# Importing Necessary Libraries

```
import pandas as pd
import numpy as np
```

# Importing Dataset

```
domestic = pd.read_csv("/content/domestic_visitors_2016.csv")
```

```
df_2017 = pd.read_csv("/content/domestic_visitors_2017.csv")
```

```
df_2018 = pd.read_csv("/content/domestic_visitors_2018.csv")
```

```
df_2019 = pd.read_csv("/content/domestic_visitors_2019.csv")
```

```
foreign = pd.read_csv("/content/foreign_visitors_2016.csv")
```

```
df_2017_f = pd.read_csv("/content/foreign_visitors_2017.csv")
```

```
df_2018_f = pd.read_csv("/content/foreign_visitors_2018.csv")
```

```
df_2019_f = pd.read_csv("/content/foreign_visitors_2019.csv")
```

# Data Merging : Domestic

```
domestic.shape
```

```
(372, 5)
```

```
domestic = domestic.append(df_2017)
```

```
<ipython-input-438-4e88eeb19380>:1: FutureWarning: The frame.append method is deprecated and will be removed from pandas ir
  domestic = domestic.append(df_2017)
```

```
domestic = domestic.append(df_2018)
```

```
<ipython-input-439-bac7e35707ac>:1: FutureWarning: The frame.append method is deprecated and will be removed from pandas ir
  domestic = domestic.append(df_2018)
```

```
domestic = domestic.append(df_2019)
```

```
<ipython-input-440-fb48d6df8b5f>:1: FutureWarning: The frame.append method is deprecated and will be removed from pandas ir
  domestic = domestic.append(df_2019)
```

```
domestic
```

| | district | date | month | year | visitors |
|---|---|---|---|---|---|
| 0 | Adilabad | 01-01-2016 | January | 2016 | 792136 |
| 1 | Adilabad | 01-02-2016 | February | 2016 | 937820 |
| 2 | Adilabad | 01-03-2016 | March | 2016 | 582946 |
| 3 | Adilabad | 01-04-2016 | April | 2016 | 341948 |
| 4 | Adilabad | 01-05-2016 | May | 2016 | 252887 |
| 5 | Adilabad | 01-06-2016 | June | 2016 | 368237 |
| 6 | Adilabad | 01-07-2016 | July | 2016 | 447562 |
| 7 | Adilabad | 01-08-2016 | August | 2016 | 614285 |
| 8 | Adilabad | 01-09-2016 | September | 2016 | 491279 |
| 9 | Adilabad | 01-10-2016 | October | 2016 | 94184 |
| 10 | Adilabad | 01-11-2016 | November | 2016 | 99148 |
| 11 | Adilabad | 01-12-2016 | December | 2016 | 53125 |
| 12 | Bhadradri Kothagudem | 01-01-2016 | January | 2016 | |
| 13 | Bhadradri Kothagudem | 01-02-2016 | February | 2016 | |
| 14 | Bhadradri Kothagudem | 01-03-2016 | March | 2016 | |
| 15 | Bhadradri Kothagudem | 01-04-2016 | April | 2016 | |
| 16 | Bhadradri Kothagudem | 01-05-2016 | May | 2016 | |
| 17 | Bhadradri Kothagudem | 01-06-2016 | June | 2016 | |
| 18 | Bhadradri Kothagudem | 01-07-2016 | July | 2016 | |
| 19 | Bhadradri Kothagudem | 01-08-2016 | August | 2016 | |
| 20 | Bhadradri Kothagudem | 01-09-2016 | September | 2016 | |
| 21 | Bhadradri Kothagudem | 01-10-2016 | October | 2016 | 310133 |
| 22 | Bhadradri Kothagudem | 01-11-2016 | November | 2016 | 252127 |
| 23 | Bhadradri Kothagudem | 01-12-2016 | December | 2016 | 326770 |
| 24 | Hyderabad | 01-01-2016 | January | 2016 | 1122510 |
| 25 | Hyderabad | 01-02-2016 | February | 2016 | 778748 |
| 26 | Hyderabad | 01-03-2016 | March | 2016 | 1017794 |
| 27 | Hyderabad | 01-04-2016 | April | 2016 | 1127738 |
| 28 | Hyderabad | 01-05-2016 | May | 2016 | 1287181 |
| 29 | Hyderabad | 01-06-2016 | June | 2016 | 12032661 |
| 30 | Hyderabad | 01-07-2016 | July | 2016 | 1096754 |
| 31 | Hyderabad | 01-08-2016 | August | 2016 | 1061137 |
| 32 | Hyderabad | 01-09-2016 | September | 2016 | 832987 |
| 33 | Hyderabad | 01-10-2016 | October | 2016 | 901960 |
| 34 | Hyderabad | 01-11-2016 | November | 2016 | 909733 |
| 35 | Hyderabad | 01-12-2016 | December | 2016 | 1225502 |
| 36 | Jagtial | 01-01-2016 | January | 2016 | |
| 37 | Jagtial | 01-02-2016 | February | 2016 | |
| 38 | Jagtial | 01-03-2016 | March | 2016 | |
| 39 | Jagtial | 01-04-2016 | April | 2016 | |
| 40 | Jagtial | 01-05-2016 | May | 2016 | |
| 41 | Jagtial | 01-06-2016 | June | 2016 | |
| 42 | Jagtial | 01-07-2016 | July | 2016 | |
| 43 | Jagtial | 01-08-2016 | August | 2016 | |
| 44 | Jagtial | 01-09-2016 | September | 2016 | |
| 45 | Jagtial | 01-10-2016 | October | 2016 | 201249 |
| 46 | Jagtial | 01-11-2016 | November | 2016 | 214534 |

```
domestic.to_csv("domestic_visitors.csv")
```

```
48                Jangaon  01-01-2016     January  2016
```

## Data Merging : Foreign

```
51                Jangaon  01-04-2016       April  2016
```

```
foreign.shape
```

```
(372, 5)
```

```
foreign = foreign.append(df_2017_f)
```

```
<ipython-input-444-2cce03693c9b>:1: FutureWarning: The frame.append method is deprecated and will be removed from pandas ir
  foreign = foreign.append(df_2017_f)
```

```
foreign = foreign.append(df_2018_f)
```

```
<ipython-input-445-cd88cba9f968>:1: FutureWarning: The frame.append method is deprecated and will be removed from pandas ir
  foreign = foreign.append(df_2018_f)
```

```
foreign = foreign.append(df_2019_f)
```

```
<ipython-input-446-1c66b0851cc2>:1: FutureWarning: The frame.append method is deprecated and will be removed from pandas ir
  foreign = foreign.append(df_2019_f)
```

```
foreign.to_csv("foreign_visitors.csv")
```

