# Import data from https://tradingeconomics.com/matrix (https://tradingeconomics.com/matrix)

In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import datetime as dt

from bs4 import BeautifulSoup as bs
import requests
```

In [60]:
```
url="https://tradingeconomics.com/matrix"
```

# Import matrix data

In [3]:
```
df=pd.read_html(url)[0]
```

In [4]:
```
df.columns=df.columns.str.replace(" ","",regex=True)
df["Country"]=df["Country"].str.replace(" ","")
```

In [5]:
```
df
```

Out[5]:

| | Country | GDP | GDPYoY | GDPQoQ | InterestRate | InflationRate | JoblessRate | Gov.Budget | Debt/GDP | CurrentAccount | Population |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | UnitedStates | 20937 | 3.5 | -1.6 | 1.75 | 8.60 | 3.6 | -16.7 | 137.2 | -3.6 | 332.40 |
| **1** | China | 14723 | 4.8 | 1.3 | 3.70 | 2.10 | 5.9 | -3.7 | 66.8 | 1.8 | 1412.60 |
| **2** | EuroArea | 13011 | 5.4 | 0.6 | 0.00 | 8.10 | 6.6 | -5.1 | 95.6 | 3.0 | 342.41 |
| **3** | Japan | 4975 | 0.2 | -0.1 | -0.10 | 2.50 | 2.5 | -12.6 | 266.2 | 3.2 | 125.67 |
| **4** | Germany | 3846 | 3.8 | 0.2 | 0.00 | 7.60 | 5.3 | -3.7 | 69.3 | 7.0 | 83.17 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **176** | GuineaBissau | 1 | 5.8 | NaN | 4.00 | 6.70 | 3.2 | -7.8 | 36.5 | -8.6 | 1.96 |
