In [1]:
```
import numpy as np, pandas as pd
import sklearn

import plotly.express as px
import plotly.graph_objects as go
import matplotlib.pyplot as plt
import seaborn as sns

import warnings
warnings.filterwarnings('ignore')

%matplotlib inline
```

In [2]:
```
data = pd.read_csv('International_Breweries.csv')
```

In [3]:
```
data.head()
```

Out[3]:

	SALES_ID	SALES_REP	EMAILS	BRANDS	PLANT_COST	UNIT_PRICE	QUANTIT
0	10101	Jardine	jard@gmail.com	trophy	150	200	7
1	10102	Gill	gillhell@uk.com	budweiser	250	500	8
2	10103	Sorvino	sorvi2000@gmail.com	castle lite	180	450	9
3	10104	Jones	jone.ai@yahoo.com	eagle lager	170	250	7
4	10105	Andrews	andy@gmail.com	hero	150	200	8

In [4]:
```
data.columns = [column.lower() for column in data.columns]
data.columns = [col.replace(' ', '') for col in data.columns]
data.head()
```

Out[4]:

	sales_id	sales_rep	emails	brands	plant_cost	unit_price	quantity	cost
0	10101	Jardine	jard@gmail.com	trophy	150	200	725	145000
1	10102	Gill	gillhell@uk.com	budweiser	250	500	815	407500
2	10103	Sorvino	sorvi2000@gmail.com	castle lite	180	450	937	421650
3	10104	Jones	jone.ai@yahoo.com	eagle lager	170	250	765	191250
4	10105	Andrews	andy@gmail.com	hero	150	200	836	167200

In [7]:
```
df = data.copy()
```

In [9]:

```
df['country_type'] = [
    'Anglophone'
    if count == 'Nigeria' or count == 'Ghana' else 'Francophone'
    for count in df.countries
]
df.head()
```

Out[9]:

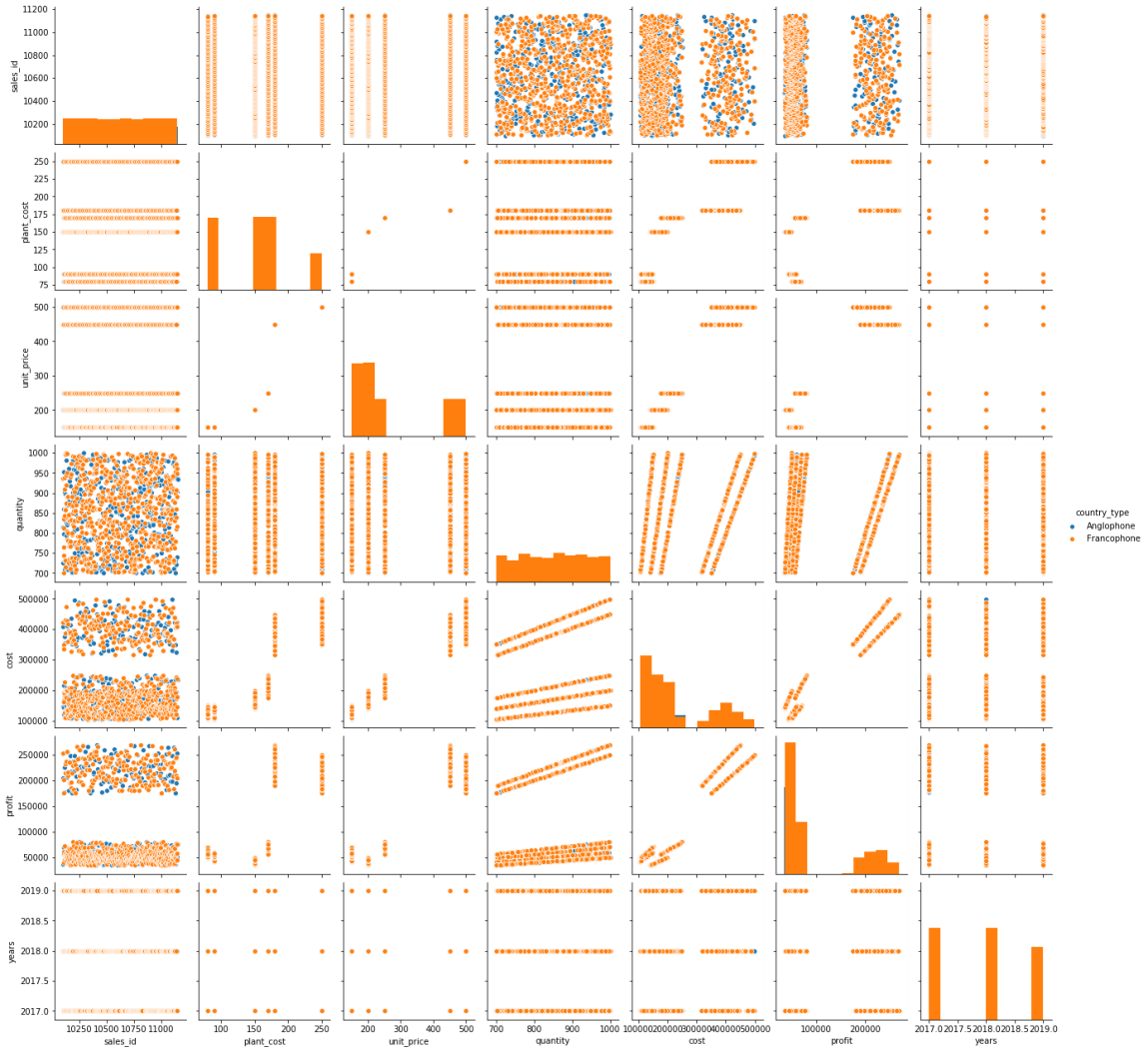
lant_cost	unit_price	quantity	cost	profit	countries	region	months	years	country_typ
150	200	725	145000	36250	Ghana	Southeast	January	2019	Anglophon
250	500	815	407500	203750	Nigeria	west	February	2018	Anglophon
180	450	937	421650	252990	Togo	southsouth	March	2018	Francophon
170	250	765	191250	61200	Benin	northwest	April	2018	Francophon
150	200	836	167200	41800	Senegal	northeast	May	2017	Francophon

In [9]:

```
plt.figure(figsize= (15, 25))
sns.pairplot(data = df,
             hue= 'country_type',
            diag_kind = 'hist')
```

Out[9]:

```
<seaborn.axisgrid.PairGrid at 0x701426b1d0>

<Figure size 1080x1800 with 0 Axes>
```



SECTION A

PROFIT ANALYSIS

PROFIT ANALYSIS

1. Within the space of the last three years, what was the profit worth of the breweries, inclusive of the anglophone and the francophone territories?

2. Compare the total profit between these two territories in order for the territory manager, Mr.Stone make strategic decision that will aid profit maximization in 2020.
3. Country that generated the highest profit in 2019
4. Help him find the year with the highest profit.
5. Which month in the three years were the least profit generated?
6. What was the minimum profit in the month of December 2018?
7. Compare the profit in percentage for each of the month in 2019
8. Which particular brand generated the highest profit in Senegal?

1. Within the space of the last three years, what was the profit worth of the breweries, inclusive of the anglophone and the francophone territories?

