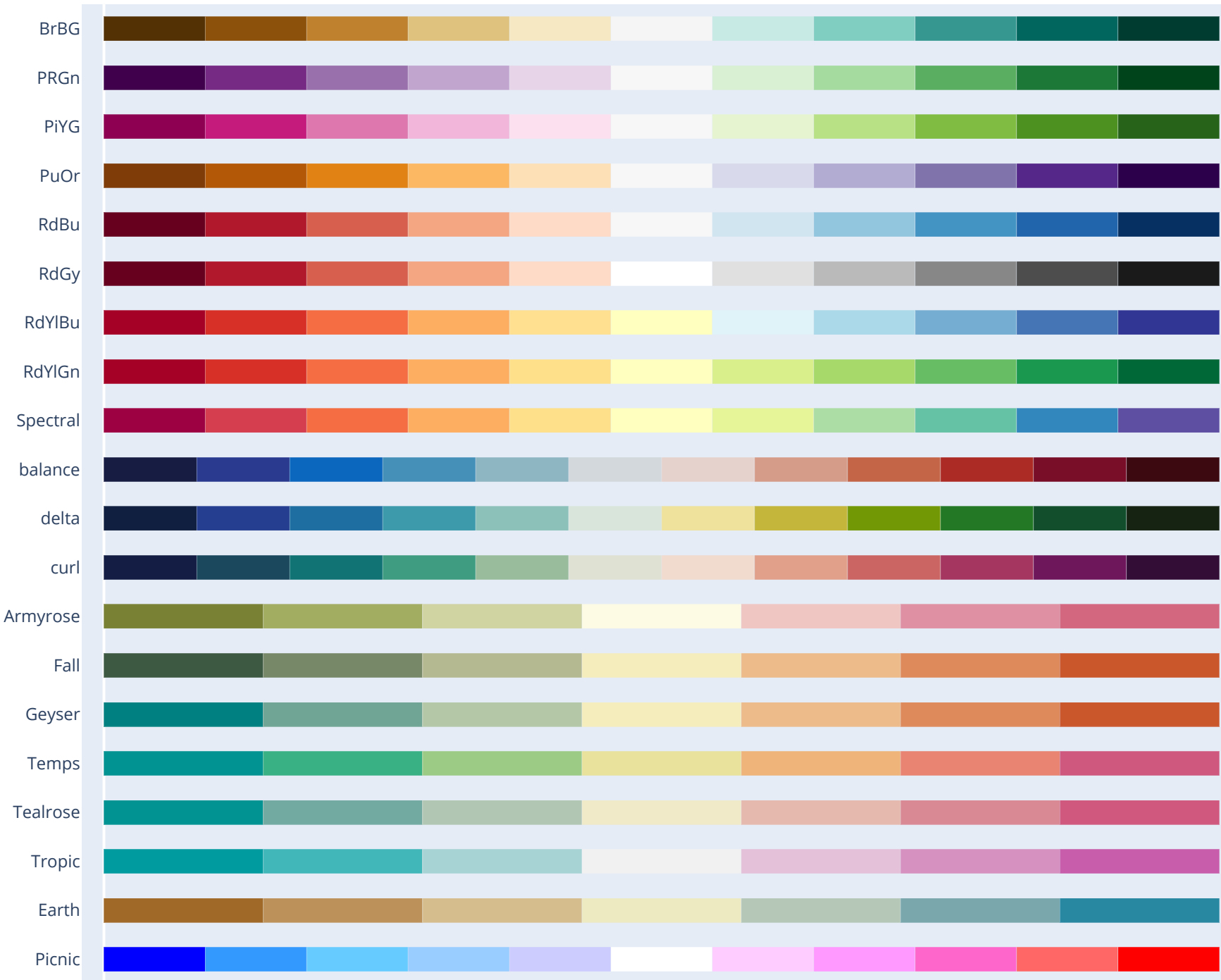
```
In [314]: #Cyclical Color scales
fig = px.colors.cyclical.swatches()
fig.show()
```