| **177** | Comoros | 1 | 2.2 | NaN | 0.92 | 3.59 | 9.4 | -2.9 | 31.1 | -3.3 | 0.87 |
| **178** | Seychelles | 1 | 0.1 | NaN | 2.00 | 2.10 | 3.0 | -19.1 | 94.0 | -27.4 | 0.10 |
| **179** | SouthSudan | 1 | -6.0 | NaN | 12.00 | -4.29 | 13.9 | NaN | NaN | NaN | 11.19 |
| **180** | SaoTomeandPrincipe | 0 | 1.8 | NaN | 9.00 | 14.90 | 15.9 | -5.0 | 103.0 | -9.3 | 0.21 |

181 rows × 11 columns

# Extract detailed data for each country

### create a dictionary of countries and thier detailed data

In [6]:
```
page=requests.get(url,headers={'User-Agent': 'Mozilla/5.0'}).content
soup=bs(page,"html.parser")

dfs={}
countries=soup.select("div[class='container'] div[class='row'] table[id='matrix']       tr td:nth-child(1) a")
for country in countries[:10]:                                                  # select number of countries!!!
    title=country.text.replace(" ","")
    url2="https://tradingeconomics.com"+country["href"]
    soup=bs(requests.get(url2,headers={'User-Agent': 'Mozilla/5.0'}).content,"html.parser")
    tabs=soup.select("ul[class='nav nav-tabs'] li a")
    data=pd.DataFrame()
    for tab,i in zip(tabs,range(len(tabs)+1)):
        header=tab.text
        url3=url2+tab["href"]
        df=pd.read_html(url3)[i]