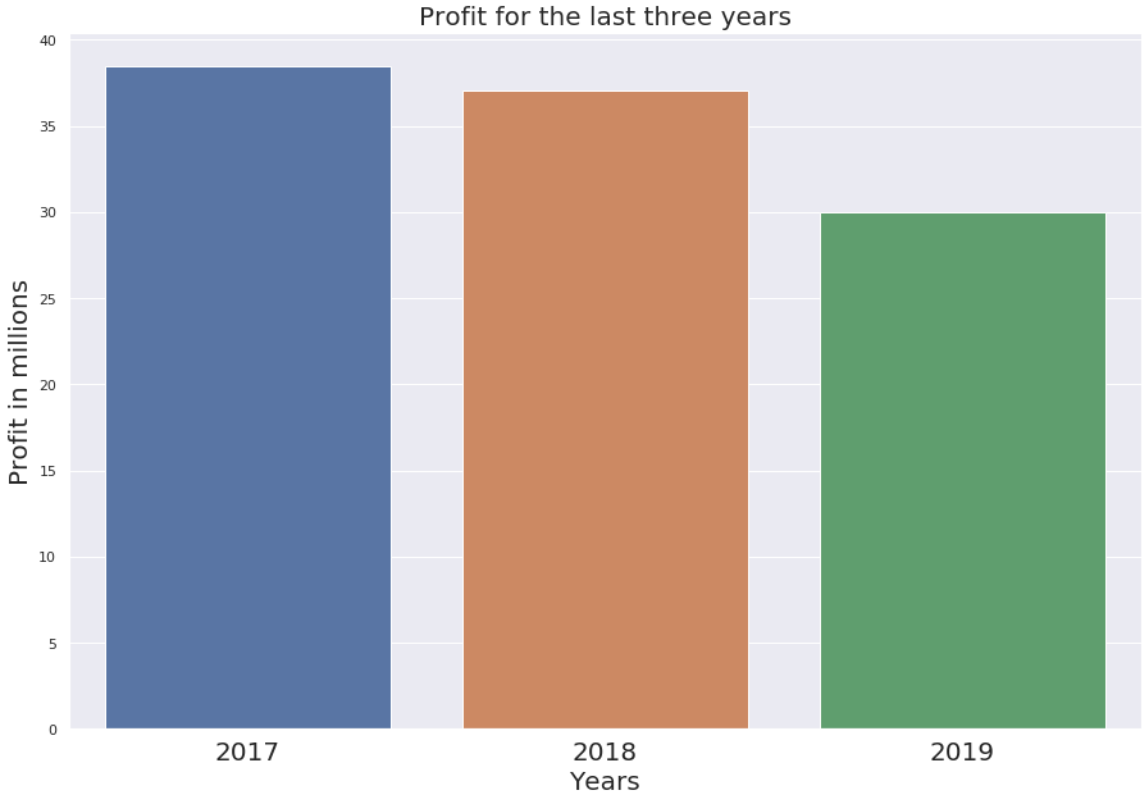
In [11]:
```
profit_for_years = df.groupby('years').sum()[['profit']].reset_index(
#profit_for_years = profit_for_years[['profit']]
profit_for_years
```

Out[11]:

	years	profit
0	2017	38503320
1	2018	37063850
2	2019	30020250

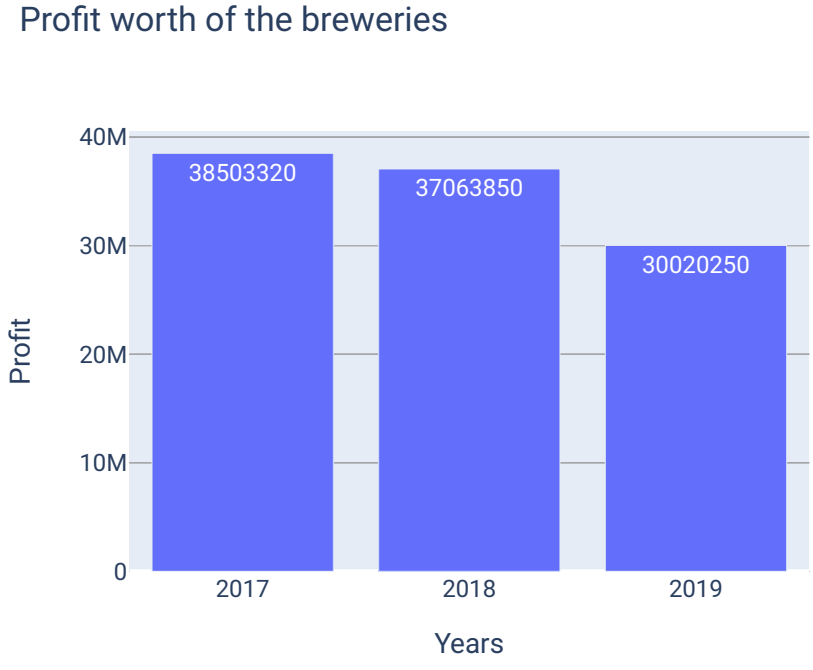
In [12]:

```
plt.figure(figsize=(15, 10))
sns.set(style = 'darkgrid')
col = sns.color_palette('Blues_d', len(profit_for_years))

chart = sns.barplot(x=profit_for_years.years,
                    y= profit_for_years.profit/1000000)

chart.set_xticklabels(chart.get_xticklabels(), fontsize= 20)
chart.set_ylabel('Profit in millions', fontsize = 20)
chart.set_xlabel('Years', fontsize= 20)
plt.title('Profit for the last three years',fontsize =20)
plt.show()
```



In [14]:

```
fig = go.Figure(data = [go.Bar(
    x= profit_for_years.years,
    y = profit_for_years.profit,
    text = profit_for_years.profit,
    textposition = 'auto',
)])

fig.update_layout(
    autosize= False,
    width = 500,
    height = 400,
    xaxis_title="Years",
    yaxis_title= "Profit",
    title_text = 'Profit worth of the breweries'

)

fig.show()
```



2. Compare the total profit between these two territories in order for the territory manager, Mr.Stone make strategic decision that will aid profit maximization in 2020.

In [24]:

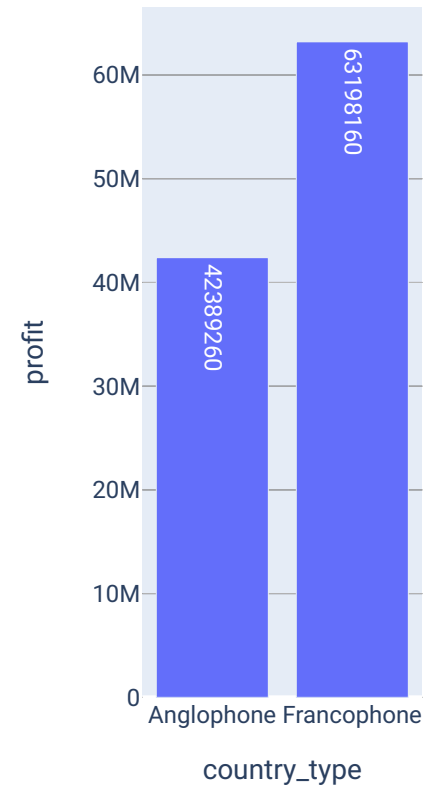
```
data2 = df[['years', 'country_type', 'profit']]
data2 = data2.groupby(['years', 'country_type']).sum().reset_index()
data2b = data2.groupby(['country_type'])['profit'].sum().reset_index(
display(data2b)
display(data2)
```

	country_type	profit
0	Anglophone	42389260
1	Francophone	63198160

	years	country_type	profit
0	2017	Anglophone	15749550
1	2017	Francophone	22753770
2	2018	Anglophone	14690320
3	2018	Francophone	22373530
4	2019	Anglophone	11949390
5	2019	Francophone	18070860