plotly.colors.cyclical



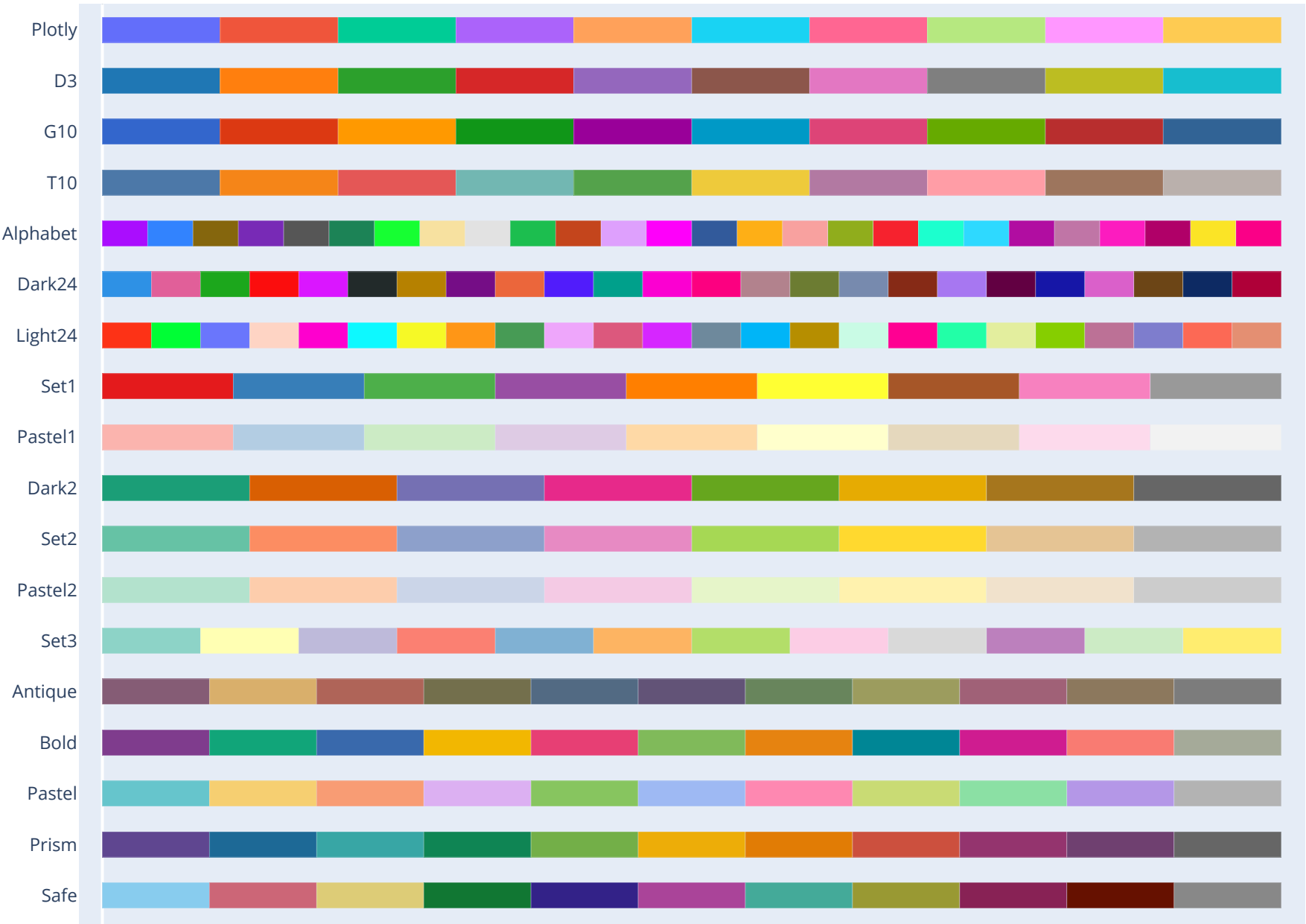
```
In [315]: #Diverging Color scales
fig = px.colors.diverging.swatches().update_layout(margin_b=10)
fig.show()
```

plotly.colors.diverging



```
In [318]: #Qualitative Color scales
fig = px.colors.qualitative.swatches()
fig.show()
```

plotly.colors.qualitative



▼ Sunburst Chart

```
In [273]: insurance = pd.read_csv('C:/Users/DELL/Documents/GitHub/Data-Visualization/insurance.csv')
insurance.head(10)
```

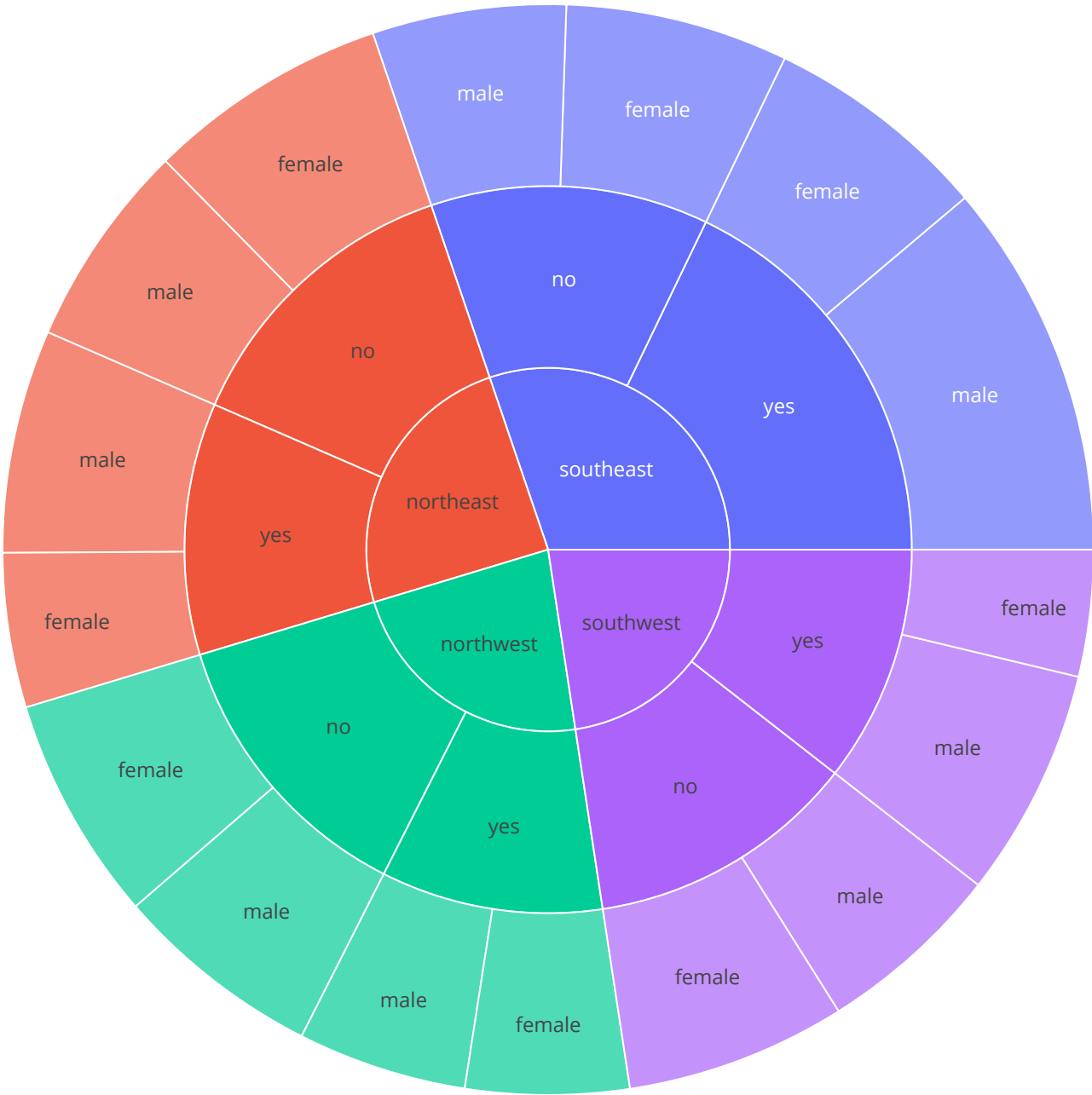
Out[273]:

