

# Submission

Put the ipynb file and html file in the github branch you created in the last assignment and submit the link to the commit in brightspace

In [97]:

```
from plotly.offline import init_notebook_mode
import plotly.io as pio
import plotly.express as px

init_notebook_mode(connected=True)
pio.renderers.default = "plotly_mimetype+notebook"
```

In [98]:

```
#Load data
df = px.data.gapminder()
df.head()
```

Out[98]:

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

## Question 1:

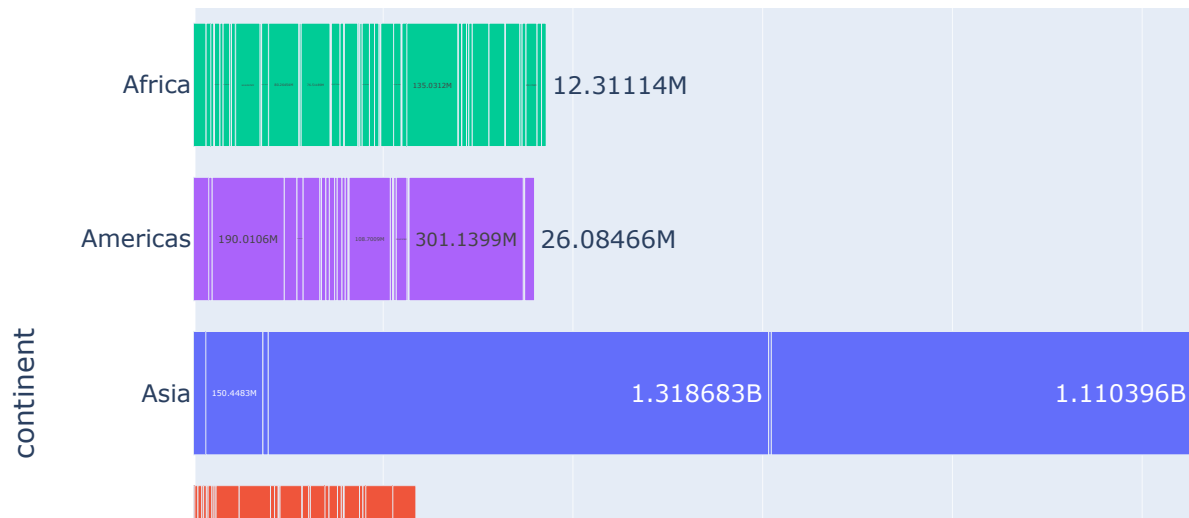
Recreate the barplot below that shows the population of different continents for the year 2007.

Hints:

- Extract the 2007 year data from the dataframe. You have to process the data accordingly
- use [plotly\\_bar](https://plotly.com/python-api-reference/generated/plotly.express.bar) (<https://plotly.com/python-api-reference/generated/plotly.express.bar>)
- Add different colors for different continents
- Sort the order of the continent for the visualisation. Use [axis layout setting](https://plotly.com/python/reference/layout/xaxis/) (<https://plotly.com/python/reference/layout/xaxis/>)
- Add text to each bar that represents the population

In [99]:

```
df_2007 = df.query('year==2007')
fig = px.bar(df_2007, x='pop', y='continent', color='continent',
             orientation='h', text_auto=True)
fig.update_yaxes(categoryorder='category descending')
fig.update_traces(textfont_size=12, textangle=0, textposition='outside',
                  cliponaxis=False)
fig.show()
```



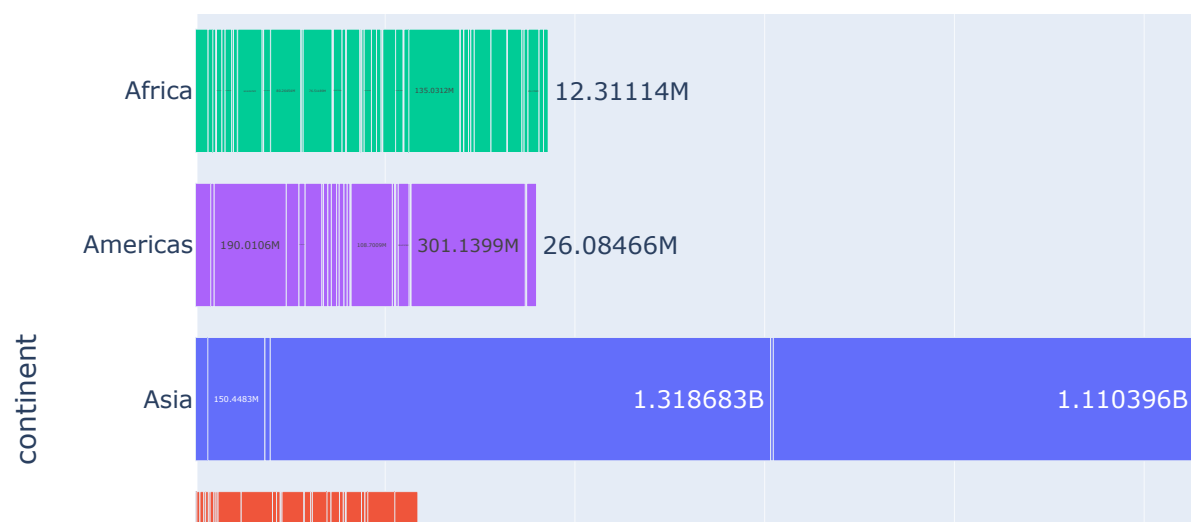
## Question 2:

Sort the order of the continent for the visualisation

Hint: Use [axis layout setting \(https://plotly.com/python/reference/layout/xaxis/\)](https://plotly.com/python/reference/layout/xaxis/).

In [100]:

```
df_2007 = df.query('year==2007')
fig = px.bar(df_2007, x='pop', y='continent', color='continent',
             orientation='h', text_auto=True)
fig.update_yaxes(categoryorder='category descending')
fig.update_traces(textfont_size=12, textangle=0, textposition='outside',
                  cliponaxis=False)
fig.show()
```

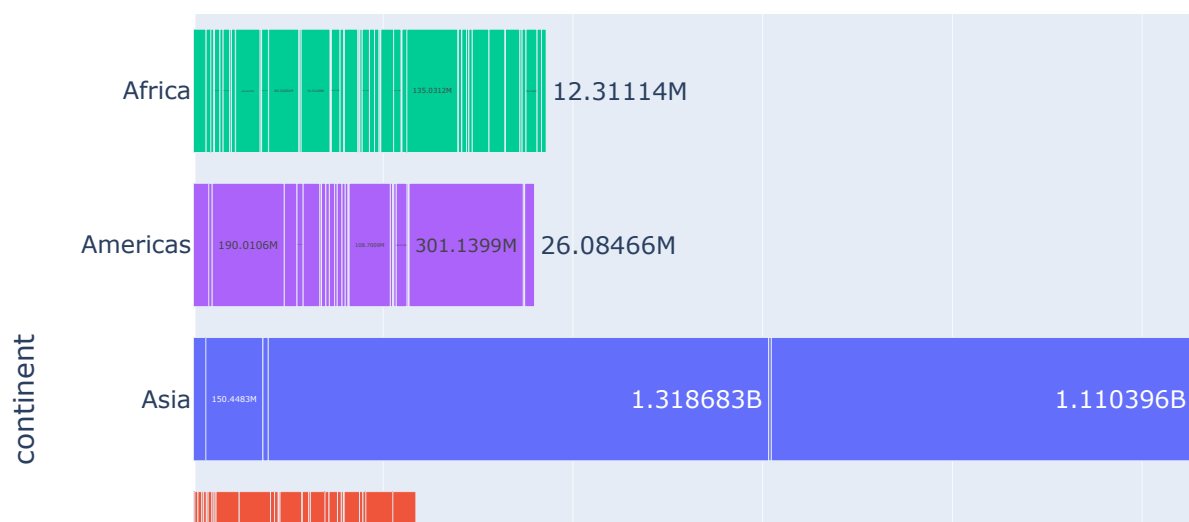


### Question 3:

Add text to each bar that represents the population

In [101]:

```
df_2007 = df.query('year==2007')
fig = px.bar(df_2007, x='pop', y='continent', color='continent',
             orientation='h', text_auto=True)
fig.update_yaxes(categoryorder='category descending')
fig.update_traces(textfont_size=12, textangle=0, textposition='outside',
                  cliponaxis=False)
fig.show()
```



## Question 4:

Thus far we looked at data from one year (2007). Lets create an animation to see the population growth of the continents through the years

