```
# This Python 3 environment comes with many helpful analytics
libraries installed
# It is defined by the kaggle/python Docker image:
https://github.com/kaggle/docker-python
# For example, here's several helpful packages to load

import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)
from chart_studio import plotly
import cufflinks as cf
import seaborn as sns
import plotly.graph_objects as go
import plotly.express as px
import dash
from dash import Dash, dcc, html, Output, Input
import math

from plotly.offline import download_plotlyjs,init_notebook_mode, plot,
iplot
init_notebook_mode(connected=True)
cf.go_offline()

# Input data files are available in the read-only "../input/"
directory
# For example, running this (by clicking run or pressing Shift+Enter)
will list all files under the input directory

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))

# You can write up to 20GB to the current directory (/kaggle/working/)
that gets preserved as output when you create a version using "Save &
Run All"
# You can also write temporary files to /kaggle/temp/, but they won't
be saved outside of the current session
```

```
/kaggle/input/india-tourism-20142020/Top 10 State Visit.csv
/kaggle/input/india-tourism-20142020/Country Wise Visitors Ways.csv
/kaggle/input/india-tourism-20142020/Top10 State FFA Visit.csv
/kaggle/input/india-tourism-20142020/Month Wise FFE Dollar.csv
/kaggle/input/india-tourism-20142020/Country Wise Yearly VIsitors.csv
/kaggle/input/india-tourism-20142020/Country Wise Gender.csv
/kaggle/input/india-tourism-20142020/Country Wise Age Group.csv
/kaggle/input/india-tourism-20142020/Country Quater Wise Visitors.csv
/kaggle/input/india-tourism-20142020/General Data 2014-2020.csv
/kaggle/input/india-tourism-20142020/Top 10 Country FFA.csv
/kaggle/input/india-tourism-20142020/Month Wise FFA.csv
/kaggle/input/india-tourism-20142020/Country Wise Airport.csv
```

A study on foreign tourists entering India from 2014 to 2020 with the use of Python Pandas and with Plotly for the data visualization.

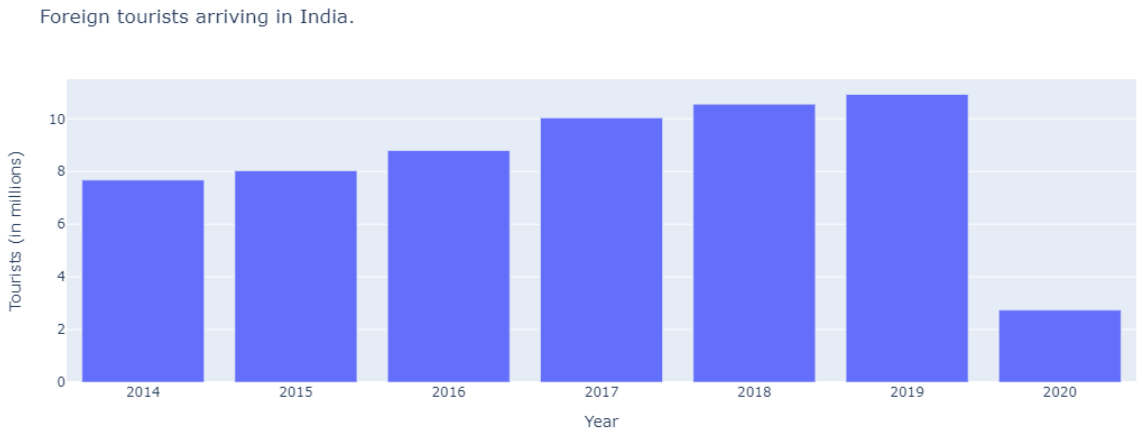

```
#reading the datasets
general = pd.read_csv("../input/india-tourism-20142020/General Data 2014-2020.csv")
top10 = pd.read_csv("../input/india-tourism-20142020/Top 10 Country FFA.csv")
top10states = pd.read_csv("../input/india-tourism-20142020/Top 10 State Visit.csv")

general.head()
```

```
   year  noftaii  noftaiiagr  noindfi  noindfiagr  nodtvasu
nodtvasuagr  \
0  2014     7.68        10.2    18.33        10.3   1290.00
12.9
1  2015     8.03         4.5    20.38        11.1   1432.00
11.6
2  2016     8.80         9.7    21.87         7.3   1613.60
12.7
3  2017    10.04        14.0    23.94         9.5   1652.49
2.3
4  2018    10.56         5.2    26.30         9.8   1854.90
11.9
```

```
   feeftit  feeftitagr  feeftust  ...  apfitr  apritragr  ipwiita
ipwirwta  \
0   123320        14.5    20.240  ...   377.0        4.7     0.68
41
1   135193         9.6    21.070  ...   418.9       -0.3     0.68
40
2   154146        14.0    22.920  ...   366.7        4.9     1.18
25
3   177874        15.4    27.310  ...   389.5        5.0     1.17
26
4   194892         9.6    28.585  ...   432.9        9.3     1.24
25

   ipwsiitr  ipwirwtr  ipaprita  ipaprirta  ipapritr  ipaprirtr
0      1.62        15      2.91         12      5.37          8
1      1.71        14      2.88         11      5.03          7
2      1.88        13      4.72          8      6.25          7
3      2.05        13      4.81          7      7.01          7
4      1.97        13      5.05          7      6.60          7

[5 rows x 27 columns]
```