## Data Cleaning : Domestic

```
70  Javashankar Bhoopalpally  01-11-2016  November  2016  81580
```

```
domestic.isnull().sum()
```

```
district     0
date         0
month        0
year         0
visitors    30
dtype: int64
```

```
domestic.replace([" ",np.nan], 0, inplace=True)
```

```
77          Jogulamba Gadwal  01-06-2016      June  2016
```

```
domestic
```

| | district | date | month | year | visitors |
|---|---|---|---|---|---|
| 0 | Adilabad | 01-01-2016 | January | 2016 | 792136 |
| 1 | Adilabad | 01-02-2016 | February | 2016 | 937820 |
| 2 | Adilabad | 01-03-2016 | March | 2016 | 582946 |
| 3 | Adilabad | 01-04-2016 | April | 2016 | 341948 |
| 4 | Adilabad | 01-05-2016 | May | 2016 | 252887 |
| 5 | Adilabad | 01-06-2016 | June | 2016 | 368237 |
| 6 | Adilabad | 01-07-2016 | July | 2016 | 447562 |
| 7 | Adilabad | 01-08-2016 | August | 2016 | 614285 |
| 8 | Adilabad | 01-09-2016 | September | 2016 | 491279 |
| 9 | Adilabad | 01-10-2016 | October | 2016 | 94184 |
| 10 | Adilabad | 01-11-2016 | November | 2016 | 99148 |
| 11 | Adilabad | 01-12-2016 | December | 2016 | 53125 |
| 12 | Bhadradri Kothagudem | 01-01-2016 | January | 2016 | 0 |
| 13 | Bhadradri Kothagudem | 01-02-2016 | February | 2016 | 0 |
| 14 | Bhadradri Kothagudem | 01-03-2016 | March | 2016 | 0 |
| 15 | Bhadradri Kothagudem | 01-04-2016 | April | 2016 | 0 |
| 16 | Bhadradri Kothagudem | 01-05-2016 | May | 2016 | 0 |
| 17 | Bhadradri Kothagudem | 01-06-2016 | June | 2016 | 0 |
| 18 | Bhadradri Kothagudem | 01-07-2016 | July | 2016 | 0 |
| 19 | Bhadradri Kothagudem | 01-08-2016 | August | 2016 | 0 |
| 20 | Bhadradri Kothagudem | 01-09-2016 | September | 2016 | 0 |
| 21 | Bhadradri Kothagudem | 01-10-2016 | October | 2016 | 310133 |
| 22 | Bhadradri Kothagudem | 01-11-2016 | November | 2016 | 252127 |
| 23 | Bhadradri Kothagudem | 01-12-2016 | December | 2016 | 326770 |
| 24 | Hyderabad | 01-01-2016 | January | 2016 | 1122510 |
| 25 | Hyderabad | 01-02-2016 | February | 2016 | 778748 |
| 26 | Hyderabad | 01-03-2016 | March | 2016 | 1017794 |
| 27 | Hyderabad | 01-04-2016 | April | 2016 | 1127738 |
| 28 | Hyderabad | 01-05-2016 | May | 2016 | 1287181 |
| 29 | Hyderabad | 01-06-2016 | June | 2016 | 12032661 |
| 30 | Hyderabad | 01-07-2016 | July | 2016 | 1096754 |
| 31 | Hyderabad | 01-08-2016 | August | 2016 | 1061137 |
| 32 | Hyderabad | 01-09-2016 | September | 2016 | 832987 |
| 33 | Hyderabad | 01-10-2016 | October | 2016 | 901960 |
| 34 | Hyderabad | 01-11-2016 | November | 2016 | 909733 |
| 35 | Hyderabad | 01-12-2016 | December | 2016 | 1225502 |
| 36 | Jagtial | 01-01-2016 | January | 2016 | 0 |
| 37 | Jagtial | 01-02-2016 | February | 2016 | 0 |
| 38 | Jagtial | 01-03-2016 | March | 2016 | 0 |
| 39 | Jagtial | 01-04-2016 | April | 2016 | 0 |
| 40 | Jagtial | 01-05-2016 | May | 2016 | 0 |
| 41 | Jagtial | 01-06-2016 | June | 2016 | 0 |
| 42 | Jagtial | 01-07-2016 | July | 2016 | 0 |
| 43 | Jagtial | 01-08-2016 | August | 2016 | 0 |
| 44 | Jagtial | 01-09-2016 | September | 2016 | 0 |
| 45 | Jagtial | 01-10-2016 | October | 2016 | 201249 |
| 46 | Jagtial | 01-11-2016 | November | 2016 | 214534 |

```
domestic.dtypes
```

```
district    object
date        object
month       object
year         int64
visitors    object
dtype: object
```

```
domestic["visitors"] = domestic.visitors.astype("int64")
```

```
domestic = domestic.drop_duplicates()
```

```
domestic.shape
```

```
(1512, 5)
```

# Data Cleaning : Foreigners

```
foreign.isnull().sum()
```

```
district    0
date        0
month       0
year        0
visitors    0
dtype: int64
```

```
foreign["visitors"] = foreign["visitors"].replace(" ",0)
```

```
foreign["visitors"] = foreign["visitors"].astype("int64")
```

```
df = pd.DataFrame({"foreign":foreign.groupby("district")["visitors"].sum()})
```

```
df["domestic"]=domestic.groupby("district")["visitors"].sum()
```

```
df.isnull().sum()
```

```
foreign     0
domestic    1
dtype: int64
```

```
df["domestic"] = df["domestic"].replace(np.nan, 0)
```

```
domestic.to_csv("domestic_visitors.csv")
```

```
foreign.to_csv("foreign_visitors.csv")
```

```
domestic.shape
```

```
(1512, 5)
```

# #1 Top_10 Districts

```
combined = domestic.append(foreign)
```

```
<ipython-input-465-470046728864>:1: FutureWarning: The frame.append method is deprecated and will be removed from pandas ir
  combined = domestic.append(foreign)
```

```
domestic.shape
```

```
(1512, 5)
```

```
foreign.shape
```

```
(1512, 5)
```

```
combined.shape
```

```
(3024, 5)
```

```
combined.groupby("district")["visitors"].sum().sort_values(ascending=True).nlargest(10)
```

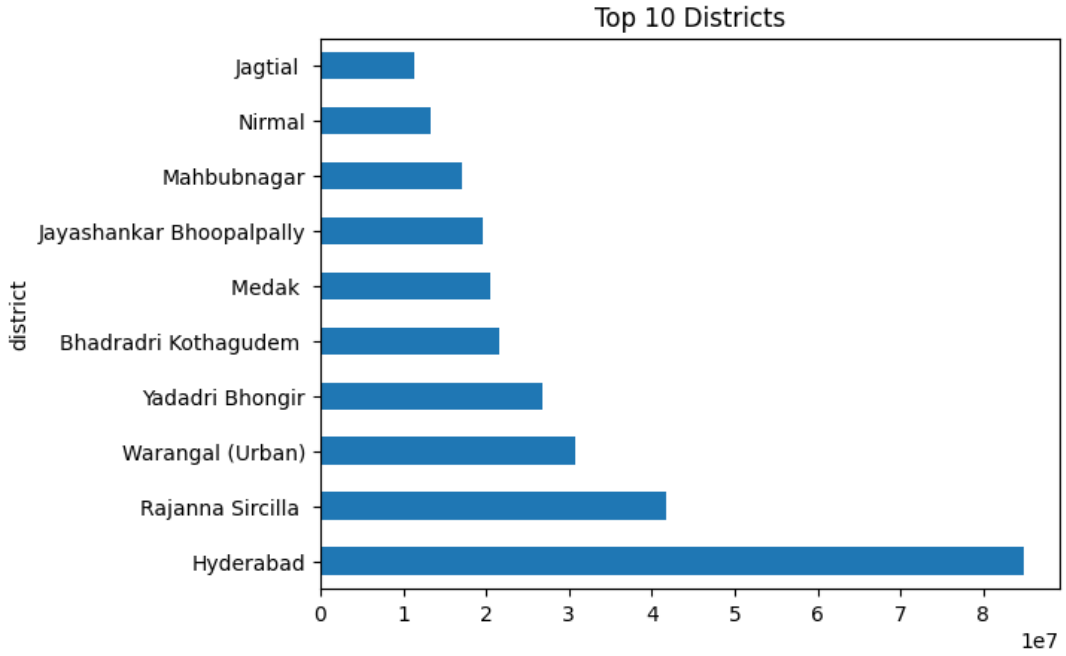
```
district
Hyderabad                   84945858
Rajanna Sircilla            41763276
Warangal (Urban)            30735424
Yadadri Bhongir             26893080
Bhadradri Kothagudem        21600962
Medak                       20542639
Jayashankar Bhoopalpally    19634117
Mahbubnagar                 17182400
Nirmal                      13315798
Jagtial                     11303514
Name: visitors, dtype: int64
```

```
combined.to_csv("combined.csv")
```