In [102]:

df

Out[102]:

|      | country     | continent | year | lifeExp | pop      | gdpPercap  | iso_alpha | iso_num |
|------|-------------|-----------|------|---------|----------|------------|-----------|---------|
| 0    | Afghanistan | Asia      | 1952 | 28.801  | 8425333  | 779.445314 | AFG       | 4       |
| 1    | Afghanistan | Asia      | 1957 | 30.332  | 9240934  | 820.853030 | AFG       | 4       |
| 2    | Afghanistan | Asia      | 1962 | 31.997  | 10267083 | 853.100710 | AFG       | 4       |
| 3    | Afghanistan | Asia      | 1967 | 34.020  | 11537966 | 836.197138 | AFG       | 4       |
| 4    | Afghanistan | Asia      | 1972 | 36.088  | 13079460 | 739.981106 | AFG       | 4       |
| ...  | ...         | ...       | ...  | ...     | ...      | ...        | ...       | ...     |
| 1699 | Zimbabwe    | Africa    | 1987 | 62.351  | 9216418  | 706.157306 | ZWE       | 716     |
| 1700 | Zimbabwe    | Africa    | 1992 | 60.377  | 10704340 | 693.420786 | ZWE       | 716     |
| 1701 | Zimbabwe    | Africa    | 1997 | 46.809  | 11404948 | 792.449960 | ZWE       | 716     |
| 1702 | Zimbabwe    | Africa    | 2002 | 39.989  | 11926563 | 672.038623 | ZWE       | 716     |

In [103]:

```
df_new = df.groupby(['continent', 'year']).sum().reset_index()
df_new
```

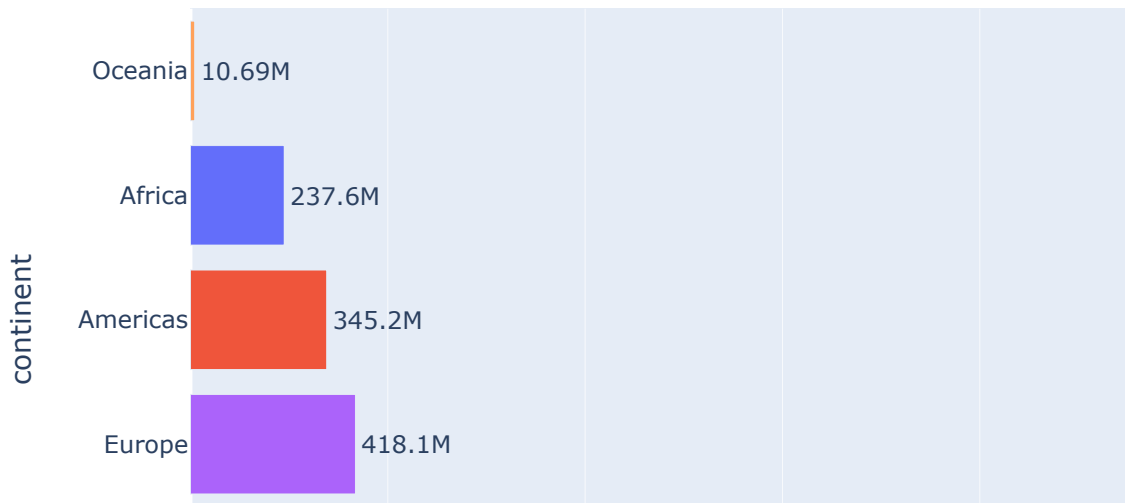
Out[103]:

|    | continent | year | lifeExp    | pop        | gdpPercap     | iso_num |
|----|-----------|------|------------|------------|---------------|---------|
| 0  | Africa    | 1952 | 2035.04600 | 237640501  | 65133.768223  | 23859   |
| 1  | Africa    | 1957 | 2145.85000 | 264837738  | 72032.275237  | 23859   |
| 2  | Africa    | 1962 | 2252.61100 | 296516865  | 83100.098892  | 23859   |
| 3  | Africa    | 1967 | 2357.39600 | 335289489  | 106618.917645 | 23859   |
| 4  | Africa    | 1972 | 2467.44900 | 379879541  | 121660.015058 | 23859   |
| 5  | Africa    | 1977 | 2578.18200 | 433061021  | 134468.802440 | 23859   |
| 6  | Africa    | 1982 | 2682.82900 | 499348587  | 129042.833907 | 23859   |
| 7  | Africa    | 1987 | 2773.92900 | 574834110  | 118698.787546 | 23859   |
| 8  | Africa    | 1992 | 2788.73800 | 659081517  | 118654.137329 | 23859   |
| 9  | Africa    | 1997 | 2787.11000 | 743832984  | 123695.496865 | 23859   |
| 10 | Africa    | 2002 | 2772.91200 | 833723916  | 135168.028262 | 23859   |
| 11 | Africa    | 2007 | 2849.91400 | 929539692  | 160629.695446 | 23859   |
| 12 | Americas  | 1952 | 1331.99600 | 345152446  | 101976.563805 | 9843    |
| 13 | Americas  | 1957 | 1399.00700 | 386953916  | 115401.093329 | 9843    |
| 14 | Americas  | 1962 | 1459.96900 | 433270254  | 122538.546760 | 9843    |
| 15 | Americas  | 1967 | 1510.27300 | 480746623  | 141706.337401 | 9843    |
| 16 | Americas  | 1972 | 1559.87300 | 529384210  | 162283.353476 | 9843    |
| 17 | Americas  | 1977 | 1609.78900 | 578067699  | 183800.178157 | 9843    |
| 18 | Americas  | 1982 | 1655.72100 | 630290920  | 187668.427202 | 9843    |
| 19 | Americas  | 1987 | 1702.26800 | 682753971  | 194835.006528 | 9843    |
| 20 | Americas  | 1992 | 1739.20900 | 739274104  | 201123.360138 | 9843    |
| 21 | Americas  | 1997 | 1778.76200 | 796900410  | 222232.521564 | 9843    |
| 22 | Americas  | 2002 | 1810.55100 | 849772762  | 232191.927683 | 9843    |
| 23 | Americas  | 2007 | 1840.20300 | 898871184  | 275075.790634 | 9843    |
| 24 | Asia      | 1952 | 1528.37500 | 1395357351 | 171450.972133 | 13354   |
| 25 | Asia      | 1957 | 1627.51196 | 1562780599 | 190995.187018 | 13354   |
| 26 | Asia      | 1962 | 1701.58636 | 1696357182 | 189069.197618 | 13354   |
| 27 | Asia      | 1967 | 1803.90012 | 1905662900 | 197048.721329 | 13354   |
| 28 | Asia      | 1972 | 1891.53588 | 2150972248 | 270186.467082 | 13354   |
| 29 | Asia      | 1977 | 1967.14836 | 2384513556 | 257113.362658 | 13354   |
| 30 | Asia      | 1982 | 2066.39200 | 2610135582 | 245326.460197 | 13354   |
| 31 | Asia      | 1987 | 2140.08900 | 2871220762 | 251071.474755 | 13354   |
| 32 | Asia      | 1992 | 2195.72800 | 3133292191 | 285109.778175 | 13354   |
| 33 | Asia      | 1997 | 2244.67700 | 3383285500 | 324525.078743 | 13354   |

|    | continent | year | lifeExp    | pop        | gdpPercap     | iso_num |
|----|-----------|------|------------|------------|---------------|---------|
| 34 | Asia      | 2002 | 2284.71800 | 3601802203 | 335744.983087 | 13354   |
| 35 | Asia      | 2007 | 2334.04000 | 3811953827 | 411609.886714 | 13354   |
| 36 | Europe    | 1952 | 1932.25500 | 418120846  | 169831.723043 | 12829   |
| 37 | Europe    | 1957 | 2001.09200 | 437890351  | 208890.384478 | 12829   |
| 38 | Europe    | 1962 | 2056.17700 | 460355155  | 250964.604429 | 12829   |
| 39 | Europe    | 1967 | 2092.12800 | 481178958  | 304314.712696 | 12829   |
| 40 | Europe    | 1972 | 2123.25100 | 500635059  | 374387.257394 | 12829   |
| 41 | Europe    | 1977 | 2158.13300 | 517164531  | 428519.373288 | 12829   |
| 42 | Europe    | 1982 | 2184.19200 | 531266901  | 468536.896537 | 12829   |
| 43 | Europe    | 1987 | 2209.26500 | 543094160  | 516429.321799 | 12829   |
| 44 | Europe    | 1992 | 2233.20300 | 558142797  | 511847.042526 | 12829   |
| 45 | Europe    | 1997 | 2265.15500 | 568944148  | 572303.454048 | 12829   |
| 46 | Europe    | 2002 | 2301.01800 | 578223869  | 651351.972673 | 12829   |
| 47 | Europe    | 2007 | 2329.45800 | 586098529  | 751634.449078 | 12829   |
| 48 | Oceania   | 1952 | 138.51000  | 10686006   | 20596.171300  | 590     |
| 49 | Oceania   | 1957 | 140.59000  | 11941976   | 23197.044910  | 590     |
| 50 | Oceania   | 1962 | 142.17000  | 13283518   | 25392.904860  | 590     |
| 51 | Oceania   | 1967 | 142.62000  | 14600414   | 28990.043580  | 590     |
| 52 | Oceania   | 1972 | 143.82000  | 16106100   | 32834.666760  | 590     |
| 53 | Oceania   | 1977 | 145.71000  | 17239000   | 34567.915210  | 590     |
| 54 | Oceania   | 1982 | 148.58000  | 18394850   | 37109.419680  | 590     |
| 55 | Oceania   | 1987 | 150.64000  | 19574415   | 40896.080320  | 590     |
| 56 | Oceania   | 1992 | 153.89000  | 20919651   | 41788.091770  | 590     |
| 57 | Oceania   | 1997 | 156.38000  | 22241430   | 48048.350340  | 590     |
| 58 | Oceania   | 2002 | 159.48000  | 23454829   | 53877.556080  | 590     |
| 59 | Oceania   | 2007 | 161.43900  | 24549947   | 59620.376550  | 590     |