How many tourists visited India each year from 2014 till 2020?

```
#noftaii = number of tourists arriving in India
#Plotting the graph with Plotly
px.bar(general, x="year", y="noftaii",
       labels={"year":"Year", "noftaii": "Tourists (in millions)"},
       title="Foreign tourists arriving in India.")
```



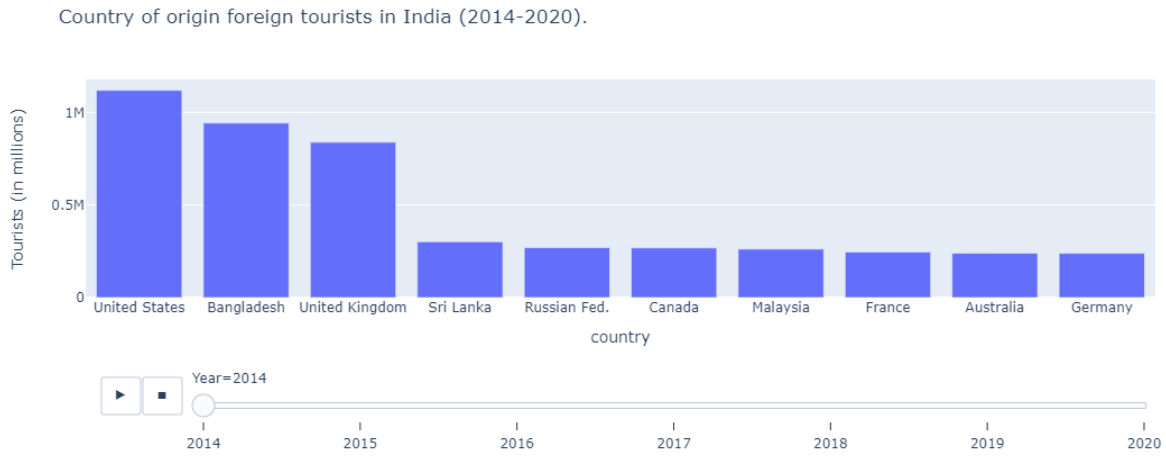
Where did these people came from?

```
#Reshaping the dataframe, so it is possible to use with Plotly
dfnew1 = pd.DataFrame(columns=["year", "country","visitors"])
for x in range(7):
    year = 2014 + x
    fourteen = top10[top10["year"] == year]
    visitors = [fourteen._get_value(0 + x, "top1_ftas"),
fourteen._get_value(0 + x, "top2_ftas"),fourteen._get_value(0 + x,
"top3_ftas"),fourteen._get_value(0 + x,
"top4_ftas"),fourteen._get_value(0 + x,
"top5_ftas"),fourteen._get_value(0 + x,
"top6_ftas"),fourteen._get_value(0 + x,
"top7_ftas"),fourteen._get_value(0 + x,
"top8_ftas"),fourteen._get_value(0 + x,
"top9_ftas"),fourteen._get_value(0 + x, "top10_ftas")]
    countries = [fourteen._get_value(0 + x, "top1_country"),
fourteen._get_value(0 + x, "top2_country"),fourteen._get_value(0 + x,
"top3_country"),fourteen._get_value(0 + x,
"top4_country"),fourteen._get_value(0 + x,
"top5_country"),fourteen._get_value(0 + x,
"top6_country"),fourteen._get_value(0 + x,
"top7_country"),fourteen._get_value(0 + x,
"top8_country"),fourteen._get_value(0 + x,
"top9_country"),fourteen._get_value(0 + x, "top10_country")]
    d1 = {"year": year, "country": countries, "visitors": visitors}
    df1 = pd.DataFrame(data=d1,columns=["year", "country","visitors"])
    dfnew1 = dfnew1.append(df1, ignore_index=True)

#Overview of the newly created dataframe.
#Ideal dataframe to use in Plotly to plot with an animation frame, see
next cell with code.
print(dfnew1)
```

```
    year         country visitors
0   2014   United States  1118983
1   2014      Bangladesh   942562
2   2014  United Kingdom   838860
3   2014       Sri Lanka   301601
4   2014    Russian Fed.   269832
..   ...             ...      ...
65  2020       Australia    86758
66  2020          France    74243
67  2020         Germany    72558
68  2020        Malaysia    69897
69  2020       Sri Lanka    68646

[70 rows x 3 columns]
```

```
#Plotting with Plotly. A graph with animation frame
fig1 = px.bar(dfnew1, x="country", y="visitors",
animation_frame="year",
```

```
      labels={"year":"Year", "visitors": "Tourists (in millions)"},
      title="Country of origin foreign tourists in India (2014-
2020).")
fig1.layout.updatemenus[0].buttons[0].args[1]["frame"]["duration"] =
3000

yranges = {2016:[0, 2500000]}

for f in fig1.frames:
    if int(f.name) in yranges.keys():
        f.layout.update(yaxis_range = yranges[int(f.name)])
fig1.show()
```