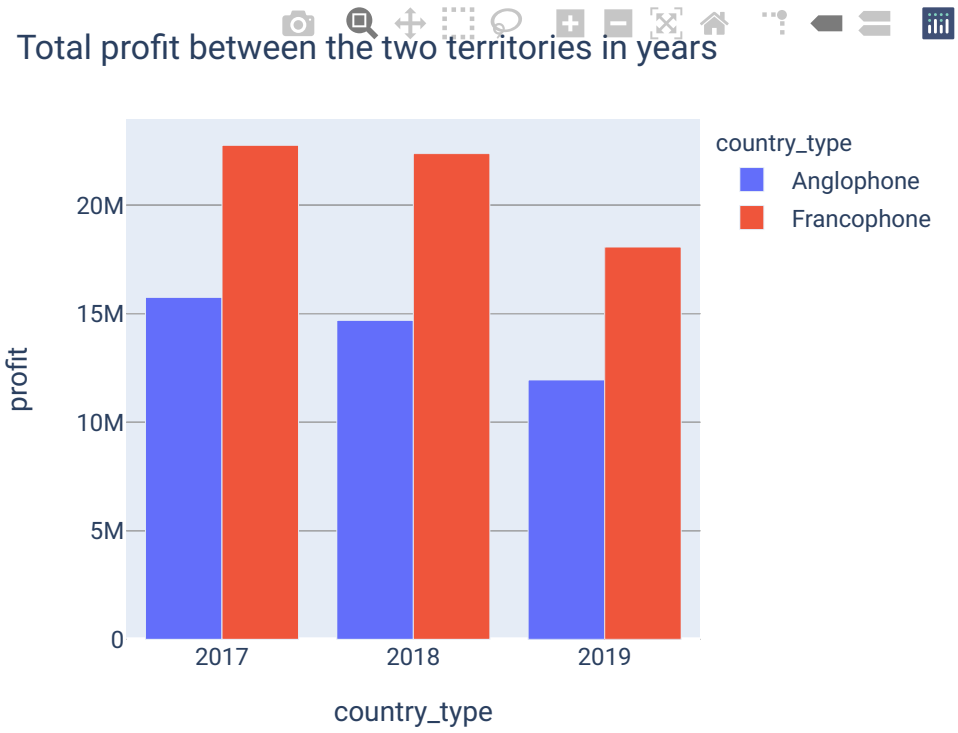
In [27]:

```
fig = go.Figure(data = [go.Bar(x= data2b.country_type,
                               y= data2b.profit,
                               text = data2b.profit,
                               textposition = 'auto',
                               )])
fig.update_layout(width= 300,
                  xaxis_title="country_type",
                  yaxis_title= "profit",
                  title_text='Total profit between the two territorie
fig.show()
```



In [29]:

```
fig = px.bar(data_frame = data2, x='years',
             y='profit',
             color= 'country_type',
             barmode= 'group', width = 400, height = 400)

fig.update_layout(width= 500,
                  xaxis_title="country_type",
                  yaxis_title= "profit",
                  title_text='Total profit between the two territorie

fig.show()
```



3. Country that generated the highest profit in 2019

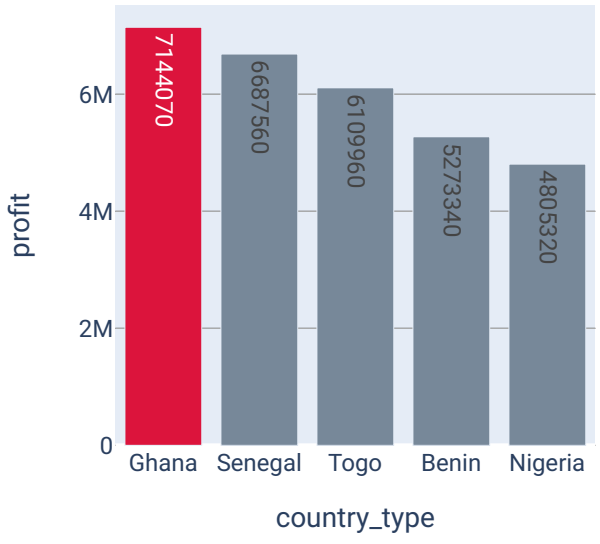
In [31]:
```
data3 = df[df['years'] == 2019]

data3 = data3[['countries', 'profit']].groupby(
    'countries').sum().sort_values('profit', ascending = False).reset
data3
```

Out[31]:

	countries	profit
0	Ghana	7144070
1	Senegal	6687560
2	Togo	6109960
3	Benin	5273340
4	Nigeria	4805320

In [35]:

```
colors = ['lightslategray',] * 5
colors[0] = 'crimson'


fig = go.Figure(data= [go.Bar(x= data3.countries,
                              y= data3.profit,
                              text= data3.profit,
                              textposition = 'auto',
                              marker_color = colors)])

fig.update_layout(autosize= False,
                  width= 400,
                  height = 400,
                   xaxis_title="country_type",
                   yaxis_title= "profit",
                  title_text = 'Country that generated the highest pro

fig.show()
```



4. Help him find the year with the highest profit.

In [37]:

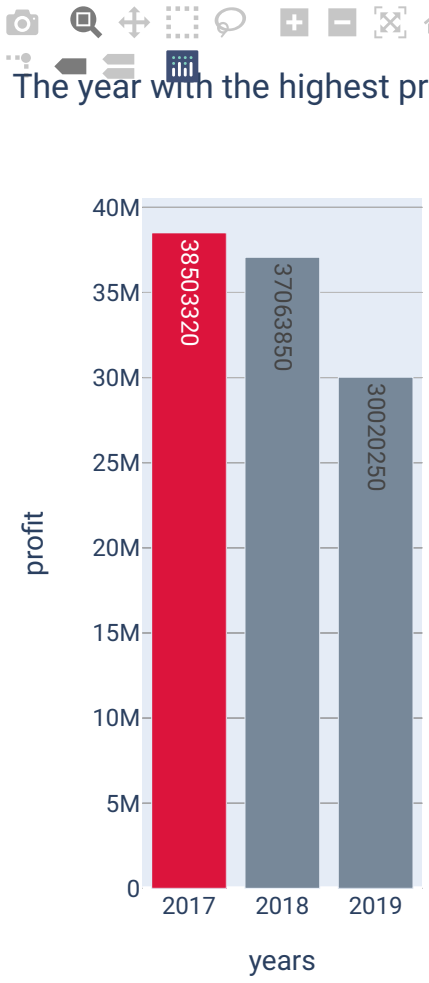
```
data4 = data2[['years', 'profit']].groupby(
    'years').sum().reset_index()

data4.head()
```

Out[37]:

	years	profit
0	2017	38503320
1	2018	37063850
2	2019	30020250

In [42]:

```
colors = ['lightslategray',] * 5
colors[0] = 'crimson'


fig = go.Figure(data = [go.Bar(x= data4.years,
                               y= data4.profit,
                               text = data4.profit,
                               textposition = 'auto',
                               marker_color = colors)])
fig.update_layout(width= 300,
                  xaxis_title= 'years',
                  yaxis_title = 'profit',
                 title_text = 'The year with the highest profit')
fig.show()
```



5. Which month in the three years were the least profit generated?

In [55]:

```
data5 = df[['years', 'months', 'profit']]

months = ["January", "February", "March", "April", "May", "June",
          "July", "August", "September", "October", "November", "Dece
data5['months'] = pd.Categorical(data5['months'], categories=months,
data5.sort_values(by = 'months')

data5chart = data5.groupby(
['months', 'years']).sum().reset_index()

data5chart1 = data5chart.groupby('months')['profit'].sum().reset_inde
data5chart1
```

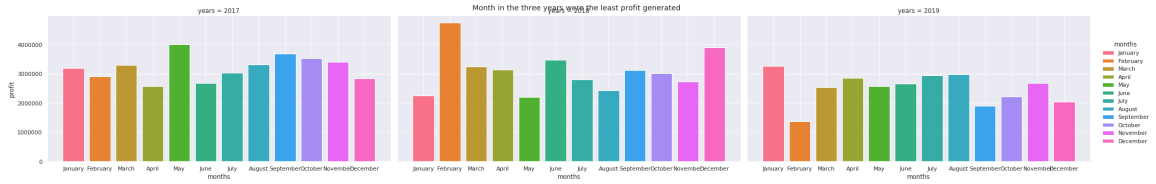
	months	profit
0	January	8722990
1	February	9028450
2	March	9066130
3	April	8573830
4	May	8772250
5	June	8828440
6	July	8787010
7	August	8730940
8	September	8702660
9	October	8767100
10	November	8820330
11	December	8787290

In [53]:

```
plt.figure(figsize= (40, 15))
chart = sns.FacetGrid(data = data5chart,
                      col= 'years', hue= 'months',
                     height= 5, aspect = 2)
chart.map(plt.bar,'months','profit')
chart.fig.suptitle('Month in the three years were the least profit ge
chart.add_legend()
```