In [104]:

```
fig2 = px.bar(df_new, x='pop', y='continent', color='continent', animation_frame="year",
              animation_group = 'continent', orientation='h', text_auto='.4s')
fig2.update_layout(showlegend=False, xaxis_range=[0,4000000000])
fig2.update_yaxes(categoryorder='total descending')
fig2.update_traces(textfont_size=12, textangle=0, textposition='outside',
                  cliponaxis=False)
fig2.show()
```



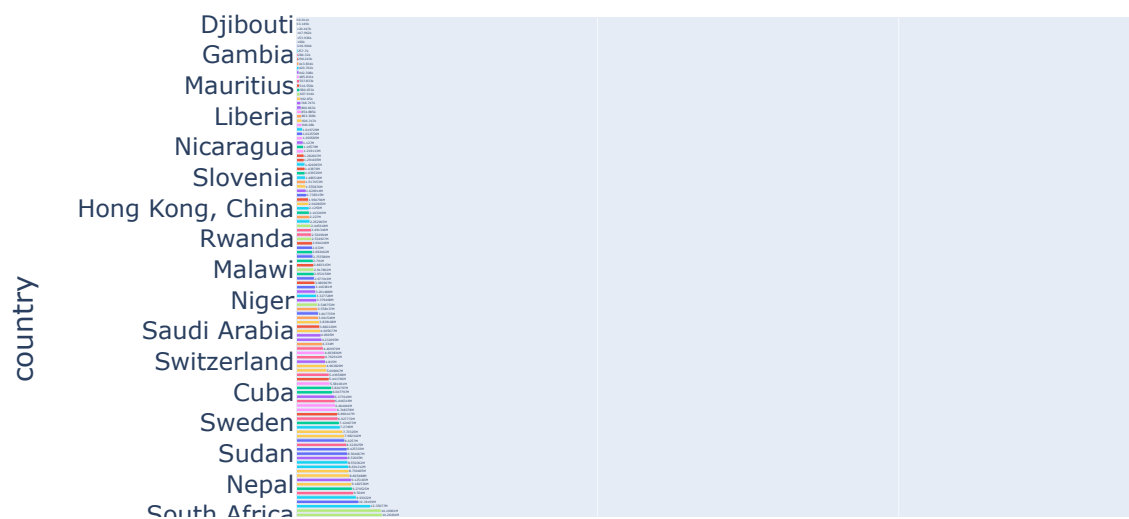
## Question 5:

Instead of the continents, let's look at individual countries. Create an animation that shows the population growth of the countries through the years



In [105]:

```
fig3 = px.bar(df, x='pop', y='country', color='country', animation_frame="year",
              animation_group = 'country', orientation='h', text_auto=True)
fig3.update_xaxes(range=(0,200000000))
fig3.update_yaxes(categoryorder='total descending')
fig3.update_traces(textfont_size=12, textangle=0, textposition='outside',
                   cliponaxis=False)
fig3.show()
```



## Question 6:

Clean up the country animation. Set the height size of the figure to 1000 to have a better view of the animation

In [106]:

```
fig3a = px.bar(df, x='pop', y='country', color='country', animation_frame="year",
               animation_group = 'country', height = 1000, orientation='h', text_auto=True)
fig3a.update_xaxes(range=(0,200000000))
fig3a.update_yaxes(categoryorder='total descending')
fig3a.update_traces(textfont_size=12, textangle=0, textposition='outside',
                    cliponaxis=False)
fig3a.show()
```



## Question 7:

Show only the top 10 countries in the animation

Hint: Use the axis limit to set this.

In [107]:

```
fig4 = px.bar(df, x='pop', y='country', color='country', animation_frame="year",
              animation_group = 'country', height = 1000, orientation='h', text_auto=True)
fig4.update_xaxes(range=(0,200000000))
fig4.update_yaxes(range=(131.5, 141.5))
fig4.update_traces(textfont_size=12, textangle=0, textposition='outside',
                  cliponaxis=False)
fig4.update_layout(yaxis={'categoryorder': 'total ascending'})
fig4.show()
```