Which states in India were the most visited?

```
#reading the data
top10states.head()
```

```
     year  top1_state   top1_ftv     top2_state   top2_ftv
top3_state  \
0  2014.0  Tamil Nadu  327555233  Uttar Pradesh  182820108
Karnataka
1  2015.0  Tamil Nadu  333459047  Uttar Pradesh  204888457  Andhra
Pradesh
2  2016.0  Tamil Nadu  343812413  Uttar Pradesh  211707090  Andhra
Pradesh
3  2017.0  Tamil Nadu  385909376  Uttar Pradesh  233977619
Karnataka
4  2018.0  Tamil Nadu  385909376  Uttar Pradesh  285079848
Karnataka

    top3_ftv      top4_state   top4_ftv      top5_state  ...
top6_state  \
0  118283220     Maharashtra   94127124  Andhra Pradesh  ...
```

```
Telengana
1  121591054       Karnataka  119863942     Maharashtra  ...
Telengana
2  153163352  Madhya Pradesh  150490339       Karnataka  ...
Maharashtra
3  179980191  Andhra Pradesh  165433898     Maharashtra  ...
Telengana
4  214306456  Andhra Pradesh  194767874     Maharashtra  ...
Telengana

    top6_ftv      top7_state  top7_ftv      top8_state  top8_ftv
top9_state  \
0   72399113  Madhya Pradesh  63614525     West Bengal  49029590
Jharkhand
1   94516316  Madhya Pradesh  77975738     West Bengal  70193450
Gujarat
2  116515801       Telengana  95160830     West Bengal  74460250
Gujarat
3   85266596     West Bengal  79687645  Madhya Pradesh  78038522
Gujarat
4   92878329     West Bengal  85657365  Madhya Pradesh  83969799
Gujarat

   top9_ftv  top10_state top10_ftv
0  33427144    Rajasthan  33076491
1  36288463    Rajasthan  35187573
2  42252909    Rajasthan  41495115
3  48343121    Rajasthan  45916573
4  54369873    Rajasthan  50235643

[5 rows x 21 columns]
```

```
#Reshaping the dataframe, so it is possible to use with Plotly
dfnew2 = pd.DataFrame(columns=["year","guests","states"])
for x in range(7):
    year = 2014 + x
    setstate = top10states[top10states["year"] == year]
    guests = [setstate._get_value(0 + x, "top1_ftv"),
setstate._get_value(0 + x, "top2_ftv"), setstate._get_value(0 + x,
"top3_ftv"), setstate._get_value(0 + x,
"top4_ftv"),setstate._get_value(0 + x, "top5_ftv"),
setstate._get_value(0 + x, "top6_ftv"), setstate._get_value(0 + x,
"top7_ftv"), setstate._get_value(0 + x, "top8_ftv"),
setstate._get_value(0 + x, "top9_ftv"), setstate._get_value(0 + x,
"top10_ftv")]
    states = [setstate._get_value(0 + x, "top1_state"),
setstate._get_value(0 + x, "top2_state"), setstate._get_value(0 + x,
"top3_state"), setstate._get_value(0 + x,
"top4_state"),setstate._get_value(0 + x, "top5_state"),
setstate._get_value(0 + x, "top6_state"), setstate._get_value(0 + x,
```

```
"top7_state"), setstate._get_value(0 + x, "top8_state"),
setstate._get_value(0 + x, "top9_state"), setstate._get_value(0 + x,
"top10_state")]
    d2 = {"year": year, "guests": guests, "states": states}
    df2 = pd.DataFrame(data=d2, columns=["year","guests","states"])
    dfnew2 = dfnew2.append(df2, ignore_index=True)

#Overview of the newly created dataframe.
#Ideal dataframe to use in Plotly to plot with an animation frame, see
next cell with code.
print(dfnew2)
```