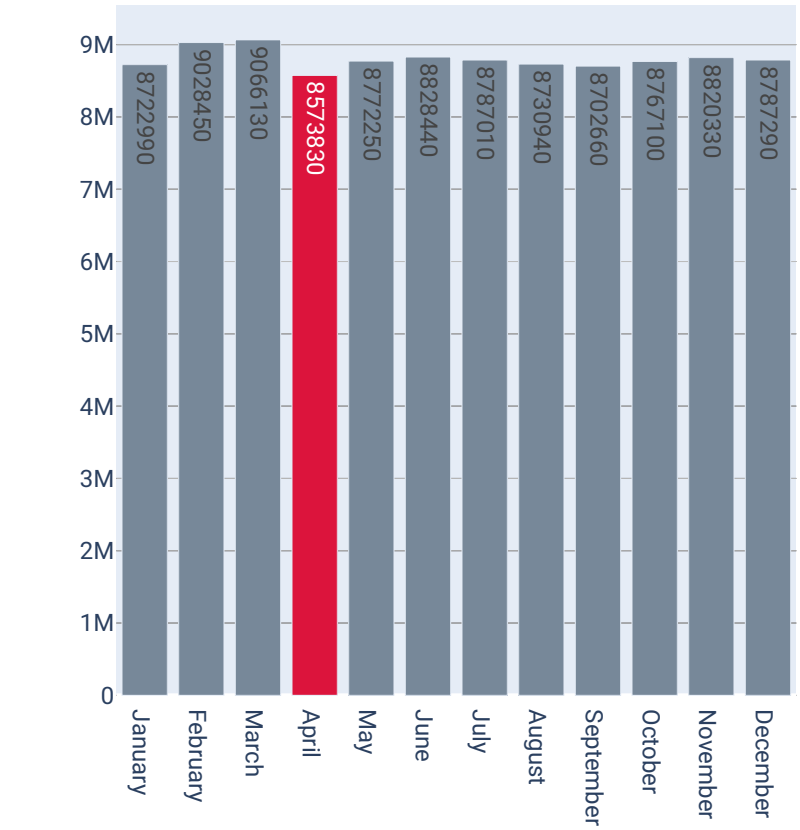
Out[53]:

```
<seaborn.axisgrid.FacetGrid at 0x7d8e369e80>

<Figure size 2880x1080 with 0 Axes>
```



In [57]:

```
colors = ['lightslategray',] * 12
colors[3] = 'crimson'

fig = go.Figure(data = [go.Bar(x= data5chart1.months,
                               y= data5chart1.profit,
                               text = data5chart1.profit,
                               textposition = 'auto',
                               marker_color= colors)])
fig.update_layout(width= 500,
                  title_text='Month with least profit ')

fig.show()
```



6. What was the minimum profit in the month of December 2018?

In [58]:
```
data7 = df[df['years'] == 2018][df['months']== 'December']
data7 = data7[['years', 'months', 'profit']].groupby(['years', 'month

data7
```

Out[58]:

	years	months	profit
0	2018	December	3902160

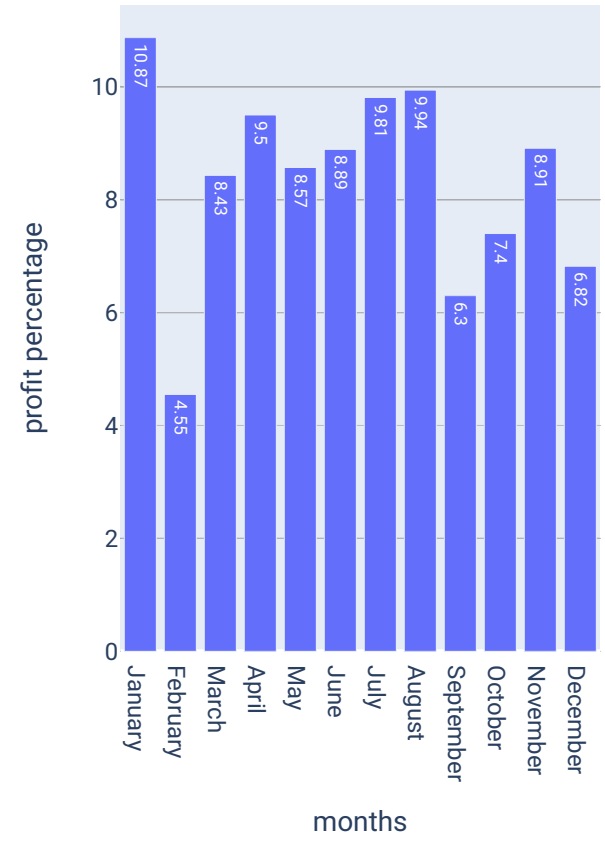
7. Compare the profit in percentage for each of the month in 2019

In [60]:
```
df['years'] == 2019]
a8[['years', 'months', 'profit']]

January", "February", "March", "April", "May", "June",
July", "August", "September", "October", "November", "December"]
ns'] = pd.Categorical(data8['months'], categories=months, ordered=True
values(by = 'months')

= data8.groupby(['years', 'months']).sum().reset_index()
'percent (%)'] = [round(i/sum(data8chart.profit)*100, 2)
                  for i in data8chart.profit]
```

Out[60]:

	years	months	profit	percent (%)
0	2019	January	3263160	10.87
1	2019	February	1366880	4.55
2	2019	March	2530620	8.43
3	2019	April	2851470	9.50
4	2019	May	2573040	8.57
5	2019	June	2669080	8.89
6	2019	July	2945340	9.81
7	2019	August	2982800	9.94
8	2019	September	1892600	6.30
9	2019	October	2220870	7.40
10	2019	November	2675610	8.91
11	2019	December	2048780	6.82

In [61]:
```
fig = go.Figure(data = [go.Bar(x= data8chart.months,
                               y= data8chart['percent (%)'],
                               text = data8chart['percent (%)'],
                               textposition = 'auto',
                               )])
fig.update_layout( width = 400,
                   xaxis_title = 'months',
                   yaxis_title = 'profit percentage',
                   title_text='Profit in percentage for each of the mo

fig.show()
```



8. Which particular brand generated the highest profit in Senegal?

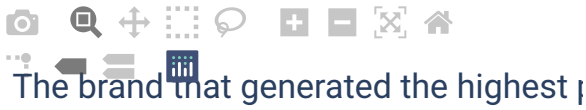
In [63]:
```
data9 = df[['brands','countries', 'profit']]
data9 = data9[data9['countries']== 'Senegal'].groupby(
['brands', 'countries',]).sum().reset_index()
data9
```

Out[63]:

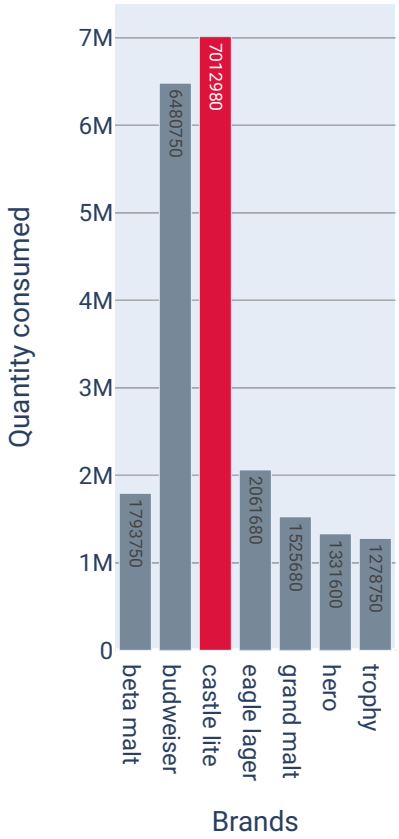
	brands	countries	profit
0	beta malt	Senegal	1793750
1	budweiser	Senegal	6480750
2	castle lite	Senegal	7012980
3	eagle lager	Senegal	2061680
4	grand malt	Senegal	1525680
5	hero	Senegal	1331600
6	trophy	Senegal	1278750