110 Khammam 01-03-2016 March 2016 458527

```
combined.groupby("district")["visitors"].sum().sort_values(ascending=True).nlargest(10).plot(kind="barh", title="Top 10 District
```

```
<Axes: title={'center': 'Top 10 Districts'}, ylabel='district'>
```

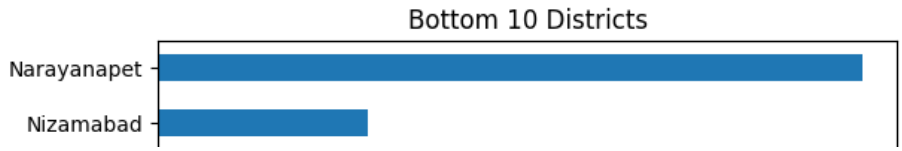



127 Komaram Bheem Asifabad 01-08-2016 August 2016 0

## #1 Bottom_10 Districts

```
combined.groupby("district")["visitors"].sum().sort_values(ascending=True).nsmallest(10).plot(kind="barh", title="Bottom 10 Dist
```

```
<Axes: title={'center': 'Bottom 10 Districts'}, ylabel='district'>
```




```
combined.groupby("district")["visitors"].sum().nsmallest(10)
```

```
district
Medchal                       0
Ranga Reddy                   0
Suryapet                      0
Vikarabad                     0
Narayanpet                    5
Kamareddy                  1773
Peddapalli                56977
Komaram Bheem Asifabad    92734
Nizamabad                116152
Narayanapet              389250
Name: visitors, dtype: int64
```

## #2 Domestic Top_3 CAGR

```
158              Mancherial  01-03-2016      March  2016          0
```

```
pd.set_option("display.max_rows", None)


domestic.groupby(["year","district"])["visitors"].sum()
```

```
Wanaparthy                298639
Warangal (Rural)          353500
Warangal (Urban)         1795230
Yadadri Bhongir          4489374
Name: visitors, dtype: int64
```

```
districts=domestic["district"].unique()
```

```
districts
```

```
array(['Adilabad', 'Bhadradri Kothagudem ', 'Hyderabad', 'Jagtial ',
       'Jangaon ', 'Jayashankar Bhoopalpally', 'Jogulamba Gadwal ',
       'Kamareddy ', 'Karimnagar ', 'Khammam', 'Komaram Bheem Asifabad',
       'Mahabubabad ', 'Mahbubnagar', 'Mancherial', 'Medak ', 'Medchal ',
       'Nagarkurnool ', 'Nalgonda', 'Nirmal', 'Nizamabad', 'Peddapalli',
       'Rajanna Sircilla ', 'Ranga Reddy', 'Sangareddy ', 'Siddipet',
       'Suryapet', 'Vikarabad', 'Wanaparthy ', 'Warangal (Rural)',
       'Warangal (Urban)', 'Yadadri Bhongir', 'Mulugu', 'Narayanapet'],
      dtype=object)
```

```
dom = pd.DataFrame({"district":districts})
```

```
204                Nalgonda  01-01-2016     January  2016     566515
```

```
domo_2016=[]
for i in districts:
    domestic_2016 = domestic[domestic["year"]==2016]
    domo = domestic_2016[domestic_2016["district"]==i].visitors.sum()
    domo_2016.append(domo)
dom["2016"]=domo_2016
```

```
domo_2019=[]
for i in districts:
    domestic_2019 = domestic[domestic["year"]==2019]
    domo = domestic_2019[domestic_2019["district"]==i].visitors.sum()
    domo_2019.append(domo)
dom["2019"]=domo_2019
```

```
dom.head()
```

| | district | 2016 | 2019 |
|---|---|---|---|
| 0 | Adilabad | 5075557 | 775895 |
| 1 | Bhadradri Kothagudem | 889030 | 12817737 |
| 2 | Hyderabad | 23394705 | 13802362 |
| 3 | Jagtial | 623077 | 3086115 |
| 4 | Jangaon | 40660 | 328890 |

```
cagr=[]
for i in range(len(districts)):
    fv = dom.loc[i,"2019"]
    iv = dom.loc[i,"2016"]
    cagrr = (((fv/iv)**(1/3))-1)
    cagr.append(cagrr)
```

```
<ipython-input-482-b652aae79c70>:5: RuntimeWarning: divide by zero encountered in long_scalars
  cagrr = (((fv/iv)**(1/3))-1)
<ipython-input-482-b652aae79c70>:5: RuntimeWarning: invalid value encountered in long_scalars
  cagrr = (((fv/iv)**(1/3))-1)
```

```
229              Nizamabad  01-02-2016    February  2016        869
```

```
dom["CAGR"]=cagr
```

```
dom = dom.replace([np.inf,np.nan],0)
```

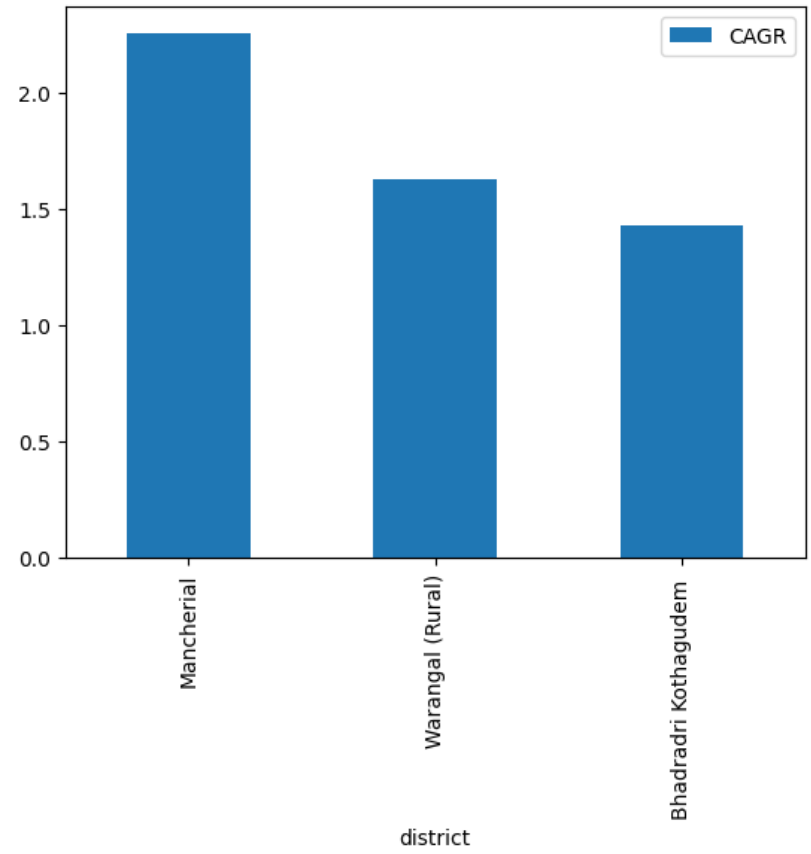
```
dom.head()
```

| | district | 2016 | 2019 | CAGR |
|---|---|---|---|---|
| 0 | Adilabad | 5075557 | 775895 | -0.465305 |

```
dom_max = dom.sort_values(by="CAGR", ascending=False).head(3)
dom_max = dom_max.reset_index()
dom_max.drop("index", axis=1, inplace=True)
```

```
dom_max.head().plot("district", "CAGR", kind="bar")
```

```
<Axes: xlabel='district'>
```