        df['Country']=title
        data=pd.concat([data,df],ignore_index=True)
    data=data.rename(columns={"Unnamed: 0":"KPI","Unnamed: 3":"ValueIn","Unnamed: 4":"Period"})
    data=data.drop_duplicates(keep="first")
    dfs[title]=data
```

# Plot data

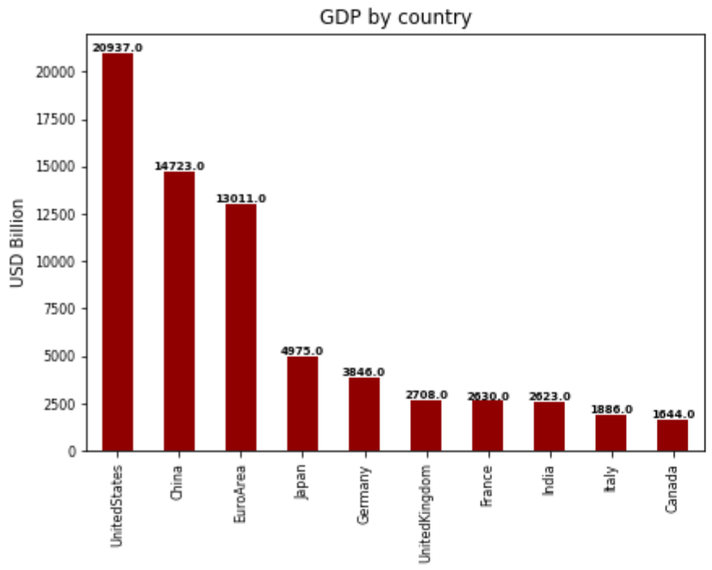
In [66]:
```
import matplotlib.ticker as mtick

plt.figure(figsize=(15,5))
colors=list(plt.get_cmap("hot")(np.linspace(0,0.7,len(dfs))))


for i,(key, value) in enumerate(dfs.items()):
    value=value[(value.KPI=="GDP per capita")]
    plt.bar(value.Country,value.Last,color=colors[i])
    plt.ylabel("Inflation rate")
    plt.title("Recent GDP Per Capita by country")
    plt.text(i,value.Last,str(value.Last.iloc[0])+" $",va="bottom",ha="center")
```

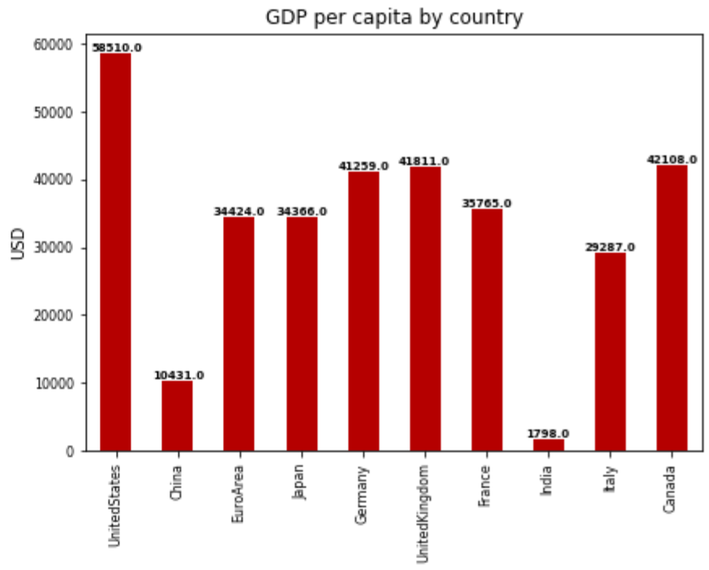

# Union every dataframe into one

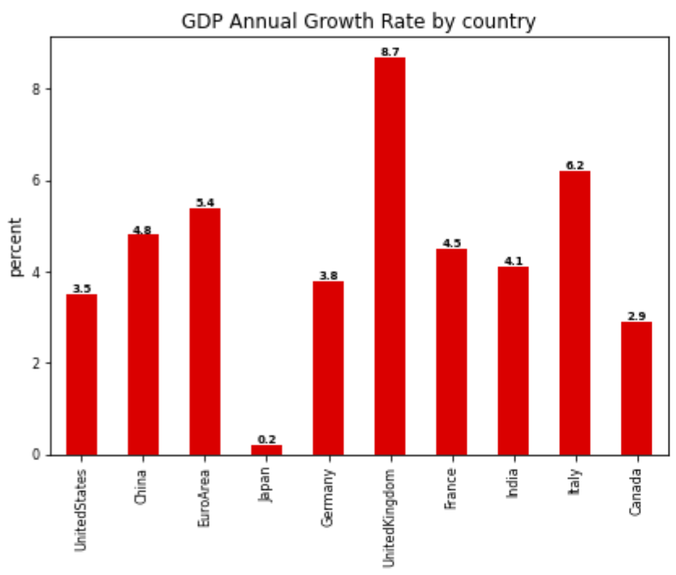
In [8]:
```
unioned=pd.DataFrame()
for key,value in dfs.items():
    unioned=pd.concat([unioned,value])
```

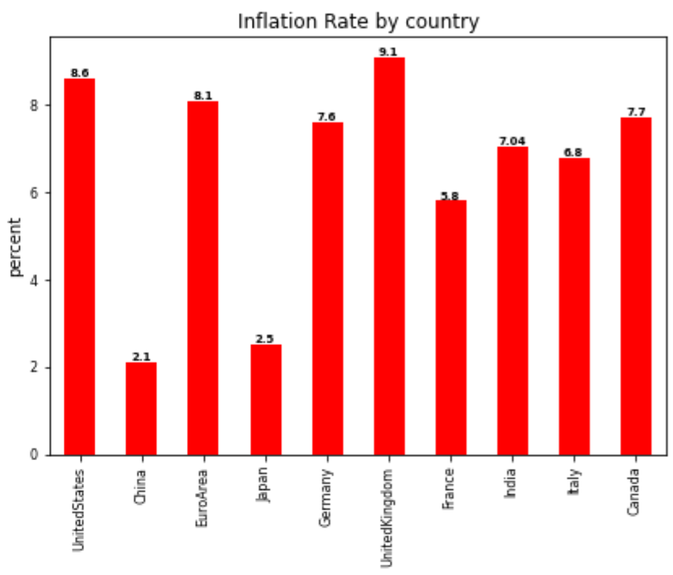
# Plot data

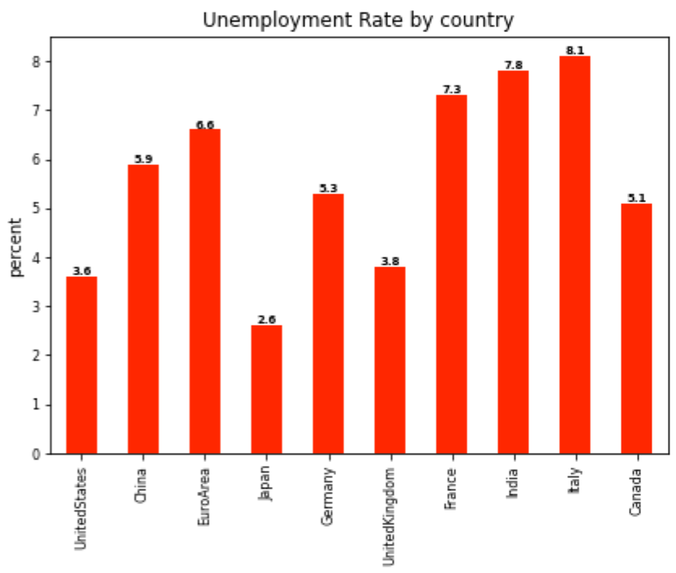
In [59]:
```
KPIs=["GDP","GDP per capita","GDP Annual Growth Rate","Inflation Rate","Unemployment Rate","Wage Growth",\