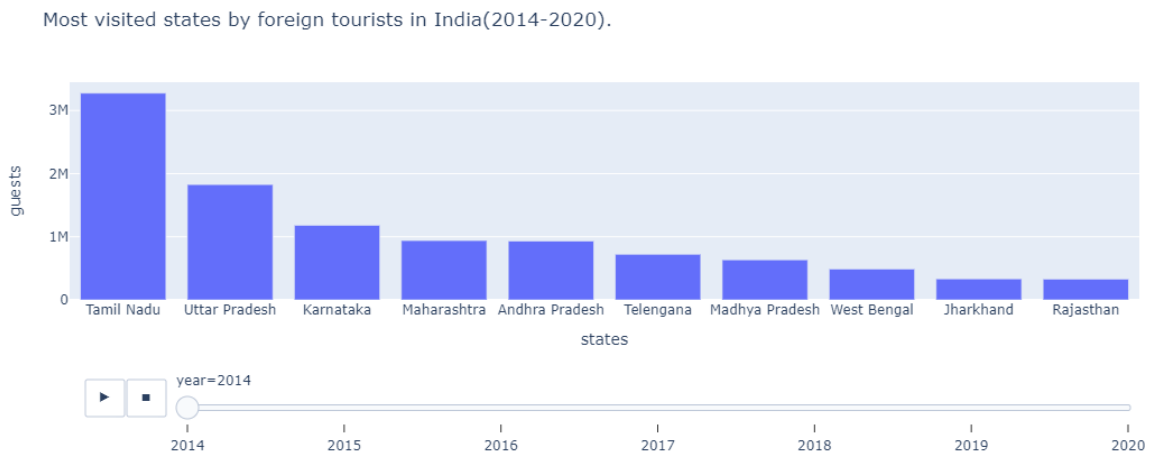
```
    year      guests          states
0   2014  3275552.33      Tamil Nadu
1   2014  1828201.08   Uttar Pradesh
2   2014   1182832.2       Karnataka
3   2014   941271.24     Maharashtra
4   2014   933069.74  Andhra Pradesh
..   ...         ...             ...
65  2020   392345.91     Maharashtra
66  2020   288417.32     West Bengal
67  2020   235196.32  Madhya Pradesh
68  2020   194645.17         Gujarat
69  2020   166921.97          Punjab

[70 rows x 3 columns]
```

```
#There was a little mistake in the amount of guests visiting India. It
is 100 times too much.
#So I divide this by 100
dfnew2["guests"] = dfnew2["guests"] / 100
print(dfnew2.head(1))
print(dfnew2.tail(1))
```

```
   year      guests      states
0  2014  3275552.33  Tamil Nadu
    year     guests  states
69  2020  166921.97  Punjab
```

```
#plotting the graph
fig2 = px.bar(dfnew2, x="states", y="guests", animation_frame="year",
       labels={"states":"states", "visitors": "Tourists (in
millions)"},
       title="Most visited states by foreign tourists in India(2014-
2020).")
fig2.layout.updatemenus[0].buttons[0].args[1]["frame"]["duration"] =
3000

yranges = {2018:[0, 6000000]}

for f in fig2.frames:
```

```
    if int(f.name) in yranges.keys():
        f.layout.update(yaxis_range = yranges[int(f.name)])


fig2.show()
```