## #3 Domestic Bottom_3 CAGR

```
dom_min = dom.sort_values(by="CAGR", ascending=True).head(3)
dom_min = dom_min.reset_index()
dom_min.drop("index", axis=1, inplace=True)
```

```
dom_min.head().plot("district", "CAGR", kind="bar")
```

```
<Axes: xlabel='district'>
```


```
dom.to_csv("cagr.csv")
```

## #2 Foreign Top_3 CAGR

```
foreign.groupby(["year","district"])["visitors"].sum()
```

```
          Kamareddy                      0
          Karimnagar                     0
          Khammam                        0
          Komaram Bheem Asifabad         0
          Mahabubabad                    0
          Mahbubnagar                  454
          Mancherial                     0
          Medak                          0
          Medchal                        0
          Nagarkurnool                 222
          Nalgonda                       0
          Nirmal                         2
          Nizamabad                      2
          Peddapalli                     0
          Rajanna Sircilla               0
          Ranga Reddy                    0
          Sangareddy                     0
          Siddipet                       0
          Suryapet                       0
          Vikarabad                      0
          Wanaparthy                     0
          Warangal (Rural)               0
          Warangal (Urban)            1842
          Yadadri Bhongir                0
    2019  Adilabad                       6
          Bhadradri Kothagudem           0
          Hyderabad                 319300
          Jagtial                        0
          Jangaon                        0
          Jayashankar Bhoopalpally      45
          Jogulamba Gadwal             295
          Kamareddy                      0
          Karimnagar                     0
          Khammam                        0
          Komaram Bheem Asifabad         0
          Mahabubabad                    0
          Mahbubnagar                  440
          Mancherial                    10
          Medak                          0
          Medchal                        0
          Mulugu                       575
          Nagarkurnool                 199
          Nalgonda                       0
          Narayanpet                     5
          Nirmal                         0
          Nizamabad                      1
          Peddapalli                     0
          Rajanna Sircilla               0
          Ranga Reddy                    0
          Sangareddy                     0
          Siddipet                       0
          Suryapet                       0
          Vikarabad                      0
          Wanaparthy                     0
          Warangal (Rural)               0
          Warangal (Urban)            2450
          Yadadri Bhongir                0
    Name: visitors, dtype: int64
```

```
frgn = pd.DataFrame({"district":districts})
```

```
domo_2016=[]
for i in districts:
    domestic_2016 = foreign[foreign["year"]==2016]
    domo = domestic_2016[domestic_2016["district"]==i].visitors.sum()
    domo_2016.append(domo)
frgn["2016"]=domo_2016
```

```
domo_2019=[]
for i in districts:
    domestic_2019 = foreign[foreign["year"]==2019]
    domo = domestic_2019[domestic_2019["district"]==i].visitors.sum()
    domo_2019.append(domo)
frgn["2019"]=domo_2019
```

```
frgn.head()
```

| | district | 2016 | 2019 |
|---|---|---|---|
| 0 | Adilabad | 10 | 6 |
| 1 | Bhadradri Kothagudem | 0 | 0 |
| 2 | Hyderabad | 163631 | 319300 |
| 3 | Jagtial | 0 | 0 |
| 4 | Jangaon | 2 | 0 |

```
cagr=[]
for i in range(len(districts)):
    fv = frgn.loc[i,"2019"]
    iv = frgn.loc[i,"2016"]
    cagrr = (((fv/iv)**(1/3))-1)
    cagr.append(cagrr)
```

```
<ipython-input-496-fa563c011814>:5: RuntimeWarning: invalid value encountered in long_scalars
  cagrr = (((fv/iv)**(1/3))-1)
<ipython-input-496-fa563c011814>:5: RuntimeWarning: divide by zero encountered in long_scalars
  cagrr = (((fv/iv)**(1/3))-1)
```

```
frgn["CAGR"]=cagr
```

```
frgn.head()
```

| | district | 2016 | 2019 | CAGR |
|---|---|---|---|---|
| 0 | Adilabad | 10 | 6 | -0.156567 |
| 1 | Bhadradri Kothagudem | 0 | 0 | NaN |
| 2 | Hyderabad | 163631 | 319300 | 0.249619 |
| 3 | Jagtial | 0 | 0 | NaN |
| 4 | Jangaon | 2 | 0 | -1.000000 |

```
frgn = frgn.replace([np.inf,np.nan],0)
```

```
frgn.head()
```

| | district | 2016 | 2019 | CAGR |
|---|---|---|---|---|
| 0 | Adilabad | 10 | 6 | -0.156567 |
| 1 | Bhadradri Kothagudem | 0 | 0 | 0.000000 |
| 2 | Hyderabad | 163631 | 319300 | 0.249619 |
| 3 | Jagtial | 0 | 0 | 0.000000 |
| 4 | Jangaon | 2 | 0 | -1.000000 |

```
frgn.sort_values(by="CAGR", ascending=False)
```

| | district | 2016 | 2019 | CAGR |
|---|---|---|---|---|
| 16 | Nagarkurnool | 29 | 199 | 0.900283 |
| 6 | Jogulamba Gadwal | 45 | 295 | 0.871557 |
| 2 | Hyderabad | 163631 | 319300 | 0.249619 |
| 29 | Warangal (Urban) | 1899 | 2450 | 0.088630 |
| 25 | Suryapet | 0 | 0 | 0.000000 |
| 20 | Peddapalli | 0 | 0 | 0.000000 |
| 21 | Rajanna Sircilla | 0 | 0 | 0.000000 |
| 22 | Ranga Reddy | 0 | 0 | 0.000000 |
| 23 | Sangareddy | 0 | 0 | 0.000000 |
| 24 | Siddipet | 0 | 0 | 0.000000 |
| 27 | Wanaparthy | 0 | 0 | 0.000000 |
| 26 | Vikarabad | 0 | 0 | 0.000000 |
| 18 | Nirmal | 0 | 0 | 0.000000 |
| 28 | Warangal (Rural) | 0 | 0 | 0.000000 |
| 30 | Yadadri Bhongir | 0 | 0 | 0.000000 |
| 31 | Mulugu | 0 | 575 | 0.000000 |
| 19 | Nizamabad | 0 | 1 | 0.000000 |
| 32 | Narayanapet | 0 | 0 | 0.000000 |
| 17 | Nalgonda | 0 | 0 | 0.000000 |
| 1 | Bhadradri Kothagudem | 0 | 0 | 0.000000 |
| 15 | Medchal | 0 | 0 | 0.000000 |
| 14 | Medak | 0 | 0 | 0.000000 |
| 13 | Mancherial | 0 | 10 | 0.000000 |
| 11 | Mahabubabad | 0 | 0 | 0.000000 |
| 10 | Komaram Bheem Asifabad | 0 | 0 | 0.000000 |
| 9 | Khammam | 0 | 0 | 0.000000 |
| 8 | Karimnagar | 0 | 0 | 0.000000 |

```
frgn_max = frgn.sort_values(by="CAGR", ascending=False).head(3)
frgn_max = frgn_max.reset_index()
frgn_max.drop("index", axis=1, inplace=True)
```