	age	sex	bmi	children	smoker	region	charges
0	19	female	27.900	0	yes	southwest	16884.92400
1	18	male	33.770	1	no	southeast	1725.55230
2	28	male	33.000	3	no	southeast	4449.46200
3	33	male	22.705	0	no	northwest	21984.47061
4	32	male	28.880	0	no	northwest	3866.85520
5	31	female	25.740	0	no	southeast	3756.62160
6	46	female	33.440	1	no	southeast	8240.58960
7	37	female	27.740	3	no	northwest	7281.50560
8	37	male	29.830	2	no	northeast	6406.41070
9	60	female	25.840	0	no	northwest	28923.13692

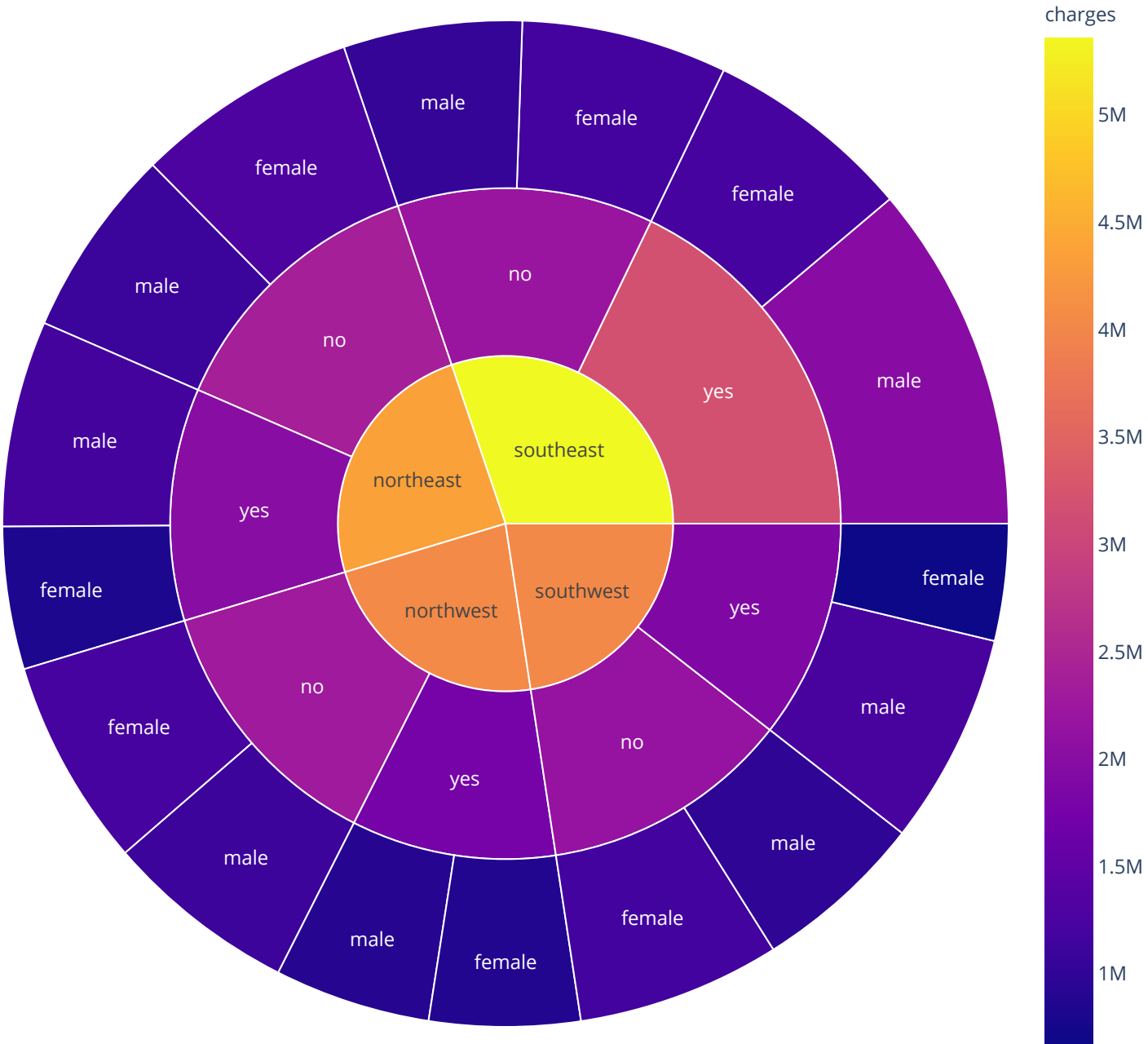
In [274]:

```
# Simple Sunburst Chart

fig = px.sunburst(insurance, path=['region', 'smoker' , 'sex'], values='charges')
fig.update_layout (height = 800 , width = 800)
fig.show()
```