In [65]:

```
slategray',] * 7
mson'


data = [go.Bar(x= data9.brands,
               y= data9.profit,
               text = data9.profit,
               textposition = 'auto',
               marker_color= colors)])
t(width= 300,
  xaxis_title="Brands",
  yaxis_title= "Quantity consumed",
  title_text='The brand that generated the highest profit in Senegal')
```



The brand that generated the highest p



In [ ]:

SECTION B

BRAND ANALYSIS

BRAND ANALYSIS

1. Within the last two years, the brand manager wants to know the top three brands consumed in the francophone countries
2. Find out the top two choice of consumer brands in Ghana
3. Find out the details of beers consumed in the past three years in the most oil reach country in West Africa.
4. Favorites malt brand in Anglophone region between 2018 and 2019
5. Which brands sold the highest in 2019 in Nigeria?
6. Favorites brand in South_South region in Nigeria
7. Bear consumption in Nigeria
8. Level of consumption of Budweiser in the regions in Nigeria
9. Level of consumption of Budweiser in the regions in Nigeria in 2019 (Decision on Promo)

1. Within the last two years, the brand manager wants to know the top three brands consumed in the francophone countries

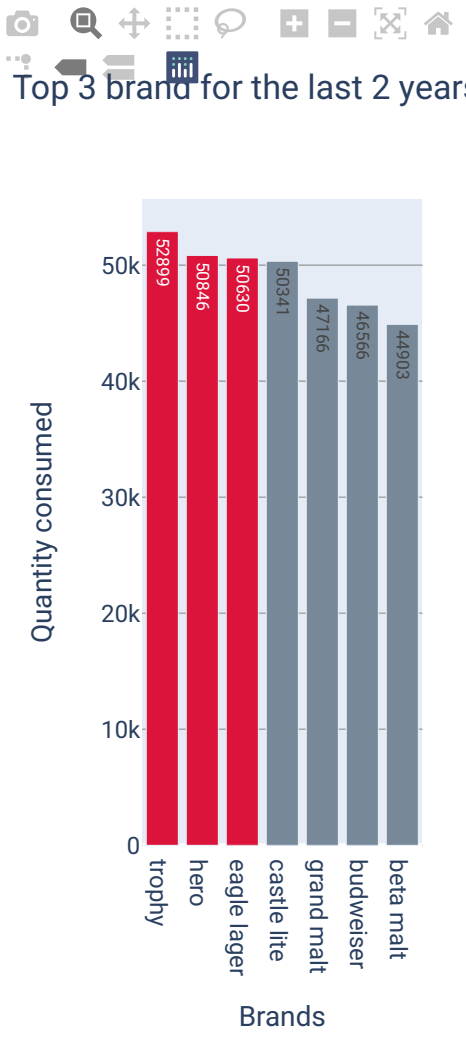
In [100]:
```
df1 = df[['years', 'brands', 'country_type', 'quantity']]
df2 = df1[df1['country_type']== 'Francophone'][df1.years!= 2017]
df2 = df2.groupby(['brands', 'country_type']
                  )['quantity'].sum().reset_index()
df2 = df2.sort_values('quantity', ascending= False).reset_index(drop=

df2.head(3)
```

Out[100]:

	brands	country_type	quantity
0	trophy	Francophone	52899
1	hero	Francophone	50846
2	eagle lager	Francophone	50630

In [102]:

```
colors = ['lightslategray',] * 7
colors[1] = 'crimson'
colors[2] = 'crimson'
colors[0] = 'crimson'



fig = go.Figure(data = [go.Bar(x= df2.brands,
                               y= df2.quantity,
                               text = df2.quantity,
                               textposition = 'auto',
                               marker_color= colors)])
fig.update_layout(width= 300,
                  xaxis_title="Brands",
                  yaxis_title= "Quantity consumed",
                  title_text='Top 3 brand for the last 2 years')

fig.show()
```



2. Find out the top two choice of consumer brands in Ghana

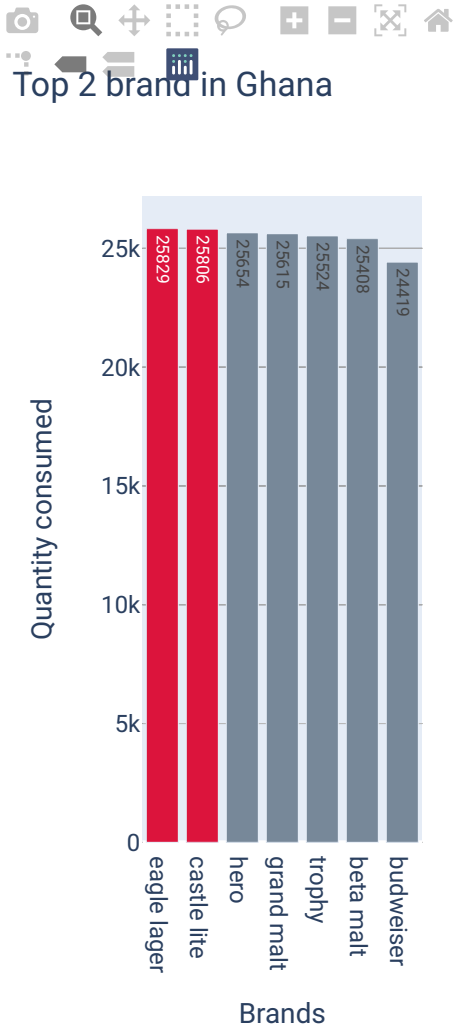
In [98]:
```
df3 = df[['years', 'brands', 'countries', 'quantity']]
df3 = df3[df3['countries']== 'Ghana']
df3 = df3.groupby(['brands', 'countries']
                  )['quantity'].sum().reset_index()
df3 = df3.sort_values('quantity', ascending= False).reset_index(drop=


df3.head(2)
```

Out[98]:

	brands	countries	quantity
0	eagle lager	Ghana	25829
1	castle lite	Ghana	25806

In [99]:

```
colors = ['lightslategray',] * 7
colors[1] = 'crimson'
colors[0] = 'crimson'



fig = go.Figure(data = [go.Bar(x= df3.brands,
                               y= df3.quantity,
                               text = df3.quantity,
                               textposition = 'auto',
                               marker_color= colors)])
fig.update_layout(width= 300,
                  xaxis_title="Brands",
                  yaxis_title= "Quantity consumed",
                  title_text='Top 2 brand in Ghana')

fig.show()
```



3. Find out the details of beers consumed in the past three years in the most oil reach country in West Africa.

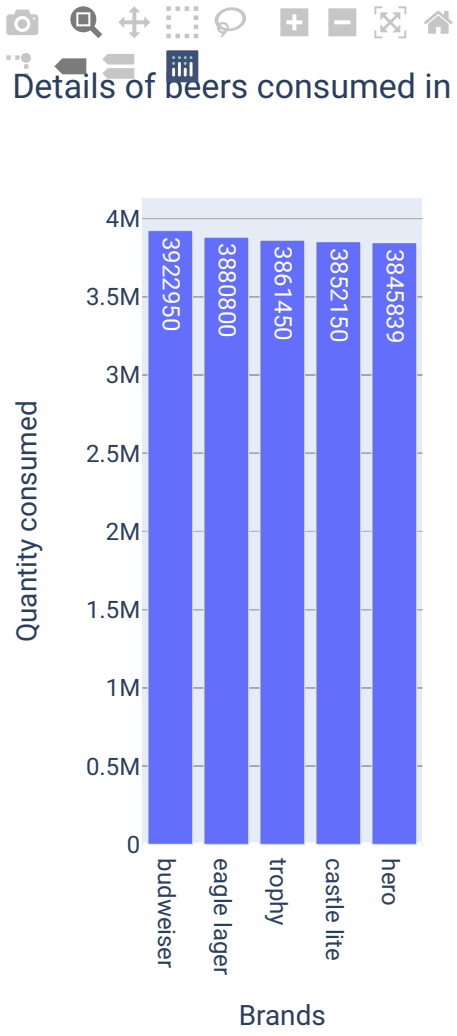
In [96]:
```
dfbeer = pd.concat([df.groupby('brands').get_group(mon) for mon in df

df4 = dfbeer[['brands', 'countries', 'quantity']]
df4 = df4[df4['countries']== 'Nigeria']
df4 = df4.groupby(['brands', 'countries']
                  )['quantity'].sum().reset_index()
df4 = df4.sort_values('quantity', ascending= False).reset_index(drop=


df4
```