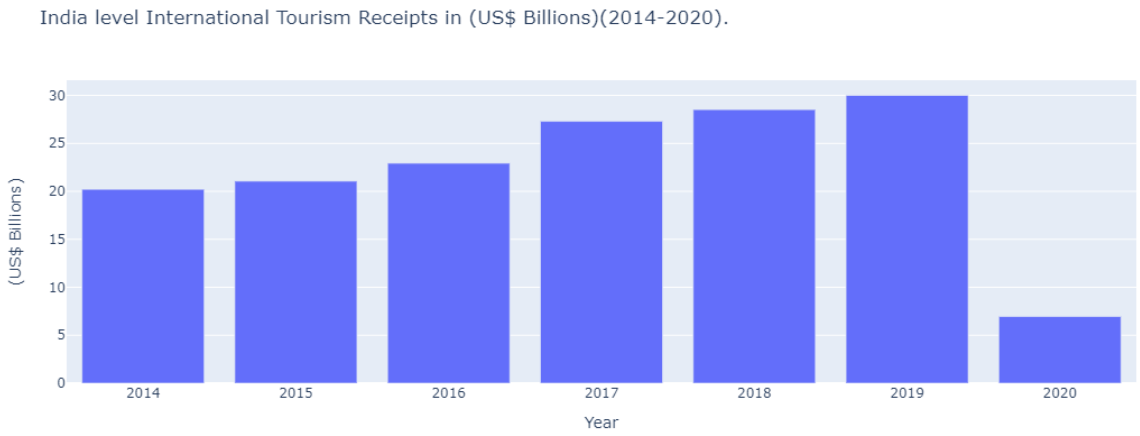
Let's plot the share of arrivals in India, with the arrivals in the rest of the world

```
fig4 = px.bar(general, x="year", y="ipwiita",
       labels={"year":"Year", "ipwiita": "(%)"},
       title="India’s Position in World, Share of India in
International Tourist Arrivals(in %)(2014-2020).")
fig4.show()
```

Let's see how much money these tourists generate each year and how that is linked to the amount of visiting tourists on only the foreign exchange earnings in US$

```
#Plotting the scattergraph with Plotly
general["stryear"] = general["year"].astype("object")
fig3 = px.scatter(general, x="feeftust", y="noftaii",color="stryear",
       labels={"feeftust":"Estimated Foreign Exchange Earnings from
Tourism in US$ terms in Billions", "noftaii": "Tourists (in
millions)"},
       title="Foreign Exchange Earnings from Tourism in US($) terms in
Billions (2014-2020).",
       hover_data=["year"])

#customizing the scatter plot
fig3.update_traces(marker=dict(size=12,
                               line=dict(width=2,
                                         color='DarkSlateGrey')),
                   selector=dict(mode='markers'))
fig3.update_layout(showlegend=True)
fig3.show()
```


```
#Creating new column to get the absolute number of India level
International Tourism Receipts in US$ Billion
#world level International Tourism Receipts in US$ Billion * Share of
India in International Tourism Receipts (US$ terms) (in %)
general["spendinIndia"] = (general["witr"] * general["ipwsiitr"]) /
100

fig5 = px.bar(general, x="year", y="spendinIndia",
       labels={"year":"Year", "spendinIndia": "(US$ Billions)"},
       title="India level International Tourism Receipts in (US$
Billions)(2014-2020).")
fig5.show()
```



The amount of income of money out of tourism and the arriving tourists were rising till 2019. The corona crisis led to a decrease in both.