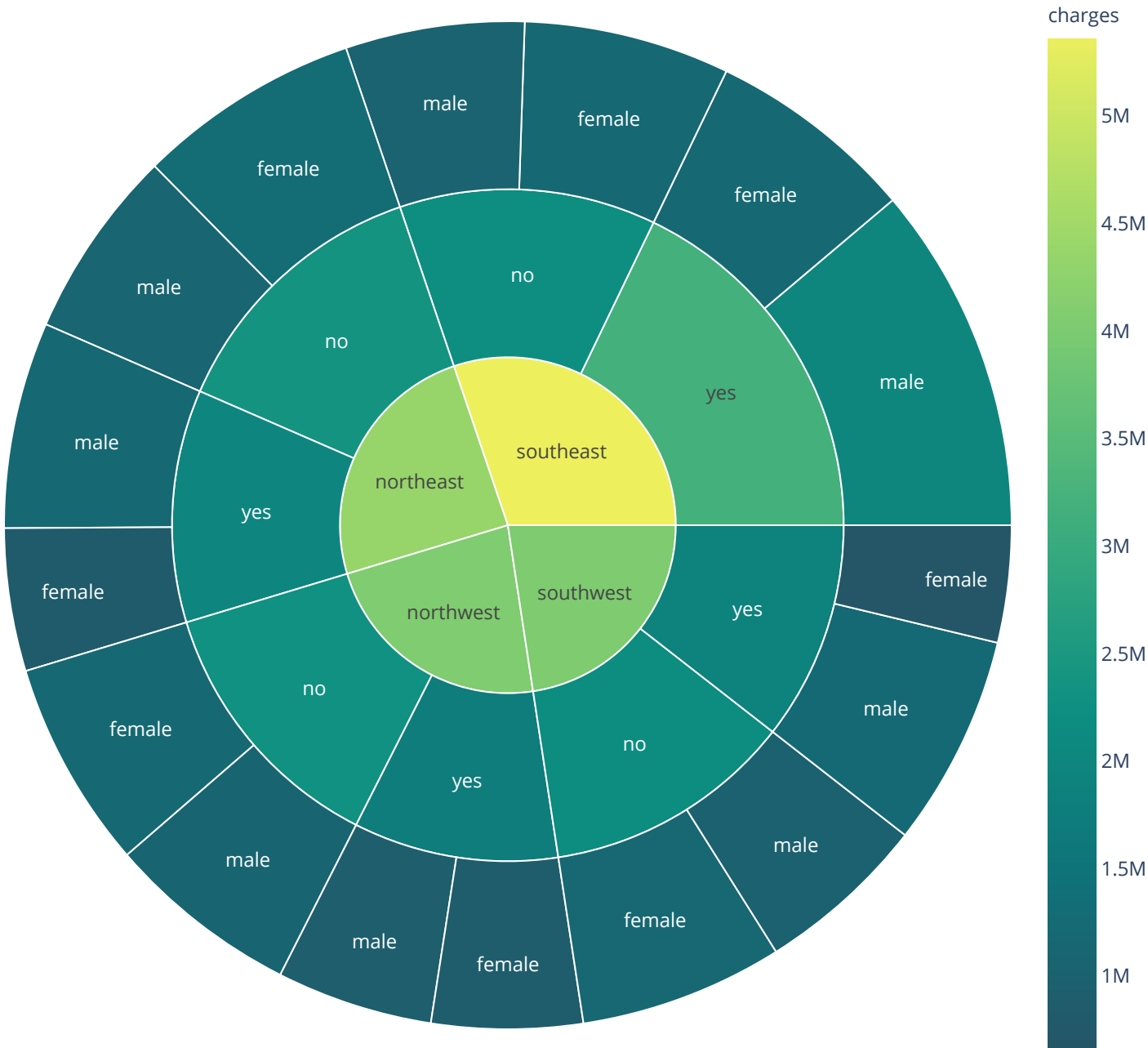
```
In [56]: fig = px.sunburst(insurance, path=['region', 'smoker', 'sex'], values='charges' , color= 'charges')
fig.update_layout (height = 800 , width = 800)
fig.show()
```



In [308]: *# Using inbuilt color scales in Sunburst Chart*

```
fig = px.sunburst(
    insurance,
    path=['region', 'smoker' , 'sex'],
    values='charges' , color= 'charges' ,
    color_continuous_scale=px.colors.sequential.Aggrnyl
)

fig.update_layout (height = 800 , width = 800)
fig.show()
```