      "Social Security Rate","Coronavirus Vaccination Rate","Military Expenditure","Personal Savings"]
fig,axes=plt.subplots(5,2,figsize=(15,35))
colors=list(plt.get_cmap("hot")(np.linspace(0.2,0.7,len(KPIs))))

for KPI,ax,c in zip(KPIs,axes.ravel(),colors):
    filtered=unioned[unioned.KPI==KPI]
    filtered.plot(kind="bar",ax=ax,x="Country",y=["Last"],xlabel="",ylabel=filtered["ValueIn"].iloc[0],legend=False,fontsize=8,color=c)
    ax.set_title(KPI+" by country")
    plt.subplots_adjust(hspace=0.6)
    for i,y in enumerate(filtered.Last):
        ax.text(i,y,y,size=7,ha="center",va="bottom",fontweight="bold")
plt.show()
```

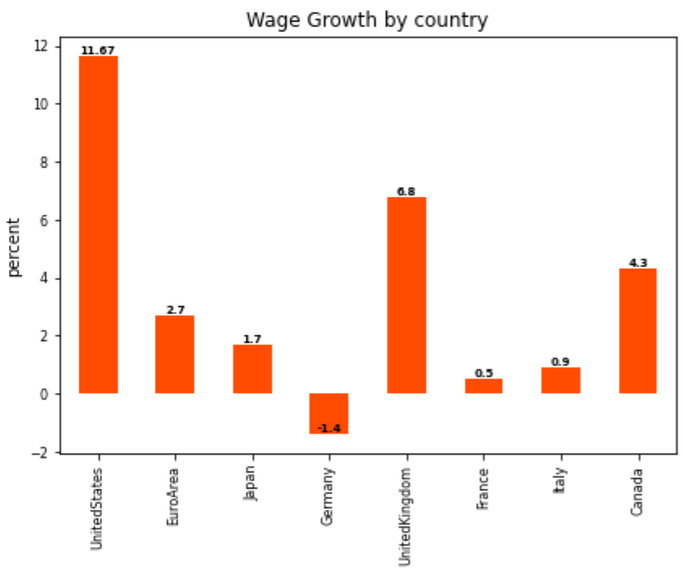

GDP by country
USD Billion
20937.0
14723.0
13011.0
4975.0
3846.0
2708.0
2630.0
2623.0
1886.0
1644.0
UnitedStates
China
EuroArea
Japan
Germany
UnitedKingdom
France
India
Italy
Canada

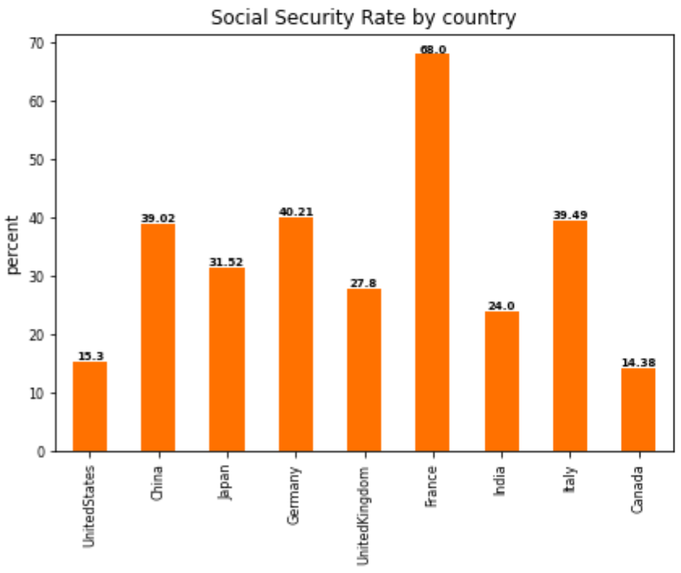

GDP per capita by country
USD
58510.0
10431.0
34424.0
34366.0
41259.0
41811.0
35765.0
1798.0
29287.0
42108.0
UnitedStates
China
EuroArea
Japan
Germany
UnitedKingdom
France
India
Italy
Canada

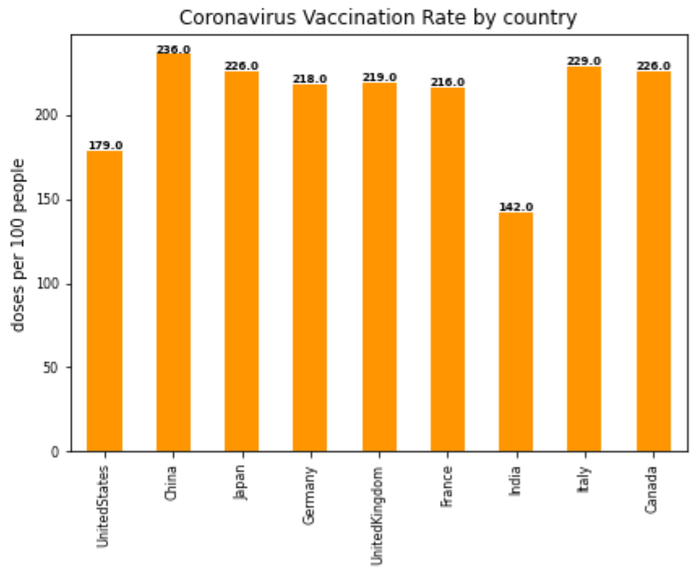

GDP Annual Growth Rate by country
percent
3.5
4.8
5.4
0.2
3.8
8.7
4.5
4.1
6.2
2.9
UnitedStates
China
EuroArea
Japan
Germany
UnitedKingdom
France
India