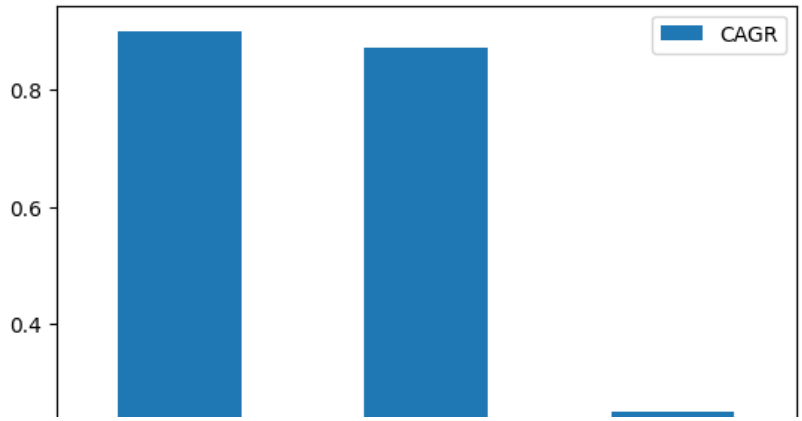
42 Jagtial 01-07-2017 July 2017 247254

```
frgn_max
```

| | district | 2016 | 2019 | CAGR |
|---|---|---|---|---|
| 0 | Nagarkurnool | 29 | 199 | 0.900283 |
| 1 | Jogulamba Gadwal | 45 | 295 | 0.871557 |
| 2 | Hyderabad | 163631 | 319300 | 0.249619 |

```
frgn_max.head().plot("district", "CAGR", kind="bar")
```

```
<Axes: xlabel='district'>
```

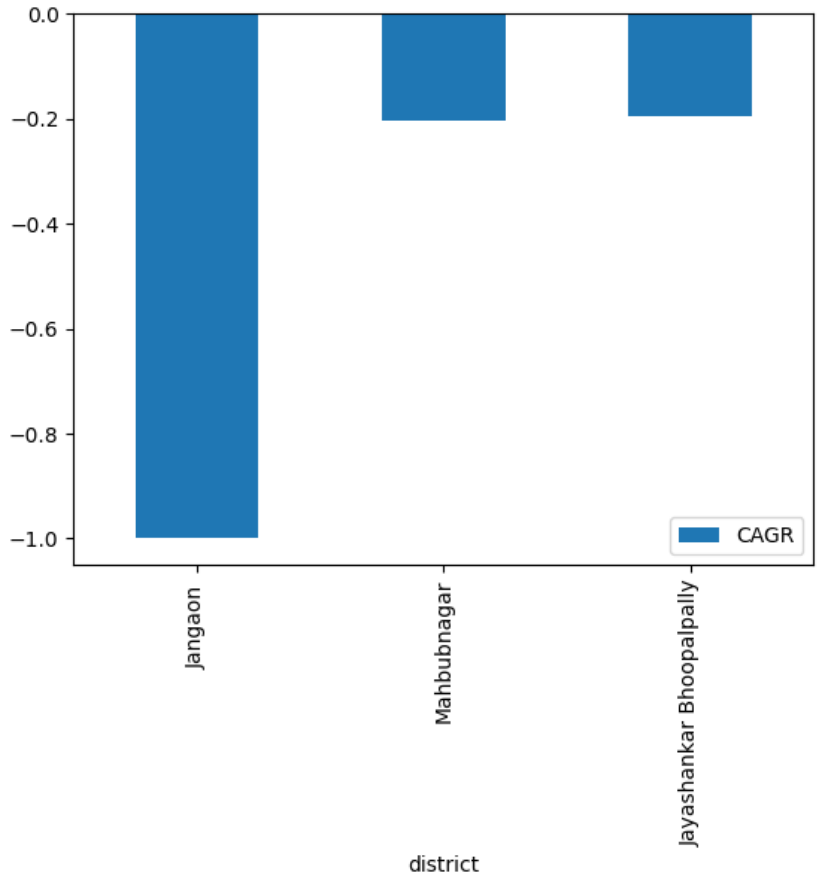



## #3 Foreign Bottom_3 CAGR

```
frgn_min = frgn.sort_values(by="CAGR", ascending=True).head(3)
frgn_min = frgn_min.reset_index()
frgn_min.drop("index", axis=1, inplace=True)
```

```
frgn_min.head().plot("district", "CAGR", kind="bar")
```

```
<Axes: xlabel='district'>
```




```
frgn.to_csv("foreign_cagr.csv")
```

## #4 Peak Months

```
dom_hyd = domestic[domestic["district"]=="Hyderabad"]
```

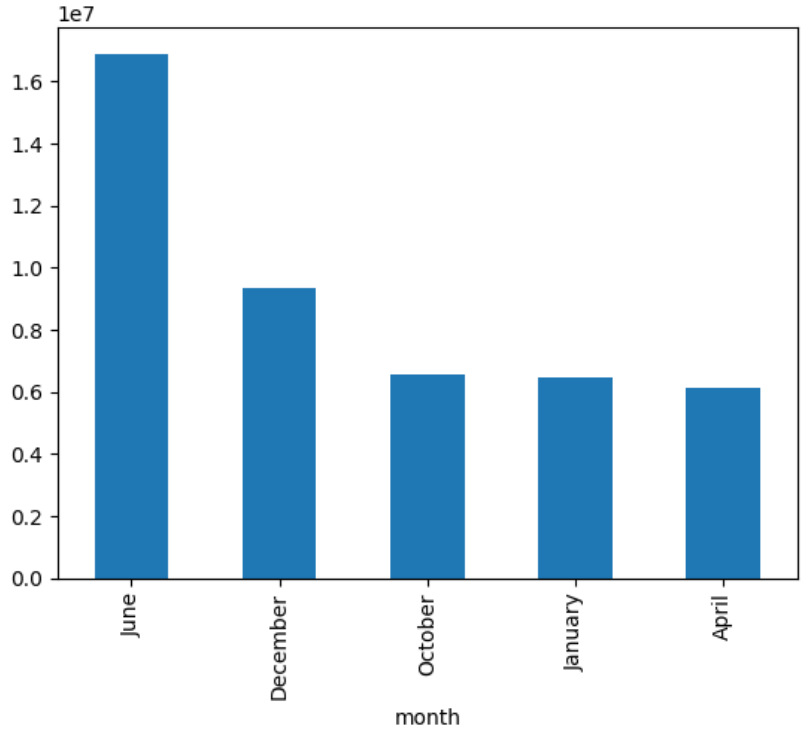
```
dom_hyd.groupby("month")["visitors"].sum().sort_values(ascending=False).head()
```

```
month
June        16897783
December     9338637
October      6552397
January      6452101
```

```
April        6126839
Name: visitors, dtype: int64
```

```
dom_hyd.groupby("month")["visitors"].sum().sort_values(ascending=False).head().plot(kind="bar")
```

```
<Axes: xlabel='month'>
```