In [295]:

```
# Using color scales in Sunburst Chart

fig = px.sunburst(
    insurance,
    path=['region', 'smoker' , 'sex'],
    values='charges' ,
    color= 'charges' ,
    color_continuous_scale=["#8BC34A", "#FF6F00"] #Explicitly Constructing a Color Sequence
)

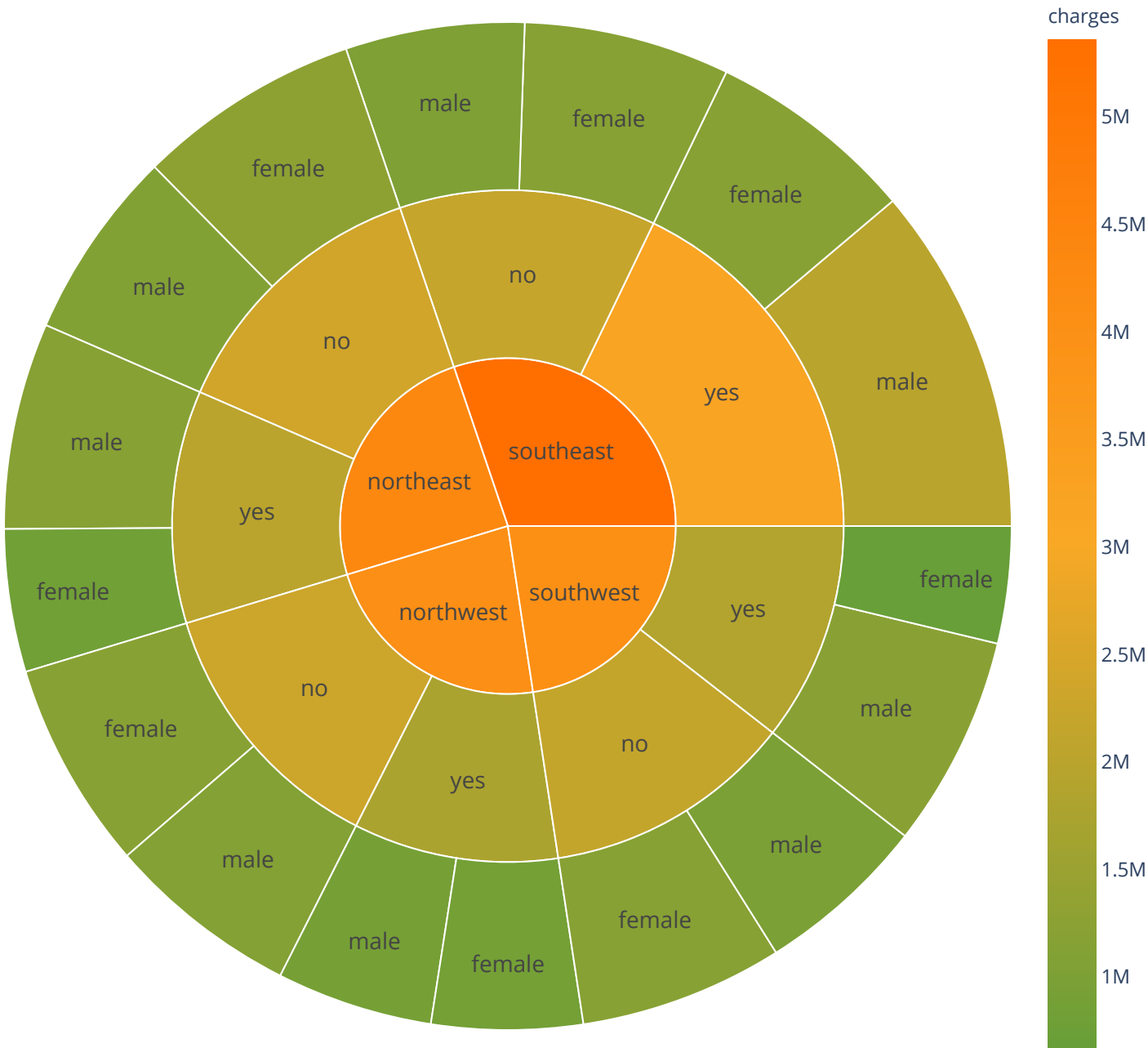
fig.update_layout (height = 800 , width = 800)
fig.show()
```



```
In [62]: # Using color scales in Sunburst Chart

fig = px.sunburst(
    insurance,
    path=['region', 'smoker' , 'sex'],
    values='charges' , color= 'charges' ,
    color_continuous_scale=["#689F38", "#F9A825", "#FF6F00"] #Explicitly Constructing a Color Sequence
)

#Controlling text fontsize with uniformtext
fig.update_layout (height = 800 , width = 800 , uniformtext=dict(minsize=14, mode='hide'))
fig.show()
```

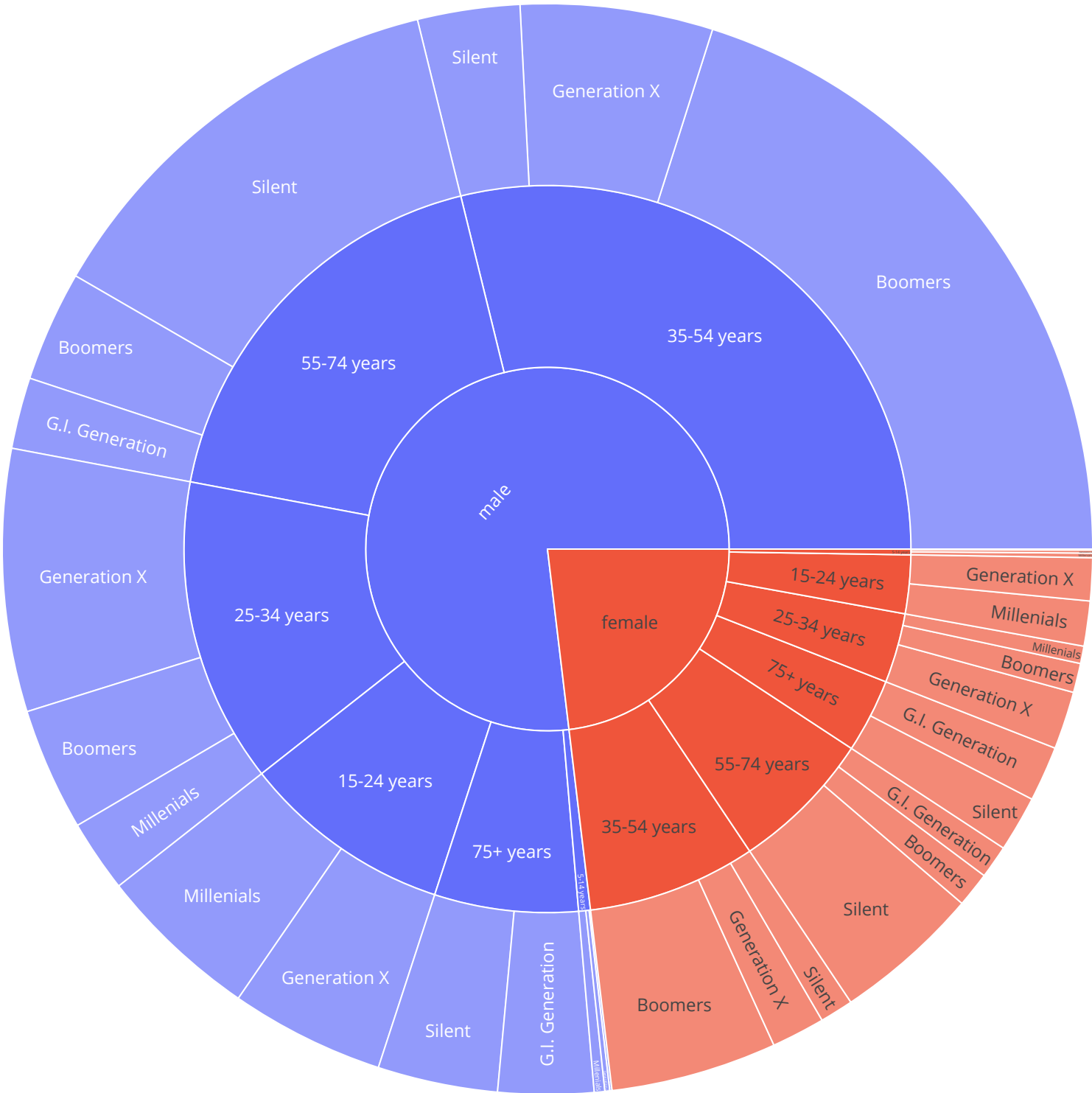


```
In [65]: suicide = pd.read_csv("suicide.csv")
suicide.head(10)
```