Out[96]:

	brands	countries	quantity
0	budweiser	Nigeria	3922950
1	eagle lager	Nigeria	3880800
2	trophy	Nigeria	3861450
3	castle lite	Nigeria	3852150
4	hero	Nigeria	3845839

In [97]:

```
fig = go.Figure(data = [go.Bar(x= df4.brands,
                               y= df4.quantity,
                               text = df4.quantity,
                               textposition = 'auto',
                               )])
fig.update_layout(width= 300,
                  xaxis_title="Brands",
                  yaxis_title= "Quantity consumed",
                  title_text='Details of beers consumed in the past t

fig.show()
print('Details of beers consumed in the past three years in the most
```




```
Details of beers consumed in the past three years in the most oil re
ach country in West Africa.
```

4. Favorites malt brand in Anglophone region between 2018 and 2019

In [92]:

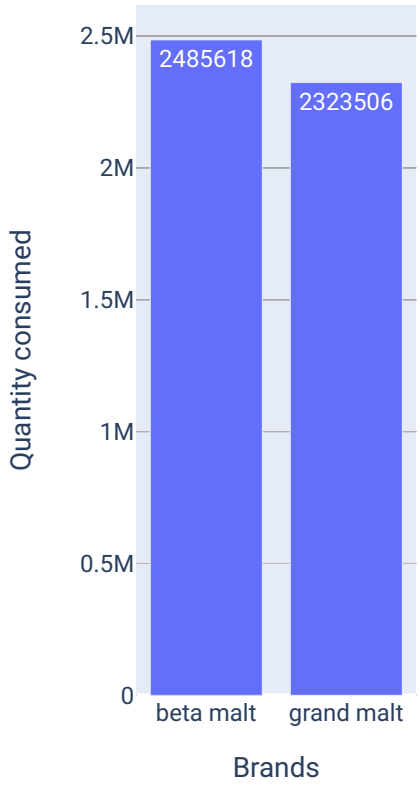
```
dfmalt = pd.concat([df.groupby('brands').get_group(mon) for mon in df

df5 = dfmalt[dfmalt['countries']== 'Nigeria'][df.country_type == 'Ang
df5 = df5.groupby(['brands', 'country_type']
                  )['quantity'].sum().reset_index()
df5 = df5.sort_values('quantity', ascending= False).reset_index(drop=
#df5 = df5[df5.brands== 'beta malt' or df5.brands == 'grand malt']#[d

df5
```

Out[92]:

	brands	country_type	quantity
0	beta malt	Anglophone	2485618
1	grand malt	Anglophone	2323506

In [93]:

```
fig = go.Figure(data = [go.Bar(x= df5.brands,
                               y= df5.quantity,
                               text = df5.quantity,
                               textposition = 'auto',
                               )])
fig.update_layout(width= 300,
                  xaxis_title="Brands",
                  yaxis_title= "Quantity consumed",
                  title_text='Favorites malt brand in Anglophone regi

fig.show()

print('Favorites malt brand in Anglophone region between 2018 and 201
```



Favorites malt brand in Anglophone region between 2018 and 2019

5. Which brands sold the highest in 2019 in Nigeria?

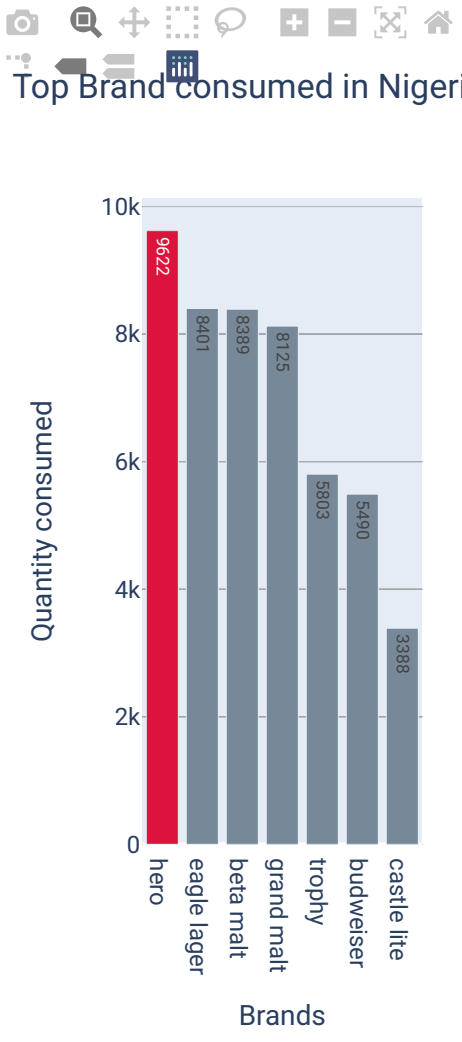
In [78]:
```
df5 = df[df['countries']== 'Nigeria'][df.years == 2019]
df5 = df5.groupby(['years','countries', 'brands'])['quantity'].sum().
df5 = df5.sort_values('quantity', ascending= False).reset_index(drop=
df5.head(1)
```

Out[78]:

	years	countries	brands	quantity
0	2019	Nigeria	hero	9622

In [79]:

```
colors = ['lightslategray',] * 7
colors[0] = 'crimson'

fig = go.Figure(data = [go.Bar(x= df5.brands,
                               y= df5.quantity,
                               text = df5.quantity,
                               textposition = 'auto',
                               marker_color = colors)])
fig.update_layout(width= 300,
                  xaxis_title="Brands",
                  yaxis_title= "Quantity consumed",
                  title_text='Top Brand consumed in Nigeria')

fig.show()
```



6. Favorites brand in South_South region in Nigeria

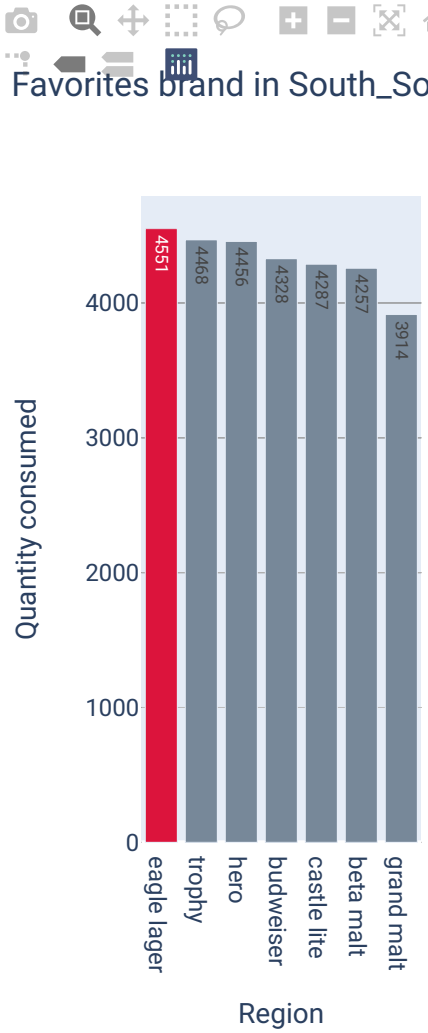
In [75]:
```
df6 = df[df['countries']== 'Nigeria'][df['region'] == 'southsouth']
df6 = df6.groupby(['region','countries', 'brands'])['quantity'].sum()
df6 = df6.sort_values('quantity', ascending= False).reset_index(drop=
df6.head()
```

Out[75]:

	region	countries	brands	quantity
0	southsouth	Nigeria	eagle lager	4551
1	southsouth	Nigeria	trophy	4468
2	southsouth	Nigeria	hero	4456
3	southsouth	Nigeria	budweiser	4328
4	southsouth	Nigeria	castle lite	4287