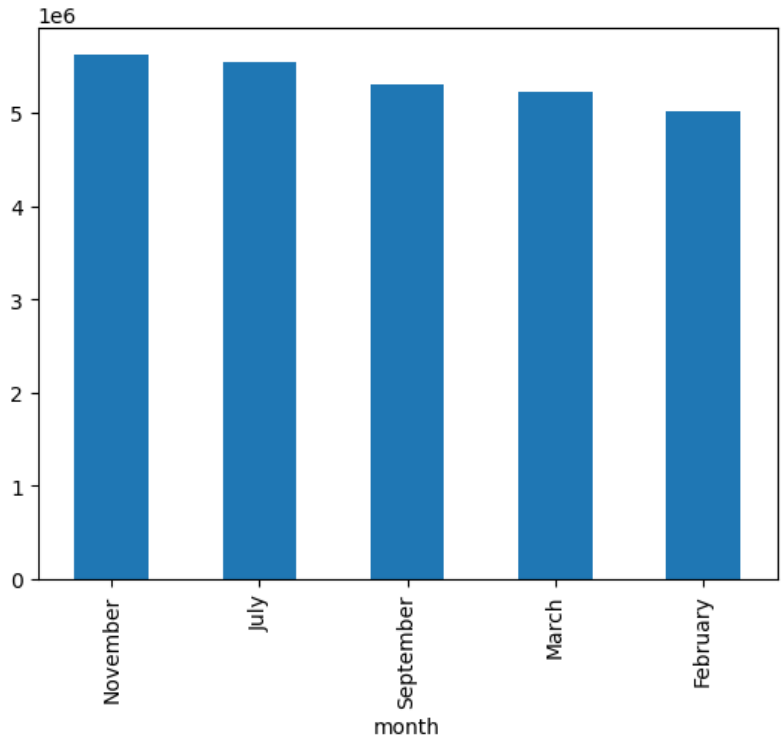



```
dom_hyd.groupby("month")["visitors"].sum().sort_values(ascending=False).tail()
```

```
month
November     5626156
July         5552527
September    5312283
March        5227626
February     5014430
Name: visitors, dtype: int64
```

```
dom_hyd.groupby("month")["visitors"].sum().sort_values(ascending=False).tail().plot(kind="bar")
```

```
<Axes: xlabel='month'>
```




## #5 D/F Ratio

```
df
```

| district | foreign | domestic |
|---|---|---|
| Adilabad | 32 | 7321575.0 |
| Bhadradri Kothagudem | 0 | 21600962.0 |
| Hyderabad | 1044898 | 83900960.0 |
| Jagtial | 0 | 11303514.0 |
| Jangaon | 2 | 826280.0 |
| Jayashankar Bhoopalpally | 1252 | 19632865.0 |
| Jogulamba Gadwal | 945 | 6813340.0 |
| Kamareddy | 0 | 1773.0 |
| Karimnagar | 0 | 9462383.0 |
| Khammam | 0 | 9378315.0 |
| Komaram Bheem Asifabad | 0 | 92734.0 |
| Mahabubabad | 0 | 600697.0 |
| Mahbubnagar | 2282 | 17180118.0 |
| Mancherial | 10 | 867242.0 |
| Medak | 0 | 20542639.0 |
| Medchal | 0 | 0.0 |
| Mulugu | 575 | 1819800.0 |
| Nagarkurnool | 761 | 7424355.0 |
| Nalgonda | 0 | 6401933.0 |
| Narayanpet | 5 | 0.0 |
| Nirmal | 2 | 13315796.0 |
| Nizamabad | 5 | 116147.0 |
| Peddapalli | 0 | 56977.0 |
| Rajanna Sircilla | 0 | 41763276.0 |
| Ranga Reddy | 0 | 0.0 |
| Sangareddy | 0 | 10424510.0 |
| Siddipet | 0 | 5775285.0 |
| Suryapet | 0 | 0.0 |
| Vikarabad | 0 | 0.0 |
| Wanaparthy | 0 | 890078.0 |
| Warangal (Rural) | 306 | 819162.0 |
| Warangal (Urban) | 8821 | 30726603.0 |
| Yadadri Bhongir | 0 | 26893080.0 |

```
ratios = []
for i in range(33):
    ratio = df.iloc[i,1]/df.iloc[i,0]
    ratios.append(ratio)
df["Ratio"]=ratios
```

```
<ipython-input-514-392f952b0f6c>:3: RuntimeWarning: divide by zero encountered in double_scalars
  ratio = df.iloc[i,1]/df.iloc[i,0]
<ipython-input-514-392f952b0f6c>:3: RuntimeWarning: invalid value encountered in double_scalars
  ratio = df.iloc[i,1]/df.iloc[i,0]
```

```
df
```

| district | foreign | domestic | Ratio |
|---|---|---|---|
| Adilabad | 32 | 7321575.0 | 2.287992e+05 |
| Bhadradri Kothagudem | 0 | 21600962.0 | inf |
| Hyderabad | 1044898 | 83900960.0 | 8.029584e+01 |
| Jagtial | 0 | 11303514.0 | inf |
| Jangaon | 2 | 826280.0 | 4.131400e+05 |
| Jayashankar Bhoopalpally | 1252 | 19632865.0 | 1.568120e+04 |
| Jogulamba Gadwal | 945 | 6813340.0 | 7.209884e+03 |
| Kamareddy | 0 | 1773.0 | inf |
| Karimnagar | 0 | 9462383.0 | inf |
| Khammam | 0 | 9378315.0 | inf |
| Komaram Bheem Asifabad | 0 | 92734.0 | inf |
| Mahabubabad | 0 | 600697.0 | inf |
| Mahbubnagar | 2282 | 17180118.0 | 7.528535e+03 |
| Mancherial | 10 | 867242.0 | 8.672420e+04 |
| Medak | 0 | 20542639.0 | inf |
| Medchal | 0 | 0.0 | NaN |
| Mulugu | 575 | 1819800.0 | 3.164870e+03 |
| Nagarkurnool | 761 | 7424355.0 | 9.756051e+03 |
| Nalgonda | 0 | 6401933.0 | inf |
| Narayanpet | 5 | 0.0 | 0.000000e+00 |
| Nirmal | 2 | 13315796.0 | 6.657898e+06 |
| Nizamabad | 5 | 116147.0 | 2.322940e+04 |
| Peddapalli | 0 | 56977.0 | inf |
| Rajanna Sircilla | 0 | 41763276.0 | inf |
| Ranga Reddy | 0 | 0.0 | NaN |
| Sangareddy | 0 | 10424510.0 | inf |
| Siddipet | 0 | 5775285.0 | inf |
| Suryapet | 0 | 0.0 | NaN |
| Vikarabad | 0 | 0.0 | NaN |
| Wanaparthy | 0 | 890078.0 | inf |
| Warangal (Rural) | 306 | 819162.0 | 2.677000e+03 |

```
df = df.replace([np.nan, np.inf], 0)
```

```
df_ratio = df.sort_values(by="Ratio", ascending=False).where(df["foreign"]>100)
```