Out[65]:

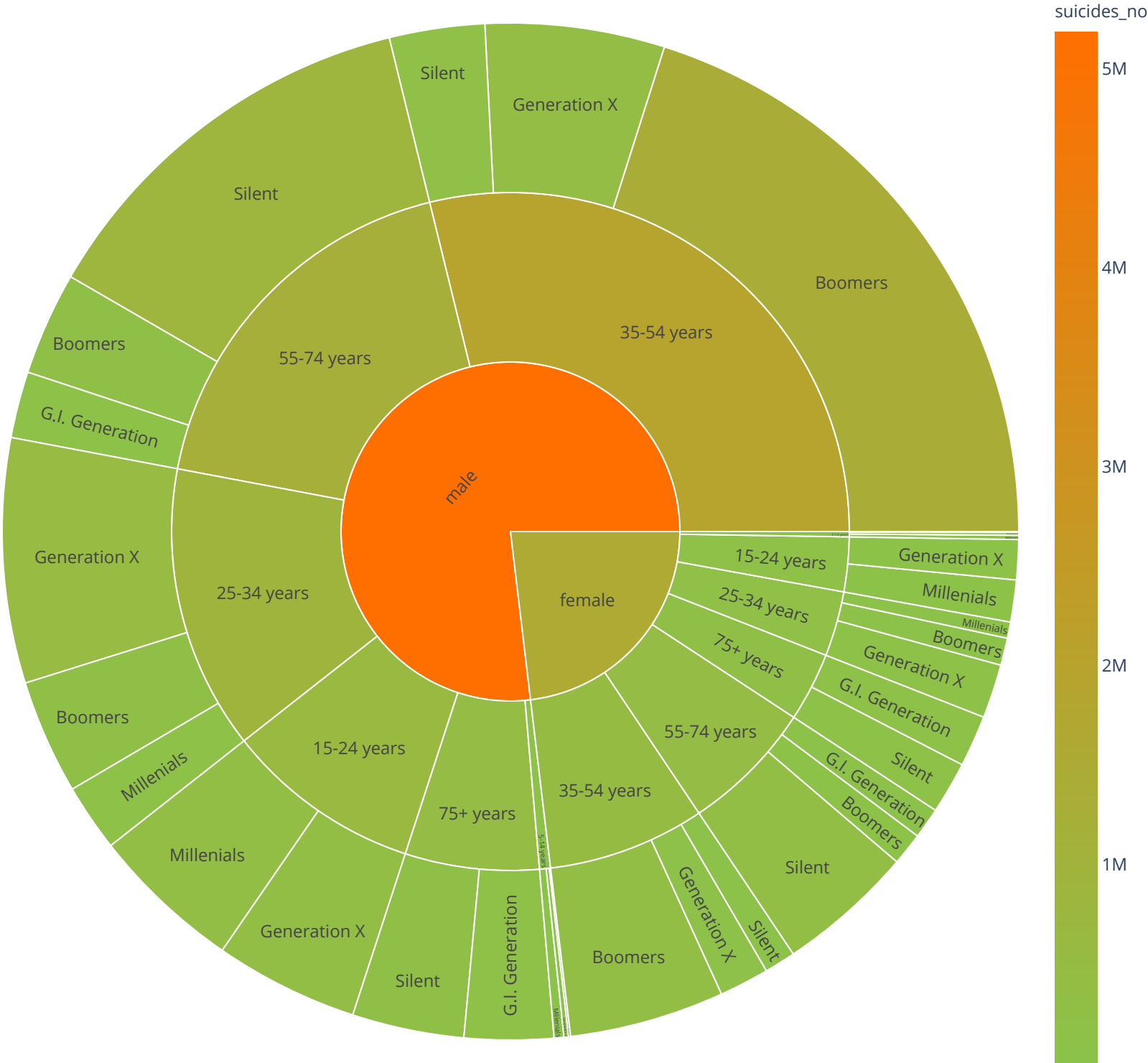
	country	year	sex	age	suicides_no	population	suicides/100k pop	country-year	HDI for year	gdp_for_year (\$)	gdp_per_capita (\$)	generation
0	Albania	1987	male	15-24 years	21	312900	6.71	Albania1987	NaN	2,156,624,900	796	Generation X
1	Albania	1987	male	35-54 years	16	308000	5.19	Albania1987	NaN	2,156,624,900	796	Silent
2	Albania	1987	female	15-24 years	14	289700	4.83	Albania1987	NaN	2,156,624,900	796	Generation X
3	Albania	1987	male	75+ years	1	21800	4.59	Albania1987	NaN	2,156,624,900	796	G.I. Generation
4	Albania	1987	male	25-34 years	9	274300	3.28	Albania1987	NaN	2,156,624,900	796	Boomers
5	Albania	1987	female	75+ years	1	35600	2.81	Albania1987	NaN	2,156,624,900	796	G.I. Generation
6	Albania	1987	female	35-54 years	6	278800	2.15	Albania1987	NaN	2,156,624,900	796	Silent
7	Albania	1987	female	25-34 years	4	257200	1.56	Albania1987	NaN	2,156,624,900	796	Boomers
8	Albania	1987	male	55-74 years	1	137500	0.73	Albania1987	NaN	2,156,624,900	796	G.I. Generation
9	Albania	1987	female	5-14 years	0	311000	0.00	Albania1987	NaN	2,156,624,900	796	Generation X

```
In [66]: fig = px.sunburst(suicide, path=['sex', 'age' , 'generation'], values='suicides_no')
fig.update_layout (height = 900 , width = 900)
fig.show()
```



```
In [67]: fig = px.sunburst(
    suicide, path=['sex', 'age' , 'generation'],
    values='suicides_no' ,
    color= 'suicides_no' ,
    color_continuous_scale=["#8BC34A", "#FF6F00"]
)

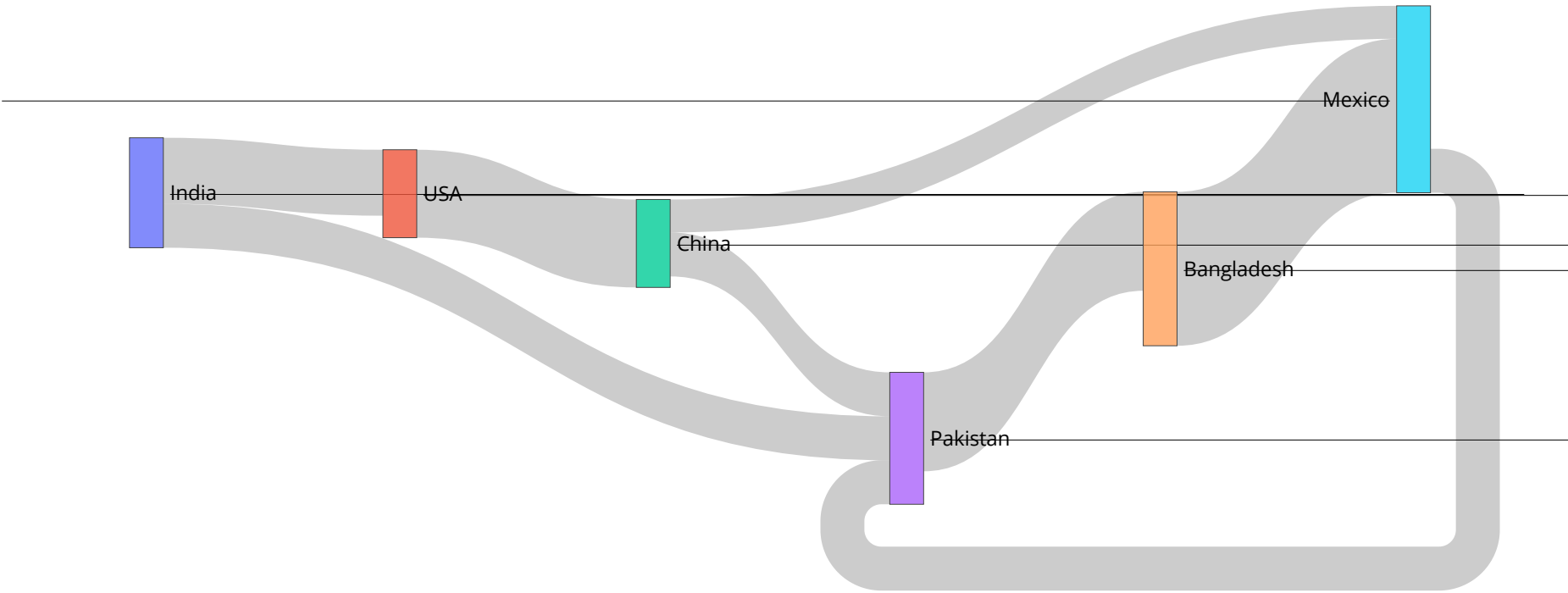
fig.update_layout (height = 900 , width = 900)
fig.show()
```