In [76]:

```
colors = ['lightslategray',] * 7
colors[0] = 'crimson'

fig = go.Figure(data = [go.Bar(x= df6.brands,
                               y= df6.quantity,
                               text = df6.quantity,
                               textposition = 'auto',
                               marker_color = colors)])
fig.update_layout(width= 300,
                  xaxis_title="Region",
                  yaxis_title= "Quantity consumed",
                  title_text='Favorites brand in South_South region i

fig.show()

print('Favorites brand in South_South region in Nigeria')
```




```
Favorites brand in South_South region in Nigeria
```

7. Bear consumption in Nigeria

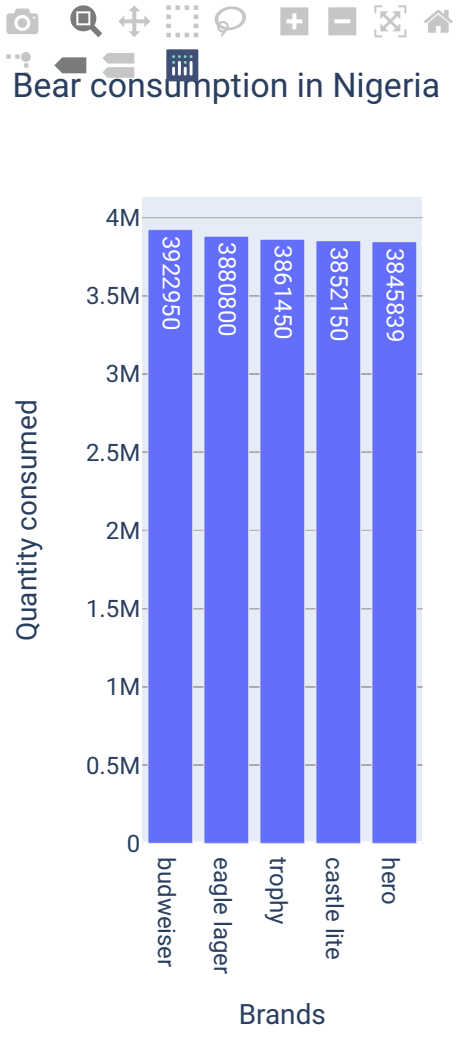
In [89]:
```
dfbeer = pd.concat([df.groupby('brands').get_group(mon) for mon in df

df7 = dfbeer[dfbeer['countries']== 'Nigeria']
df7 = df7.groupby(['brands','countries'])['quantity'].sum().reset_ind
df7 = df7.sort_values('quantity', ascending= False).reset_index(drop=
df7
```

Out[89]:

	brands	countries	quantity
0	budweiser	Nigeria	3922950
1	eagle lager	Nigeria	3880800
2	trophy	Nigeria	3861450
3	castle lite	Nigeria	3852150
4	hero	Nigeria	3845839

In [90]:

```
fig = go.Figure(data = [go.Bar(x= df7.brands,
                               y= df7.quantity,
                               text = df7.quantity,
                               textposition = 'auto',
                               )])
fig.update_layout(width= 300,
                  xaxis_title="Brands",
                  yaxis_title= "Quantity consumed",
                  title_text='Bear consumption in Nigeria')

fig.show()
```



8. Level of consumption of Budweiser in the regions in Nigeria

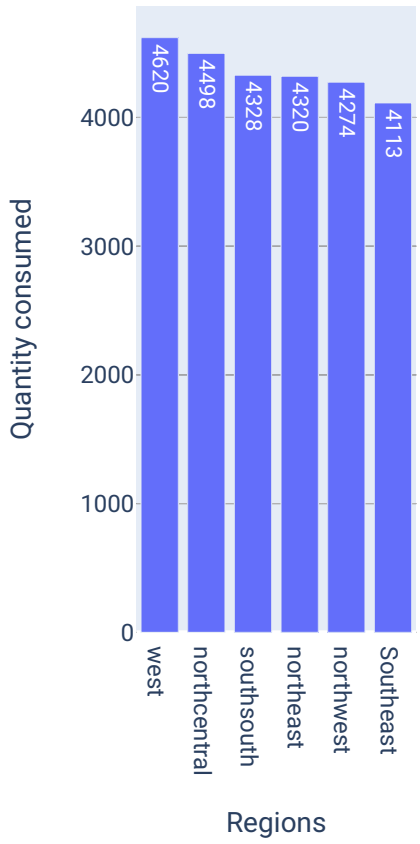
In [67]:
```
df8 = df[df['countries']== 'Nigeria'][df.brands == 'budweiser']
df8 = df8.groupby(['brands','countries','region'])['quantity'].sum().
df8 = df8.sort_values('quantity', ascending= False).reset_index(drop=

df8
```

Out[67]:

	brands	countries	region	quantity
0	budweiser	Nigeria	west	4620
1	budweiser	Nigeria	northcentral	4498
2	budweiser	Nigeria	southsouth	4328
3	budweiser	Nigeria	northeast	4320
4	budweiser	Nigeria	northwest	4274
5	budweiser	Nigeria	Southeast	4113

In [70]:

```
fig = go.Figure(data = [go.Bar(x= df8.region,
                               y= df8.quantity,
                               text = df8.quantity,
                               textposition = 'auto',
                               )])
fig.update_layout(width= 300,
                  xaxis_title="Regions",
                  yaxis_title= "Quantity consumed",
                  title_text='Level of consumption of Budweiser in th

fig.show()

print('Level of consumption of Budweiser in the regions in Nigeria')
```



Level of consumption of Budweiser in the regions in Nigeria

9. Level of consumption of Budweiser in the regions in Nigeria in 2019 (Decision on Promo)

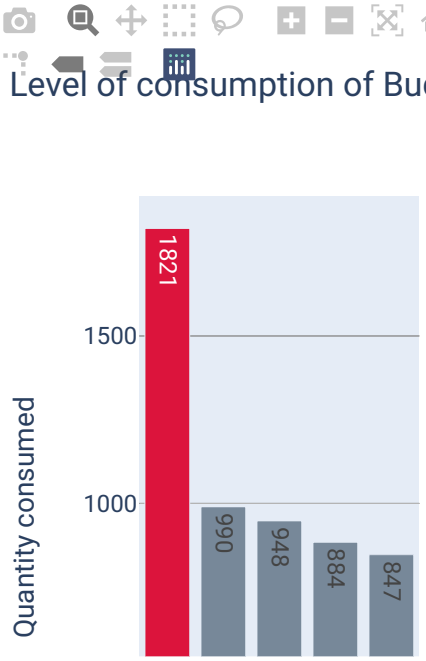
In [63]:
```
df9 = df[df['countries']== 'Nigeria'][df.brands == 'budweiser'][df.ye
df9 = df9.groupby(['brands','countries','years','region'])['quantity'
df9 = df9.sort_values('quantity', ascending= False).reset_index(drop=

df9
```

Out[63]:

	brands	countries	years	region	quantity
0	budweiser	Nigeria	2019	Southeast	1821
1	budweiser	Nigeria	2019	northeast	990
2	budweiser	Nigeria	2019	northwest	948
3	budweiser	Nigeria	2019	west	884
4	budweiser	Nigeria	2019	southsouth	847

In [65]:

```
colors = ['lightslategray',] * 7
colors[0] = 'crimson'


fig = go.Figure(data = [go.Bar(x= df9.region,
                               y= df9.quantity,
                               text = df9.quantity,
                               textposition = 'auto',
                               marker_color = colors)])
fig.update_layout(width= 300,
                  xaxis_title="Region",
                  yaxis_title= "Quantity consumed",
                  title_text='Level of consumption of Budweiser in th

fig.show()

print('Level of consumption of Budweiser in the regions in Nigeria in
```



In [ ]:

SECTION C

COUNTRIES ANALYSIS

COUNTRIES ANALYSIS

1. Country with the highest consumption of beer.
2. Highest sales personnel of Budweiser in Senegal
3. Country with the highest profit of the fourth quarter in 2019