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```
df_ratio
```

| district | foreign | domestic | Ratio |
|---|---|---|---|
| Nirmal | NaN | NaN | NaN |
| Jangaon | NaN | NaN | NaN |
| Adilabad | NaN | NaN | NaN |
| Mancherial | NaN | NaN | NaN |
| Nizamabad | NaN | NaN | NaN |
| Jayashankar Bhoopalpally | 1252.0 | 19632865.0 | 15681.202077 |
| Nagarkurnool | 761.0 | 7424355.0 | 9756.051248 |
| Mahbubnagar | 2282.0 | 17180118.0 | 7528.535495 |
| Jogulamba Gadwal | 945.0 | 6813340.0 | 7209.883598 |
| Warangal (Urban) | 8821.0 | 30726603.0 | 3483.346899 |
| Mulugu | 575.0 | 1819800.0 | 3164.869565 |
| Warangal (Rural) | 306.0 | 819162.0 | 2677.000000 |
| Hyderabad | 1044898.0 | 83900960.0 | 80.295837 |
| Mahabubabad | NaN | NaN | NaN |
| Komaram Bheem Asifabad | NaN | NaN | NaN |
| Wanaparthy | NaN | NaN | NaN |
| Vikarabad | NaN | NaN | NaN |
| Suryapet | NaN | NaN | NaN |
| Siddipet | NaN | NaN | NaN |
| Sangareddy | NaN | NaN | NaN |
| Ranga Reddy | NaN | NaN | NaN |
| Rajanna Sircilla | NaN | NaN | NaN |
| Peddapalli | NaN | NaN | NaN |
| Jagtial | NaN | NaN | NaN |

```
df_ratio = df_ratio.dropna()
```

```
df_ratio.sort_values(by="Ratio", ascending=True, inplace=True)
```

```
<ipython-input-520-0ded6af9972e>:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-vie
  df_ratio.sort_values(by="Ratio", ascending=True, inplace=True)
```

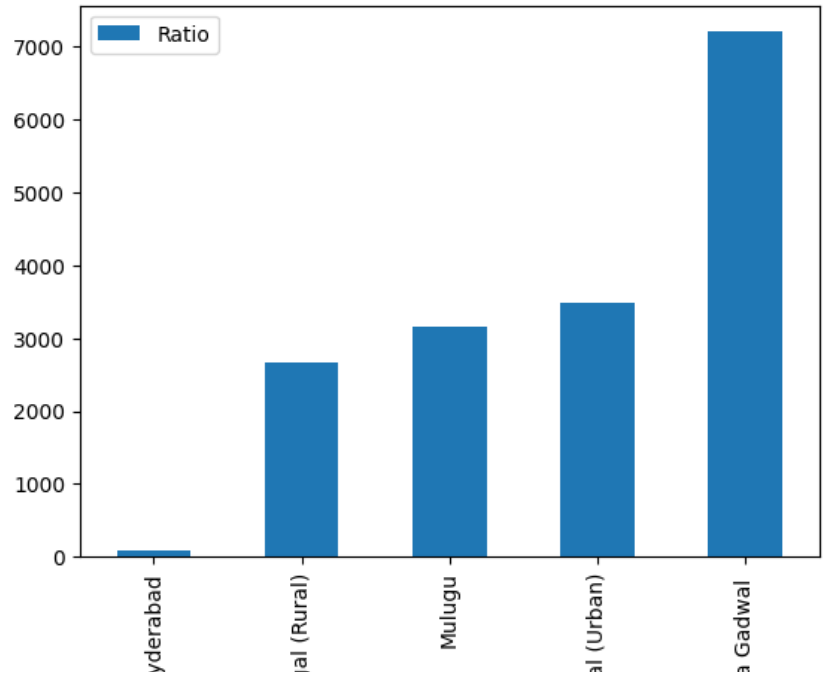
```
df_ratio = df_ratio.reset_index()
```

```
df_ratio.head()
```

| | district | foreign | domestic | Ratio |
|---|---|---|---|---|
| 0 | Hyderabad | 1044898.0 | 83900960.0 | 80.295837 |
| 1 | Warangal (Rural) | 306.0 | 819162.0 | 2677.000000 |
| 2 | Mulugu | 575.0 | 1819800.0 | 3164.869565 |
| 3 | Warangal (Urban) | 8821.0 | 30726603.0 | 3483.346899 |
| 4 | Jogulamba Gadwal | 945.0 | 6813340.0 | 7209.883598 |

```
df_ratio.head().plot("district", "Ratio", kind="bar")
```

```
<Axes: xlabel='district'>
```




```
df_ratio.tail().sort_values(by="Ratio", ascending=False, inplace=True)
```

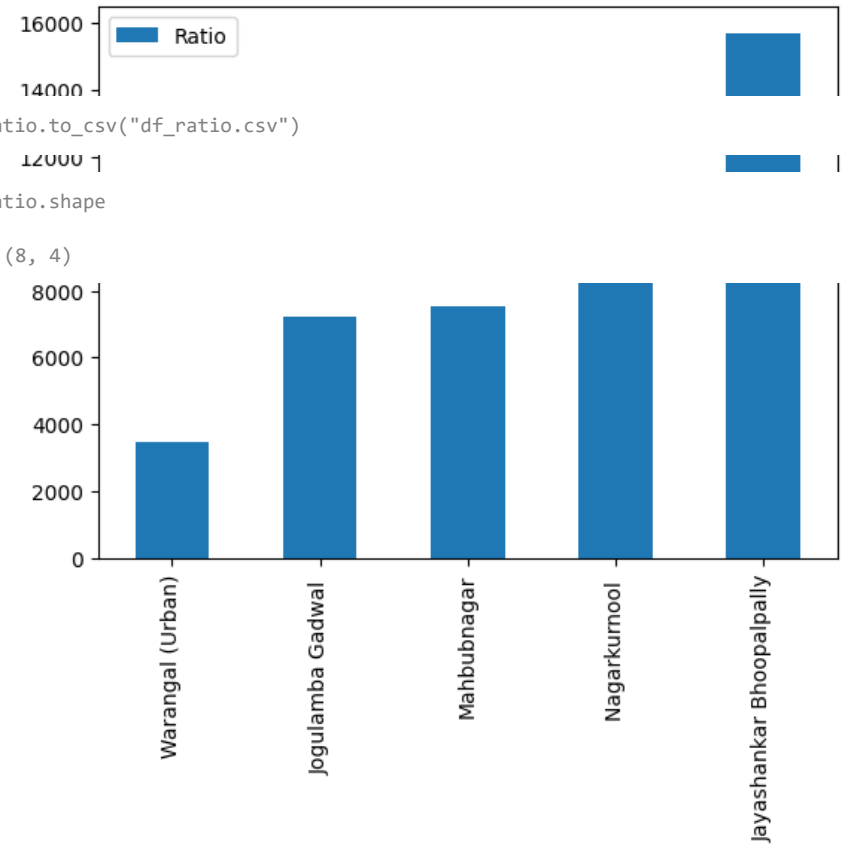
```
<ipython-input-524-65184db0af46>:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-vie
  df_ratio.tail().sort_values(by="Ratio", ascending=False, inplace=True)
```

```
df_ratio.tail()
```

| | district | foreign | domestic | Ratio |
|---|---|---|---|---|
| 3 | Warangal (Urban) | 8821.0 | 30726603.0 | 3483.346899 |
| 4 | Jogulamba Gadwal | 945.0 | 6813340.0 | 7209.883598 |
| 5 | Mahbubnagar | 2282.0 | 17180118.0 | 7528.535495 |
| 6 | Nagarkurnool | 761.0 | 7424355.0 | 9756.051248 |
| 7 | Jayashankar Bhoopalpally | 1252.0 | 19632865.0 | 15681.202077 |