▼ **Sankey Diagram**

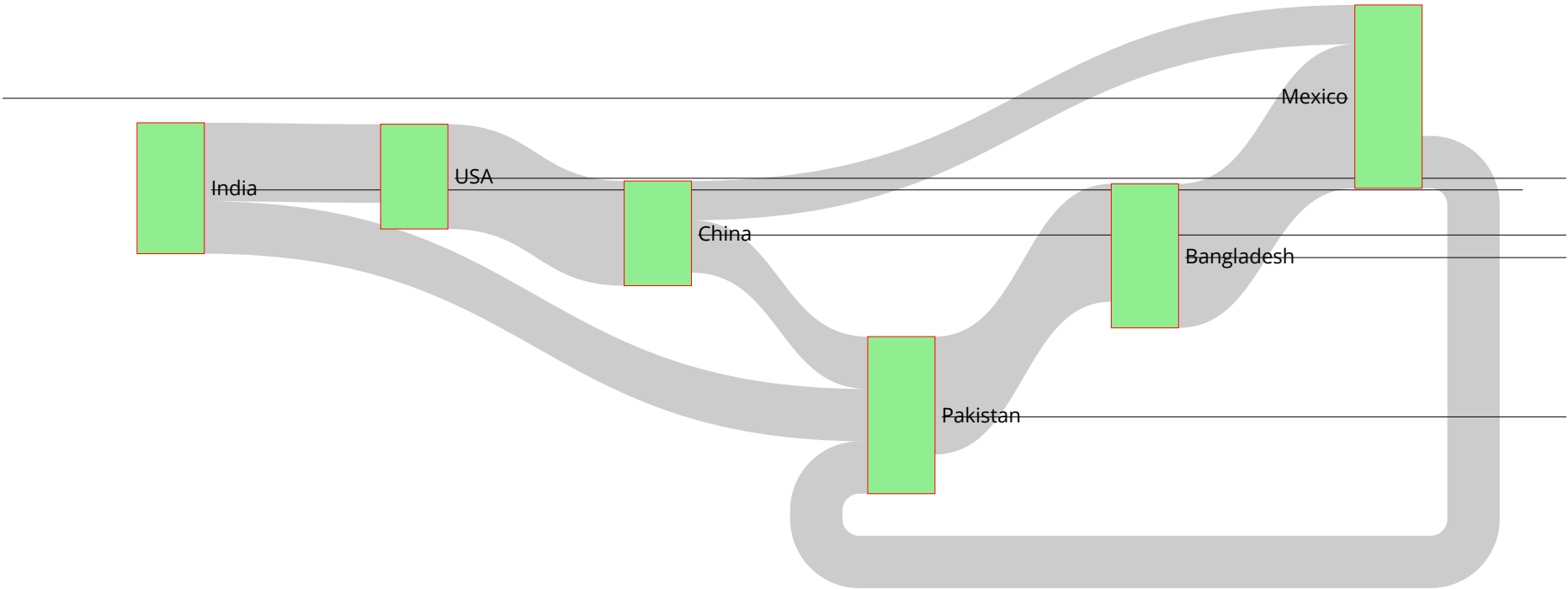
In [123]: *#Simple Sankey Diagram*

```
fig = go.Figure(  
    go.Sankey(  
        node = {  
            "label": ["India", "USA", "China", "Pakistan", "Bangladesh", "Mexico"],  
        },  
        link = {  
            "source": [0, 1, 2, 3, 4, 0, 2, 5],  
            "target": [1, 2, 3, 4, 5, 3, 5, 3],  
            "value": [300, 400, 200, 450, 700, 200,150, 200]  
        }  
    )  
)  
  
# Hide grid Lines  
fig.update_xaxes(showgrid=False)  
fig.update_yaxes(showgrid=False)  
  
fig.show()
```