Italy
Canada

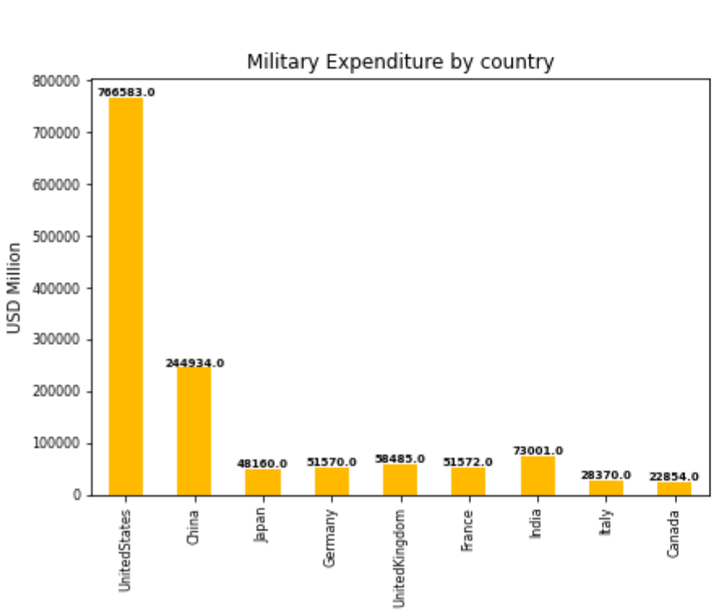

Inflation Rate by country
percent
8.6
2.1
8.1
2.5
7.6
9.1
5.8
7.04
6.8
7.7
UnitedStates
China
EuroArea
Japan
Germany
UnitedKingdom
France
India
Italy
Canada

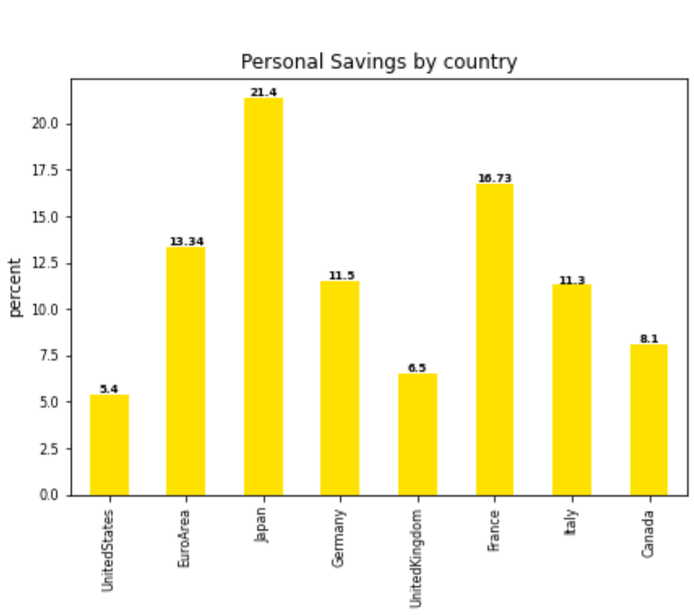

Unemployment Rate by country
percent
3.6
5.9
6.6
2.6
5.3
3.8
7.3
7.8
8.1
5.1
UnitedStates
China
EuroArea
Japan
Germany
UnitedKingdom
France
India
Italy
Canada


Wage Growth by country
percent
11.67
2.7
1.7
-1.4
6.8
0.5
0.9
4.3
UnitedStates
EuroArea
Japan
Germany
UnitedKingdom
France
Italy
Canada


Social Security Rate by country
percent
15.3
39.02
31.52
40.21
27.8
68.0
24.0
39.49
14.38
UnitedStates
China
Japan
Germany
UnitedKingdom
France
India
Italy
Canada


Coronavirus Vaccination Rate by country
doses per 100 people
179.0
236.0
226.0
218.0
219.0
216.0
142.0
229.0
226.0
UnitedStates
China
Japan
Germany
UnitedKingdom
France
India
Italy
Canada


Military Expenditure by country
USD Million
766583.0
244934.0
48160.0
51570.0
58485.0
51572.0
73001.0
28370.0
22854.0
UnitedStates
China
Japan
Germany
UnitedKingdom
France
India
Italy
Canada


Personal Savings by country
percent
5.4
13.34
21.4
11.5
6.5
16.73
11.3
8.1
UnitedStates
EuroArea
Japan
Germany
UnitedKingdom
France
Italy
Canada