```
df_ratio.tail().plot("district", "Ratio", kind="bar")
```

```
<Axes: xlabel='district'>
```




```
df_ratio.to_csv("df_ratio.csv")
```

```
df_ratio.shape
```

```
(8, 4)
```




| | | | | | |
|---|---|---|---|---|---|
| **368** | Yadadri Bhongir | 01-09-2017 | September | 2017 | 678925 |
| **369** | Yadadri Bhongir | 01-10-2017 | October | 2017 | 683500 |
| **370** | Yadadri Bhongir | 01-11-2017 | November | 2017 | 537600 |
| **371** | Yadadri Bhongir | 01-12-2017 | December | 2017 | 481075 |
| **0** | Adilabad | 01-01-2018 | January | 2018 | 320356 |
| **1** | Adilabad | 01-02-2018 | February | 2018 | 36550 |
| **2** | Adilabad | 01-03-2018 | March | 2018 | 23011 |
| **3** | Adilabad | 01-04-2018 | April | 2018 | 14183 |
| **4** | Adilabad | 01-05-2018 | May | 2018 | 8197 |
| **5** | Adilabad | 01-06-2018 | June | 2018 | 12052 |
| **6** | Adilabad | 01-07-2018 | July | 2018 | 24666 |
| **7** | Adilabad | 01-08-2018 | August | 2018 | 38939 |
| **8** | Adilabad | 01-09-2018 | September | 2018 | 25875 |
| **9** | Adilabad | 01-10-2018 | October | 2018 | 30257 |
| **10** | Adilabad | 01-11-2018 | November | 2018 | 49181 |
| **11** | Adilabad | 01-12-2018 | December | 2018 | 61476 |
| **12** | Bhadradri Kothagudem | 01-01-2018 | January | 2018 | 421275 |
| **13** | Bhadradri Kothagudem | 01-02-2018 | February | 2018 | 240634 |
| **14** | Bhadradri Kothagudem | 01-03-2018 | March | 2018 | 421275 |
| **15** | Bhadradri Kothagudem | 01-04-2018 | April | 2018 | 341258 |
| **16** | Bhadradri Kothagudem | 01-05-2018 | May | 2018 | 291273 |
| **17** | Bhadradri Kothagudem | 01-06-2018 | June | 2018 | 290512 |
| **18** | Bhadradri Kothagudem | 01-07-2018 | July | 2018 | 220304 |
| **19** | Bhadradri Kothagudem | 01-08-2018 | August | 2018 | 219548 |
| **20** | Bhadradri Kothagudem | 01-09-2018 | September | 2018 | 334878 |
| **21** | Bhadradri Kothagudem | 01-10-2018 | October | 2018 | 322974 |
| **22** | Bhadradri Kothagudem | 01-11-2018 | November | 2018 | 253464 |
| **23** | Bhadradri Kothagudem | 01-12-2018 | December | 2018 | 442483 |

| | | | | | |
|---|---|---|---|---|---|
| 24 | Hyderabad | 01-01-2018 | January | 2018 | 1978396 |
| 25 | Hyderabad | 01-02-2018 | February | 2018 | 1365837 |
| 26 | Hyderabad | 01-03-2018 | March | 2018 | 1415938 |
| 27 | Hyderabad | 01-04-2018 | April | 2018 | 1586375 |
| 28 | Hyderabad | 01-05-2018 | May | 2018 | 1189492 |
| 29 | Hyderabad | 01-06-2018 | June | 2018 | 1595067 |
| 30 | Hyderabad | 01-07-2018 | July | 2018 | 1470042 |
| 31 | Hyderabad | 01-08-2018 | August | 2018 | 1591470 |
| 32 | Hyderabad | 01-09-2018 | September | 2018 | 1508086 |
| 33 | Hyderabad | 01-10-2018 | October | 2018 | 2207478 |
| 34 | Hyderabad | 01-11-2018 | November | 2018 | 1671320 |
| 35 | Hyderabad | 01-12-2018 | December | 2018 | 1964150 |
| 36 | Jagtial | 01-01-2018 | January | 2018 | 614082 |
| 37 | Jagtial | 01-02-2018 | February | 2018 | 349576 |
| 38 | Jagtial | 01-03-2018 | March | 2018 | 416716 |
| 39 | Jagtial | 01-04-2018 | April | 2018 | 372874 |
| 40 | Jagtial | 01-05-2018 | May | 2018 | 641363 |
| 41 | Jagtial | 01-06-2018 | June | 2018 | 182505 |
| 42 | Jagtial | 01-07-2018 | July | 2018 | 182473 |
| 43 | Jagtial | 01-08-2018 | August | 2018 | 272685 |
| 44 | Jagtial | 01-09-2018 | September | 2018 | 273121 |
| 45 | Jagtial | 01-10-2018 | October | 2018 | 138206 |
| 46 | Jagtial | 01-11-2018 | November | 2018 | 277997 |
| 47 | Jagtial | 01-12-2018 | December | 2018 | 231323 |
| 48 | Jangaon | 01-01-2018 | January | 2018 | 17180 |
| 49 | Jangaon | 01-02-2018 | February | 2018 | 18600 |
| 50 | Jangaon | 01-03-2018 | March | 2018 | 17300 |
| 51 | Jangaon | 01-04-2018 | April | 2018 | 18100 |
| 52 | Jangaon | 01-05-2018 | May | 2018 | 19660 |
| 53 | Jangaon | 01-06-2018 | June | 2018 | 23050 |
| 54 | Jangaon | 01-07-2018 | July | 2018 | 26280 |
| 55 | Jangaon | 01-08-2018 | August | 2018 | 26020 |
| 56 | Jangaon | 01-09-2018 | September | 2018 | 28830 |
| 57 | Jangaon | 01-10-2018 | October | 2018 | 29470 |
| 58 | Jangaon | 01-11-2018 | November | 2018 | 29570 |
| 59 | Jangaon | 01-12-2018 | December | 2018 | 36962 |
| 60 | Jayashankar Bhoopalpally | 01-01-2018 | January | 2018 | 6519850 |
| 61 | Jayashankar Bhoopalpally | 01-02-2018 | February | 2018 | 8626250 |
| 62 | Jayashankar Bhoopalpally | 01-03-2018 | March | 2018 | 146150 |
| 63 | Jayashankar Bhoopalpally | 01-04-2018 | April | 2018 | 149150 |
| 64 | Jayashankar Bhoopalpally | 01-05-2018 | May | 2018 | 152050 |
| 65 | Jayashankar Bhoopalpally | 01-06-2018 | June | 2018 | 159400 |
| 66 | Jayashankar Bhoopalpally | 01-07-2018 | July | 2018 | 128550 |
| 67 | Jayashankar Bhoopalpally | 01-08-2018 | August | 2018 | 184700 |
| 68 | Jayashankar Bhoopalpally | 01-09-2018 | September | 2018 | 192300 |
| 69 | Jayashankar Bhoopalpally | 01-10-2018 | October | 2018 | 195400 |
| 70 | Jayashankar Bhoopalpally | 01-11-2018 | November | 2018 | 196500 |
| 71 | Jayashankar Bhoopalpally | 01-12-2018 | December | 2018 | 245625 |