In [124]: *#Simple Sankey Diagram*

```
fig = go.Figure(  
    go.Sankey(  
        node = dict(  
            thickness = 40, # Changing thickness of nodes  
            color = "lightgreen", # Changing color of the node  
            line = dict(color = "red", width = 0.5), # Changing line color  
            label = ["India", "USA", "China", "Pakistan", "Bangladesh", "Mexico"],  
        ),  
        link = {  
            "source": [0, 1, 2, 3, 4, 0, 2, 5],  
            "target": [1, 2, 3, 4, 5, 3, 5, 3],  
            "value": [300, 400, 200, 450, 550, 200,150, 200]  
        }  
    )  
)  
  
# Hide grid lines  
fig.update_xaxes(showgrid=False)  
fig.update_yaxes(showgrid=False)  
  
fig.show()
```



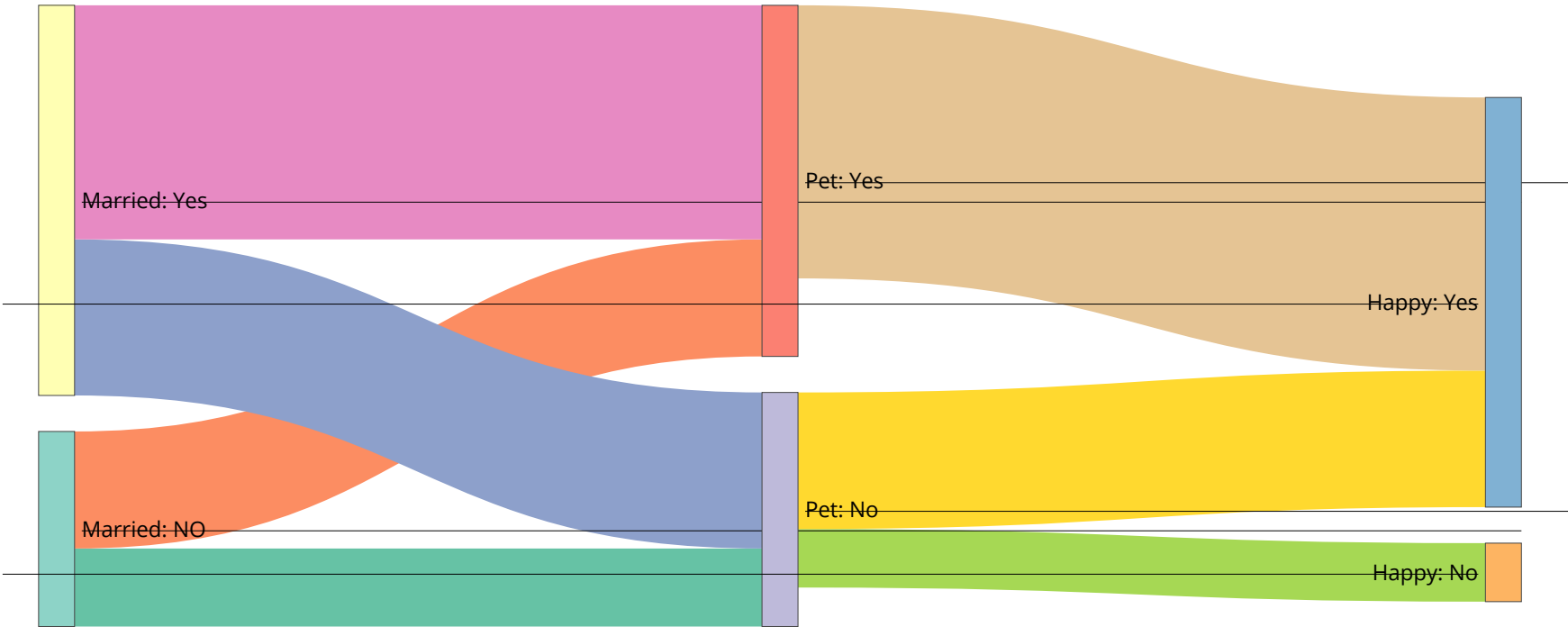
In [125]:

```
#Simple Sankey Diagram

fig = go.Figure(
    go.Sankey(
        node = {
            "label": ["Married: NO", "Married: Yes",
                    "Pet: No", "Pet: Yes",
                    "Happy: Yes", "Happy: No"],
            "color" : px.colors.qualitative.Set3 # Node color
        },
        link = dict(
            source = [0, 0, 1, 1, 2, 2, 3, 5],
            target = [2, 3, 2, 3, 5, 4, 4, 3],
            value = [200, 300, 400, 600, 150, 350,700],
            color = px.colors.qualitative.Set2 # Color of Links
        )
    )

# Hide grid Lines
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)

fig.show()
```



In []:

In []:

▼

END