1. Country with the highest consumption of beer.

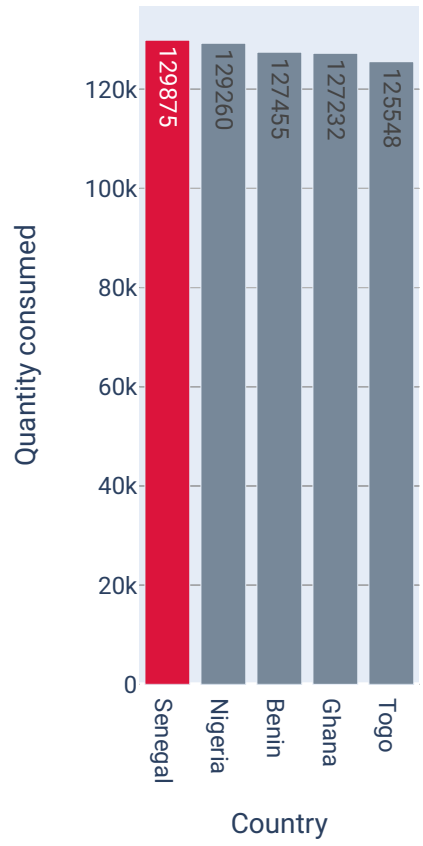
In [61]:
```
tb1 = df[df.brands != 'beta malt'][df.brands != 'grand malt']
tb1 = tb1.groupby(['countries',])['quantity'].sum().reset_index()
tb1 = tb1.sort_values('quantity', ascending= False).reset_index(drop=

tb1
#
```

Out[61]:

	countries	quantity
0	Senegal	129875
1	Nigeria	129260
2	Benin	127455
3	Ghana	127232
4	Togo	125548

In [62]:

```
colors = ['lightslategray',] * 7
colors[0] = 'crimson'


fig = go.Figure(data = [go.Bar(x= tb1.countries,
                               y= tb1.quantity,
                               text = tb1.quantity,
                               textposition = 'auto',
                               marker_color = colors)])
fig.update_layout(width= 300,
                  xaxis_title="Country",
                  yaxis_title= "Quantity consumed",
                  title_text='Country with the highest consumption of

fig.show()
```



2. Highest sales personnel of Budweiser in Senegal

In [11]:

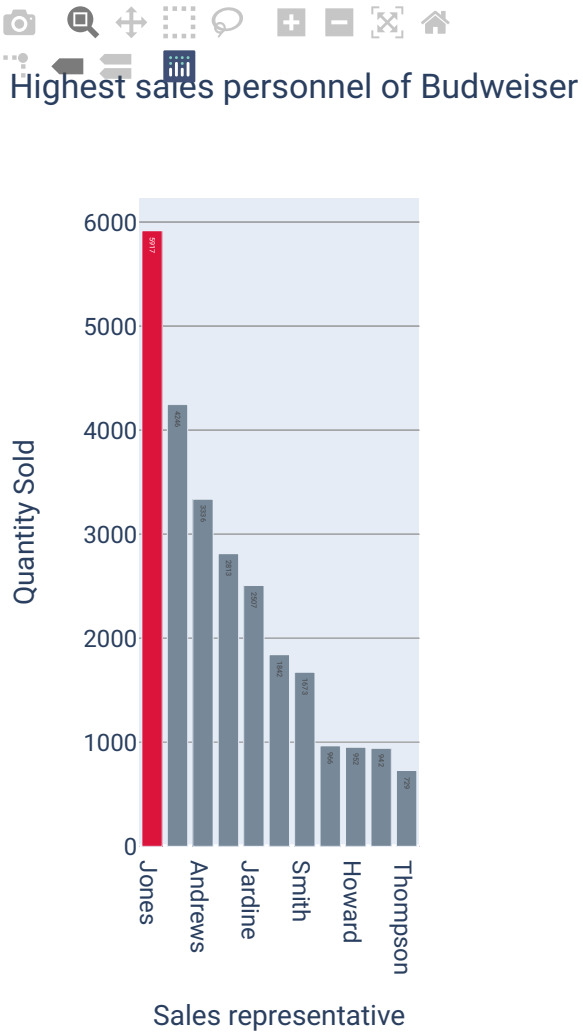
```
tb2 = df[df['countries']== 'Senegal'][df.brands == 'budweiser']
tb2 = tb2.groupby(['countries','brands','sales_rep'])['quantity'].sum
tb2 = tb2.sort_values('quantity', ascending= False).reset_index(drop=

tb2
```

Out[11]:

	countries	brands	sales_rep	quantity
0	Senegal	budweiser	Jones	5917
1	Senegal	budweiser	Sorvino	4246
2	Senegal	budweiser	Andrews	3336
3	Senegal	budweiser	Kivell	2813
4	Senegal	budweiser	Jardine	2507
5	Senegal	budweiser	Parent	1842
6	Senegal	budweiser	Smith	1673
7	Senegal	budweiser	Gill	966
8	Senegal	budweiser	Howard	952
9	Senegal	budweiser	Morgan	942
10	Senegal	budweiser	Thompson	729

In [58]:

```
colors = ['lightslategray',] * 11
colors[0] = 'crimson'


fig = go.Figure(data = [go.Bar(x= tb2.sales_rep,
                               y= tb2.quantity,
                               text = tb2.quantity,
                               textposition = 'auto',
                               marker_color = colors)])
fig.update_layout(width= 300,
                  xaxis_title="Sales representative",
                  yaxis_title= "Quantity Sold",
                  title_text='Highest sales personnel of Budweiser in

fig.show()
```



3. Country with the highest profit of the fourth quarter in 2019

In [84]:

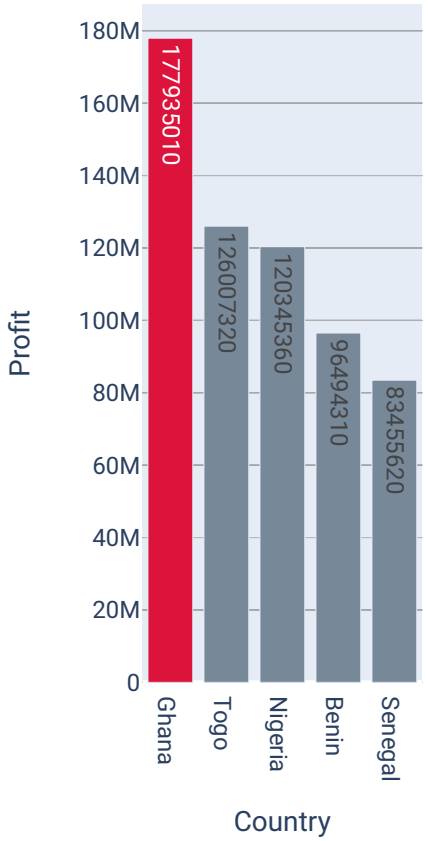
```
dfmonth = pd.concat([df.groupby('months').get_group(mon) for mon in d
tb3 = dfmonth[dfmonth.years== 2019]
tb3 = tb3.groupby(['years','countries',])['profit'].sum().reset_index
tb3 = tb3.sort_values('profit', ascending= False).reset_index(drop= T

tb3
```

Out[84]:

	years	countries	profit
0	2019	Ghana	177935010
1	2019	Togo	126007320
2	2019	Nigeria	120345360
3	2019	Benin	96494310
4	2019	Senegal	83455620

In [57]:

```
colors = ['lightslategray',] * 5
colors[0] = 'crimson'


fig = go.Figure(data = [go.Bar(x= tb3.countries,
                               y= tb3.profit,
                               text = tb3.profit,
                               textposition = 'auto',
                               marker_color = colors)])
fig.update_layout(width= 300,
                  xaxis_title="Country",
                  yaxis_title= "Profit",
                  title_text='Country with the highest profit in four

fig.show()
print('Country with the highest profit in fourth quarter in 2019')
```



Country with the highest profit in fourth quarter in 2019

In [ ]:

In [ ]:

In [ ]:

In [ ]: