```python
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

df=pd.read_csv(r"B:\DATA ANALYST PROJECTS\POWERBI + PYTHON + SQL\
Global Wether\data.csv")

df.shape
```

```
(38007, 41)
```

```python
df.head(3)
```

```
        country location_name    latitude   longitude        timezone  \
0  Afghanistan         Kabul       34.52       69.18      Asia/Kabul
1      Albania         Tirana      41.33       19.82    Europe/Tirane
2      Algeria        Algiers      36.76        3.05   Africa/Algiers

   last_updated_epoch         last_updated  temperature_celsius  \
0          1693301400  2023-08-29 14:00                 28.8
1          1693301400  2023-08-29 11:30                 27.0
2          1693301400  2023-08-29 10:30                 28.0

   temperature_fahrenheit condition_text  ...  air_quality_PM2.5  \
0                    83.8          Sunny  ...                7.9
1                    80.6  Partly cloudy  ...               28.2
2                    82.4  Partly cloudy  ...                6.4

   air_quality_PM10  air_quality_us-epa-index air_quality_gb-defra-
index  \
0              11.1                         1
1
1              29.6                         2
3
2               7.9                         1
1


     sunrise    sunset   moonrise   moonset      moon_phase
moon_illumination
0  05:24 AM  06:24 PM  05:39 PM  02:48 AM  Waxing Gibbous
93
1  06:04 AM  07:19 PM  06:50 PM  03:25 AM  Waxing Gibbous
93
2  06:16 AM  07:21 PM  06:46 PM  03:50 AM  Waxing Gibbous
93

[3 rows x 41 columns]
```

```python
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 38007 entries, 0 to 38006
Data columns (total 41 columns):
 #   Column                   Non-Null Count  Dtype
---  ------                   --------------  -----
 0   country                  38007 non-null  object
 1   location_name            38007 non-null  object
 2   latitude                 38007 non-null  float64
 3   longitude                38007 non-null  float64
 4   timezone                 38007 non-null  object
 5   last_updated_epoch       38007 non-null  int64
 6   last_updated             38007 non-null  object
 7   temperature_celsius      38007 non-null  float64
```

```
 8   temperature_fahrenheit      38007 non-null   float64
 9   condition_text              38007 non-null   object
 10  wind_mph                    38007 non-null   float64
 11  wind_kph                    38007 non-null   float64
 12  wind_degree                 38007 non-null   int64
 13  wind_direction              38007 non-null   object
 14  pressure_mb                 38007 non-null   float64
 15  pressure_in                 38007 non-null   float64
 16  precip_mm                   38007 non-null   float64
 17  precip_in                   38007 non-null   float64
 18  humidity                    38007 non-null   int64
 19  cloud                       38007 non-null   int64
 20  feels_like_celsius          38007 non-null   float64
 21  feels_like_fahrenheit       38007 non-null   float64
 22  visibility_km               38007 non-null   float64
 23  visibility_miles            38007 non-null   float64
 24  uv_index                    38007 non-null   float64
 25  gust_mph                    38007 non-null   float64
 26  gust_kph                    38007 non-null   float64
 27  air_quality_Carbon_Monoxide 38007 non-null   float64
 28  air_quality_Ozone           38007 non-null   float64
 29  air_quality_Nitrogen_dioxide 38007 non-null  float64
 30  air_quality_Sulphur_dioxide 38007 non-null   float64
 31  air_quality_PM2.5           38007 non-null   float64
 32  air_quality_PM10            38007 non-null   float64
 33  air_quality_us-epa-index    38007 non-null   int64
 34  air_quality_gb-defra-index  38007 non-null   int64
 35  sunrise                     38007 non-null   object
 36  sunset                      38007 non-null   object
 37  moonrise                    38007 non-null   object
 38  moonset                     38007 non-null   object
 39  moon_phase                  38007 non-null   object
 40  moon_illumination           38007 non-null   int64
dtypes: float64(23), int64(7), object(11)
memory usage: 11.9+ MB
```

```python
df.drop(['sunrise','sunset','moonset','moon_phase','moon_illumination'
,'visibility_km','visibility_miles','precip_mm',
        'precip_in','cloud'],axis=1,inplace=True)
```

```python
pd.isnull(df).sum()
```

```
country                  0
location_name            0
latitude                 0
longitude                0
timezone                 0
last_updated_epoch       0
last_updated             0
temperature_celsius      0
temperature_fahrenheit   0
condition_text           0
wind_mph                 0
wind_kph                 0
wind_degree              0
wind_direction           0
pressure_mb              0
pressure_in              0
humidity                 0
feels_like_celsius       0
feels_like_fahrenheit    0
```

```
uv_index                       0
gust_mph                       0
gust_kph                       0
air_quality_Carbon_Monoxide    0
air_quality_Ozone              0
air_quality_Nitrogen_dioxide   0
air_quality_Sulphur_dioxide    0
air_quality_PM2.5              0
air_quality_PM10               0
air_quality_us-epa-index       0
air_quality_gb-defra-index     0
moonrise                       0
dtype: int64
```

```
df.describe()
```

```
           latitude      longitude   last_updated_epoch
temperature_celsius   \
count  38007.000000   38007.000000         3.800700e+04
38007.000000
mean       19.302734      21.769718         1.701943e+09
19.067517
std        24.524344      65.686083         5.069021e+06
10.761861
min       -41.300000    -175.200000         1.693301e+09           -
41.900000
25%         3.750000      -6.840000         1.697404e+09
12.000000
50%        17.250000      23.240000         1.702150e+09
22.000000
75%        41.320000      49.880000         1.706378e+09
27.000000
max        64.100000     179.220000         1.710520e+09
45.400000

        temperature_fahrenheit       wind_mph       wind_kph
wind_degree   \
count             38007.000000   38007.000000   38007.000000
38007.000000
mean                 66.321380       7.405846      11.921249
162.095930
std                  19.371444       5.162904       8.310840
106.601417
min                 -43.400000       2.200000       3.600000
1.000000
25%                  53.600000       3.800000       6.100000
70.000000
50%                  71.600000       5.600000       9.000000
150.000000
75%                  80.600000      10.500000      16.900000
250.000000
max                 113.700000      91.900000     148.000000
360.000000

         pressure_mb    pressure_in   ...       gust_mph       gust_kph   \
count  38007.000000   38007.000000   ...   38007.000000   38007.000000
mean    1013.983924      29.942265   ...      12.361002      19.894017
std        7.474722       0.220618   ...       7.405434      11.917910
min      958.000000      28.290000   ...       0.000000       0.000000
25%     1010.000000      29.830000   ...       6.700000      10.800000
50%     1013.000000      29.910000   ...      11.100000      17.800000
```

```
75%        1018.000000      30.060000    ...     16.300000      26.300000
max        1074.000000      31.710000    ...     96.400000     155.200000

       air_quality_Carbon_Monoxide  air_quality_Ozone  \
count                 38007.000000       38007.000000
mean                    582.553963          42.997574
std                    1396.927075          32.330800
min                      96.800000           0.000000
25%                     237.000000          17.900000
50%                     290.400000          40.400000
75%                     447.300000          62.900000
max                   41870.102000         555.000000

       air_quality_Nitrogen_dioxide  air_quality_Sulphur_dioxide  \
count                  38007.000000                 38007.000000
mean                      14.625269                     8.320320
std                       27.126104                    22.817989
min                        0.000000                     0.000000
25%                        1.000000                     0.500000
50%                        4.500000                     1.900000
75%                       15.800000                     6.400000
max                      575.800000                   557.000000

       air_quality_PM2.5  air_quality_PM10  air_quality_us-epa-
index  \
count      38007.000000      38007.000000                 38007.000000

mean          25.711661         46.160841                     1.623333

std           64.739571        107.770226                     1.076332

min            0.500000          0.500000                     1.000000

25%            2.600000          4.700000                     1.000000

50%            7.600000         13.100000                     1.000000

75%           23.400000         40.000000                     2.000000

max         1558.800000       3566.400000                     6.000000


       air_quality_gb-defra-index
count                38007.000000
mean                     2.479701
std                      2.701638
min                      1.000000
25%                      1.000000
50%                      1.000000
75%                      2.000000
max                     10.000000

[8 rows x 24 columns]

df.columns

Index(['country', 'location_name', 'latitude', 'longitude',
'timezone',
       'last_updated_epoch', 'last_updated', 'temperature_celsius',
       'temperature_fahrenheit', 'condition_text', 'wind_mph',
'wind_kph',
       'wind_degree', 'wind_direction', 'pressure_mb', 'pressure_in',
```

```
        'precip_mm', 'precip_in', 'humidity', 'cloud',
'feels_like_celsius',
        'feels_like_fahrenheit', 'visibility_km', 'visibility_miles',
        'uv_index', 'gust_mph', 'gust_kph',
'air_quality_Carbon_Monoxide',
        'air_quality_Ozone', 'air_quality_Nitrogen_dioxide',
        'air_quality_Sulphur_dioxide', 'air_quality_PM2.5',
'air_quality_PM10',
        'air_quality_us-epa-index', 'air_quality_gb-defra-index',
'sunrise',
        'sunset', 'moonrise', 'moonset', 'moon_phase',
'moon_illumination'],
      dtype='object')
```

# Key Performance Indicator

**1-FIND THE TOTAL DISTINCT COUNTRY AVAILABLE IN DATA.**

```
total_country=df['country'].nunique()
total_country

185
```

**2-SHOW THE AVG HUMIDITY FROM DATA.**

```
avg_humidity=df['humidity'].mean().round(2)
avg_humidity

70.76
```

**3-SHOW AVG UV INDEX FROM DATA.**

```
avg_uvindex=df['uv_index'].mean().round(2)
avg_uvindex

2.48
```

**4- WHAT IS THE AVG TEMP IN CELSIUS.**

```
avg_temp=df['temperature_celsius'].mean().round(2)
avg_temp

19.07
```

**5-WHAT IS THE AVG TEMP IN FAHRENHEIT.**

```
avg_f_temp=df['temperature_fahrenheit'].mean().round(2)
avg_f_temp

66.32
```

# Exploratory Data Analysis ( EDA ) Questions

**1-SHOW THE TOP 3 COUNTRY WITH MAXIMUM AIR QUYALITY BY OZONE.**

```
ozone_top_country=df.groupby('country')
['air_quality_Ozone'].max().sort_values(ascending=False).head(3)
ozone_top_country

country
Mexico                   555.0
United Arab Emirates     320.4
Afghanistan              317.6
Name: air_quality_Ozone, dtype: float64

plt.figure(figsize=(5,5))
ozone_top_country=df.groupby('country')
['air_quality_Ozone'].max().sort_values(ascending=False).head(3)

cv=sns.barplot(x=ozone_top_country.index,y=ozone_top_country.values,la
bel=ozone_top_country.index)
cv.bar_label(cv.containers[0])
sns.despine()

plt.title('Top 3 Countries With Max Air Quality By Ozone')
plt.ylabel('Count Of Ozone Air Quality',color='red')
plt.xlabel('Country',color='red')
plt.xticks([])
plt.grid(False)
plt.legend(title='Country',loc='center left',
bbox_to_anchor=(1.0,0.2),shadow=True)
plt.show()
```
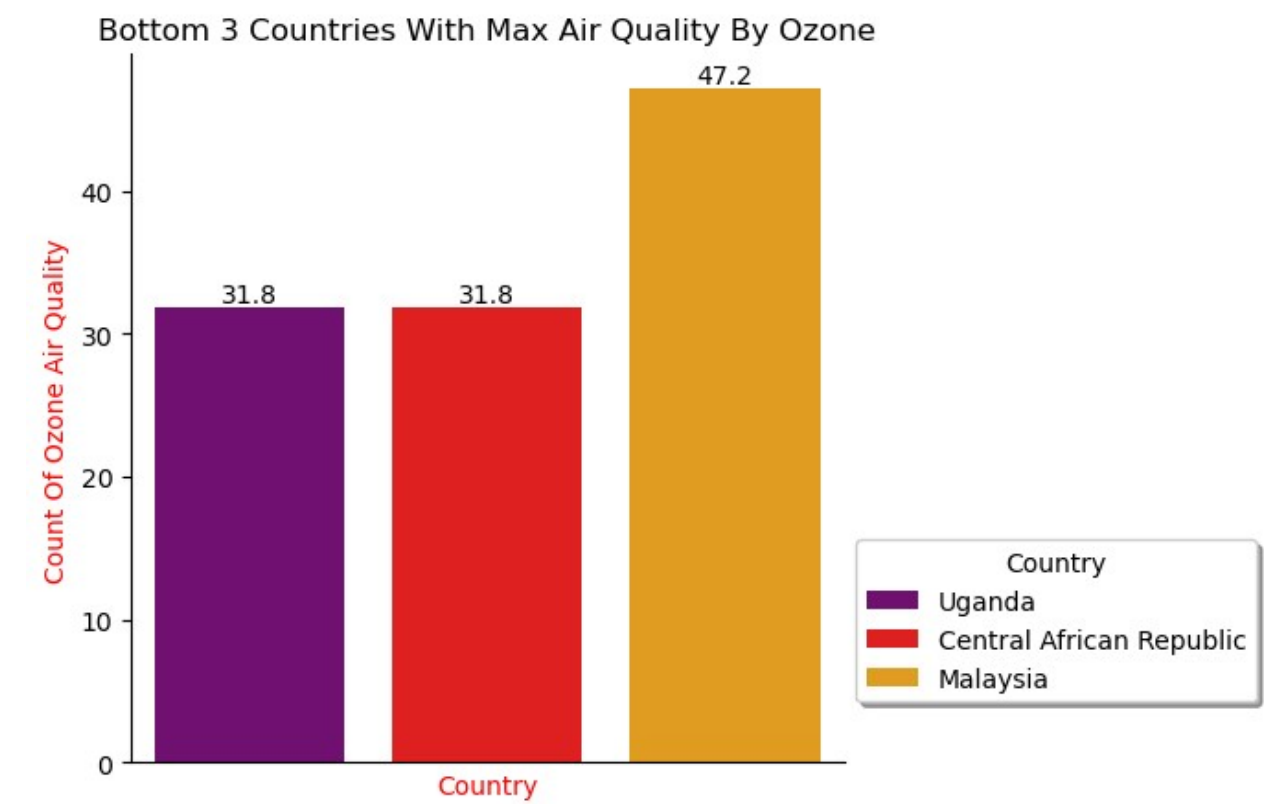


Top 3 Countries With Max Air Quality By Ozone
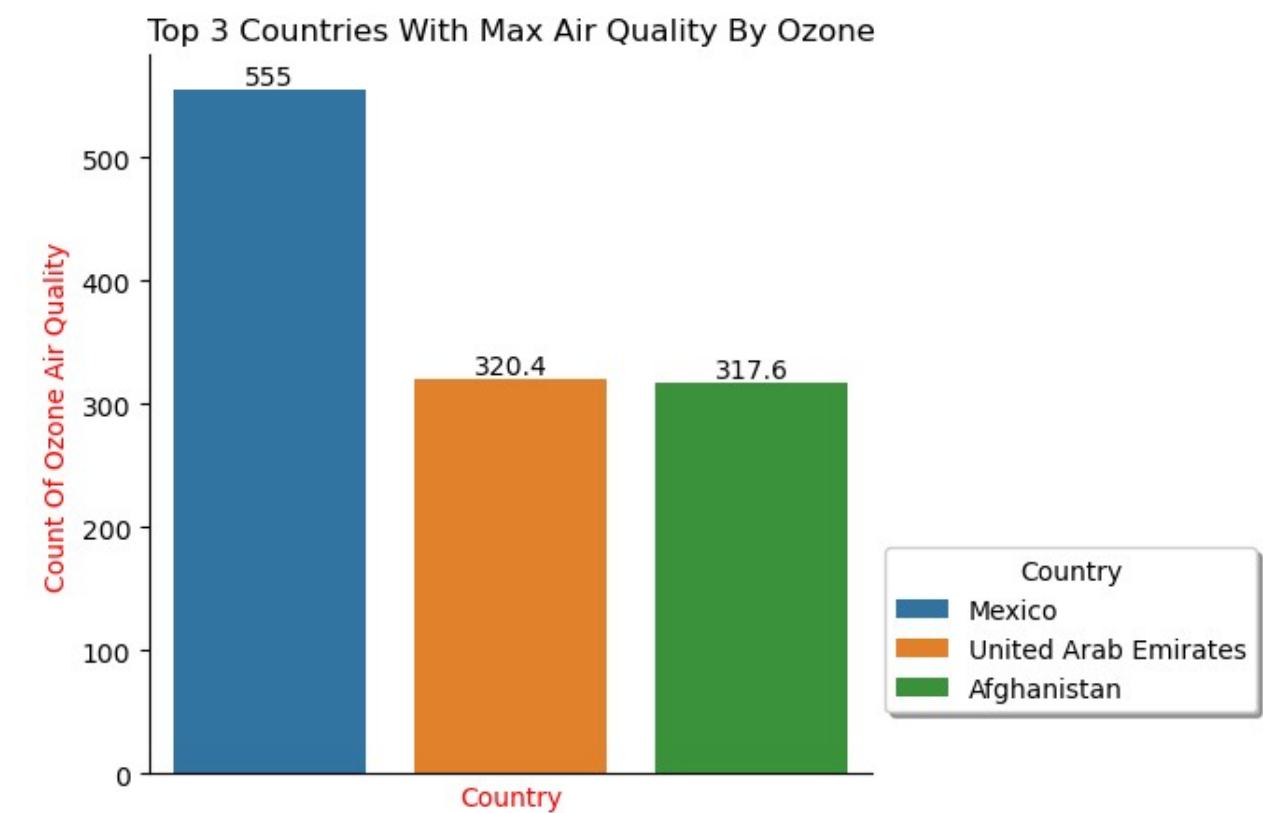
**1-SHOW THE BOTTOM 3 COUNTRY WITH MAXIMUM AIR QUYALITY BY OZONE.**

```
ozone_bottom_country=df.groupby('country')
['air_quality_Ozone'].max().sort_values(ascending=False).tail(3)
ozone_bottom_country

country
Uganda                   47.2
```

```
Central African Republic     31.8
Malaysia                     31.8
Name: air_quality_Ozone, dtype: float64

plt.figure(figsize=(5,5))

barorder=ozone_bottom_country.index[::-1]
barcolor=['purple','red','orange']

cv=sns.barplot(x=ozone_bottom_country.index,y=ozone_bottom_country.val
ues,order=barorder,label=ozone_bottom_country.index,
            palette=barcolor)
cv.bar_label(cv.containers[0])
sns.despine()

plt.title('Bottom 3 Countries With Max Air Quality By Ozone')
plt.ylabel('Count Of Ozone Air Quality',color='red')
plt.xlabel('Country',color='red')
plt.xticks([])
plt.legend(title='Country',loc='center left',
bbox_to_anchor=(1.0,0.2),shadow=True)
plt.show()
```



Bottom 3 Countries With Max Air Quality By Ozone

**FROM THIS DATA :**

```
I-MEXICO (555) IS THE TOP COUNTRY WITH AIR QUALITY BY OZONE.

II-UGANDA & CENTRAL AFRICAN REPUBLIC (31.8) IS LOWEST COUNTRY WITH AIR
QUALITY BY OZONE.
```

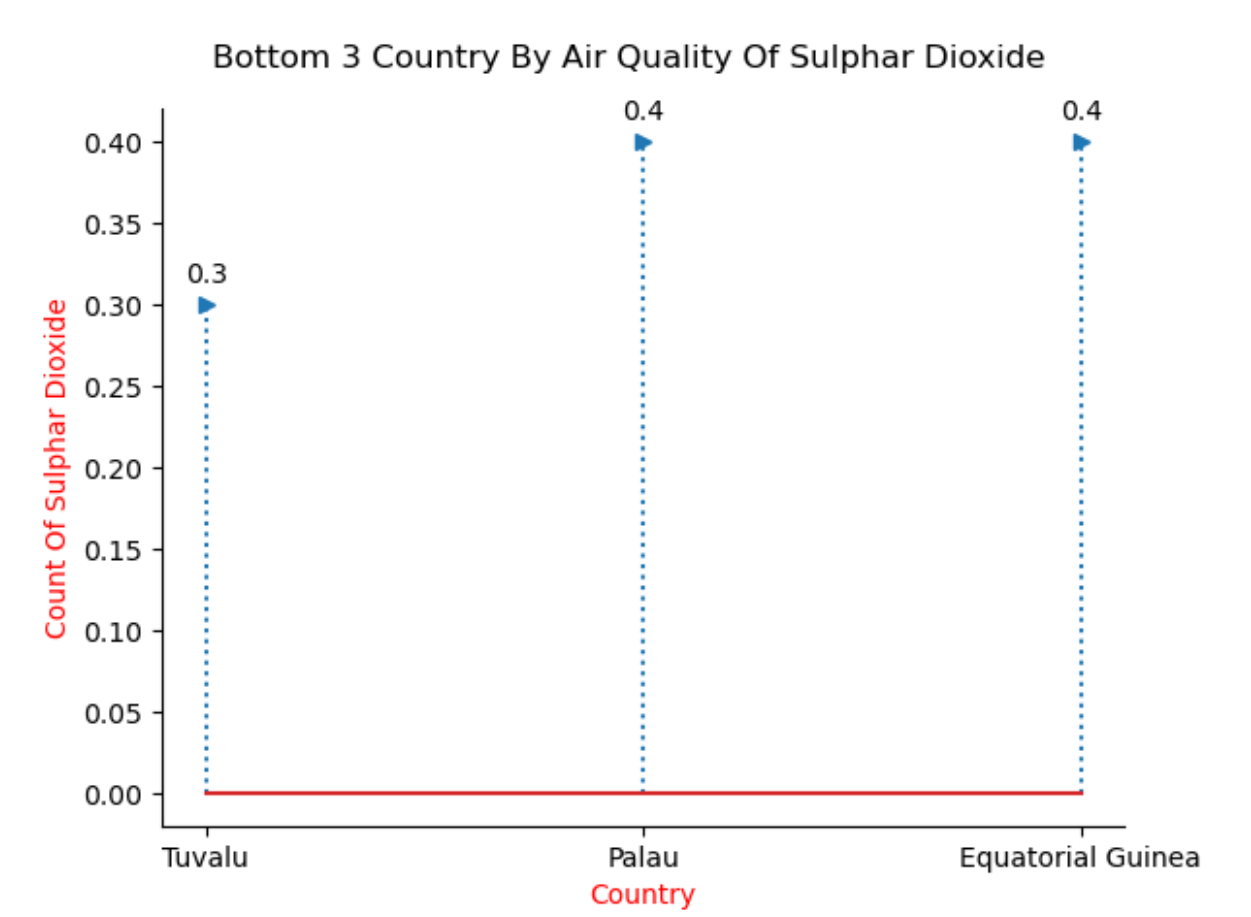**2- SHOW THE TOP 3 COUNTRY WITH MAXIMUM AIR QUALITY BY SULPHAR DIOXIDE.**

```
sulphar_top_country=df.groupby('country')
['air_quality_Sulphur_dioxide'].max().sort_values(ascending=False).hea
d(3)
sulphar_top_country
```

```
country
China          557.0
Iran           511.2
South Korea    469.2
Name: air_quality_Sulphur_dioxide, dtype: float64
```

```python
plt.stem(sulphar_top_country.index,sulphar_top_country.values,linefmt=
':',markerfmt='*')
for x, y in zip(sulphar_top_country.index,
sulphar_top_country.values):
    plt.annotate(f'{y}', (x, y), textcoords="offset points",
xytext=(0,6), ha='center')
plt.suptitle('Top 3 Country By Air Quality Of Sulphar Dioxide',
y=0.95)
plt.ylabel('Count Of Sulphar Dioxide',color='red')
plt.xlabel('Country',color='red')
sns.despine()
plt.show()
```
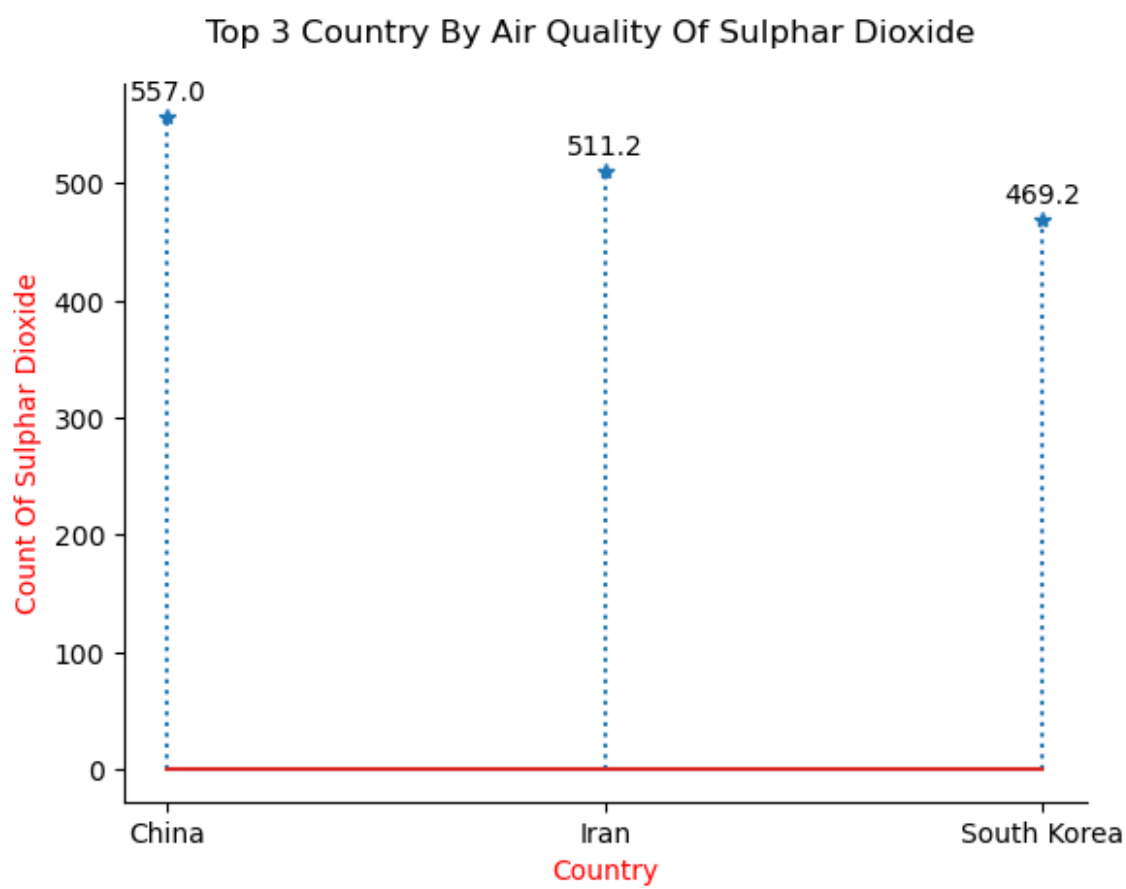


**2- SHOW THE BOTTOM 3 COUNTRY WITH MAXIMUM AIR QUALITY BY SULPHAR DIOXIDE.**

```python
sulphar_bottom_country=df.groupby('country')
['air_quality_Sulphur_dioxide'].max().sort_values(ascending=False).tai
l(3)
sulphar_bottom_country
```

```
country
Palau               0.4
Equatorial Guinea   0.4
Tuvalu              0.3
Name: air_quality_Sulphur_dioxide, dtype: float64
```

```python
sulphar_bottom_country_sorted =
sulphar_bottom_country.sort_values(ascending=True)
```

```
plt.stem(sulphar_bottom_country_sorted.index,sulphar_bottom_country_so
rted.values,linefmt=':',markerfmt='>')
for x, y in zip(sulphar_bottom_country.index,
sulphar_bottom_country.values):
    plt.annotate(f'{y}', (x, y), textcoords="offset points",
xytext=(0,8), ha='center')
plt.suptitle('Bottom 3 Country By Air Quality Of Sulphar Dioxide',
y=0.95)
plt.ylabel('Count Of Sulphar Dioxide',color='red')
plt.xlabel('Country',color='red')
sns.despine()
plt.show()
```



Bottom 3 Country By Air Quality Of Sulphar Dioxide

**FROM THIS DATA :**

I-CHINA (557) IS THE TOP COUNTRY WITH AIR QUALITY BY SULPHAR DIOXIDE.

II-TUVALU (0.3) IS LOWEST COUNTRY WITH AIR QUALITY BY SULPHAR DIOXIDE.

**3-SHOW THE TOP 3 COUNTRY WITH MAXIMUM AIR QUALITY BY CARBON MONOOXIDE.**

```
top_carbon_country=df.groupby('country')
['air_quality_Carbon_Monoxide'].max().sort_values(ascending=False).hea
d(3)
top_carbon_country

country
Indonesia     41870.102
Thailand      20080.600
Malaysia      18371.600
Name: air_quality_Carbon_Monoxide, dtype: float64

sns.lineplot(x=top_carbon_country.index,y=top_carbon_country.values,ma
rker='*',markersize=20)
```

```
for x, y in zip(top_carbon_country.index, top_carbon_country.values):
    y_rounded = round(y, 1)
    plt.annotate(f'{y_rounded}', (x, y), textcoords="offset points",
xytext=(0,8), ha='left')
sns.despine()

title_pos=plt.title('Top 3 Air Quality Country By Carbon Monooxide ')
title_pos.set_position([0.7,1.0])
plt.xlabel('Country',color='red',fontsize=10)
plt.ylabel('Carbon Monooxide in (Parts per Million)',color='red')
plt.ylim(15000,45000)
plt.show()
```
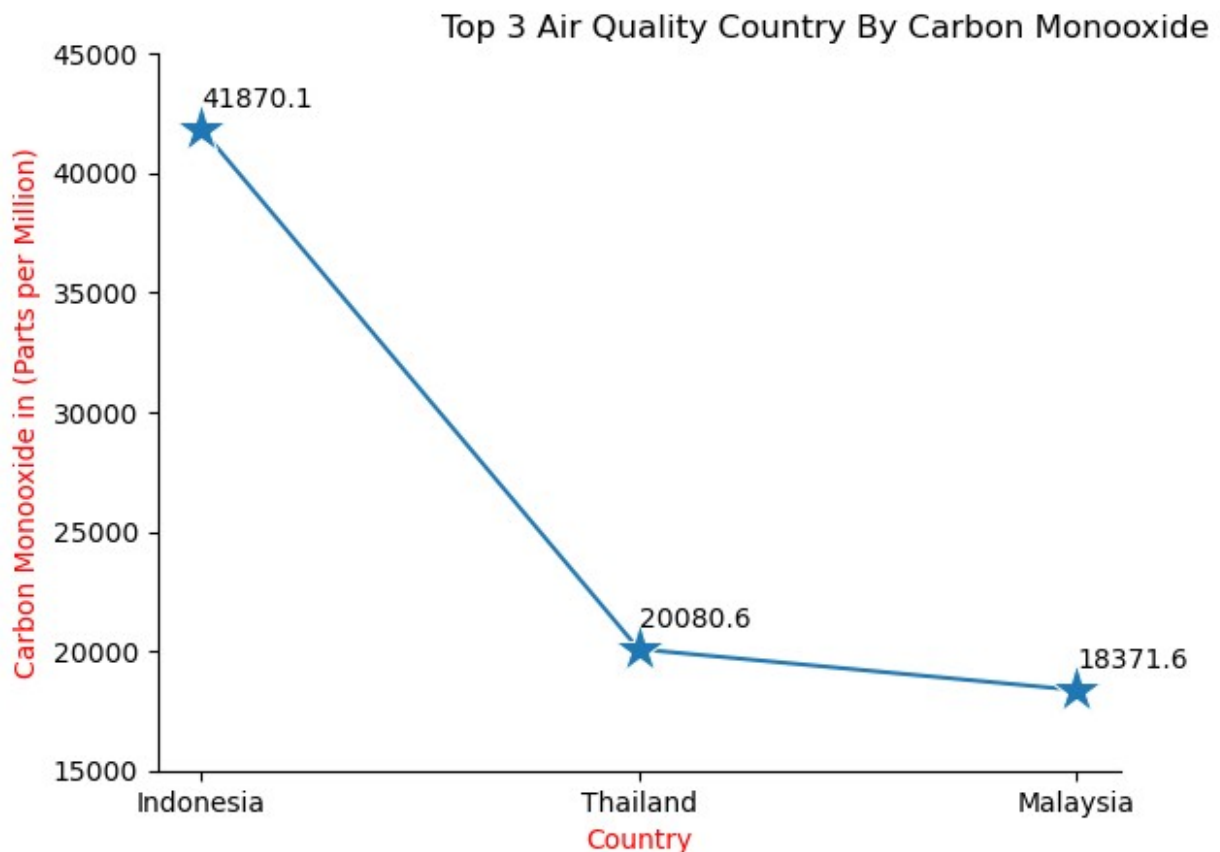


**3-SHOW THE BOTTOM 3 COUNTRY WITH MAXIMUM AIR QUALITY BY CARBON MONOOXIDE.**

```
bottom_carbon_country=df.groupby('country')
['air_quality_Carbon_Monoxide'].max().sort_values(ascending=False).tai
l(3)
bottom_carbon_country

country
Fiji Islands        243.7
Andorra             237.0
Marshall Islands    233.7
Name: air_quality_Carbon_Monoxide, dtype: float64

bottom_carbon_country_sorted =
bottom_carbon_country.sort_values(ascending=True)
sns.lineplot(x=bottom_carbon_country_sorted.index,y=bottom_carbon_coun
try_sorted.values,marker='*',markersize=20)
for x, y in zip(bottom_carbon_country.index,
bottom_carbon_country.values):
    y_rounded = round(y, 1)
```

```
    plt.annotate(f'{y_rounded}', (x, y), textcoords="offset points",
xytext=(0,8), ha='left')
sns.despine()

title_pos=plt.title('Bottom 3 Air Quality Country By Carbon Monooxide
')
title_pos.set_position([0.7,1.0])
plt.xlabel('Country',color='red',fontsize=10)
plt.ylabel('Carbon Monooxide in (Parts per Million)',color='red')
plt.show()
```



Bottom 3 Air Quality Country By Carbon Monooxide
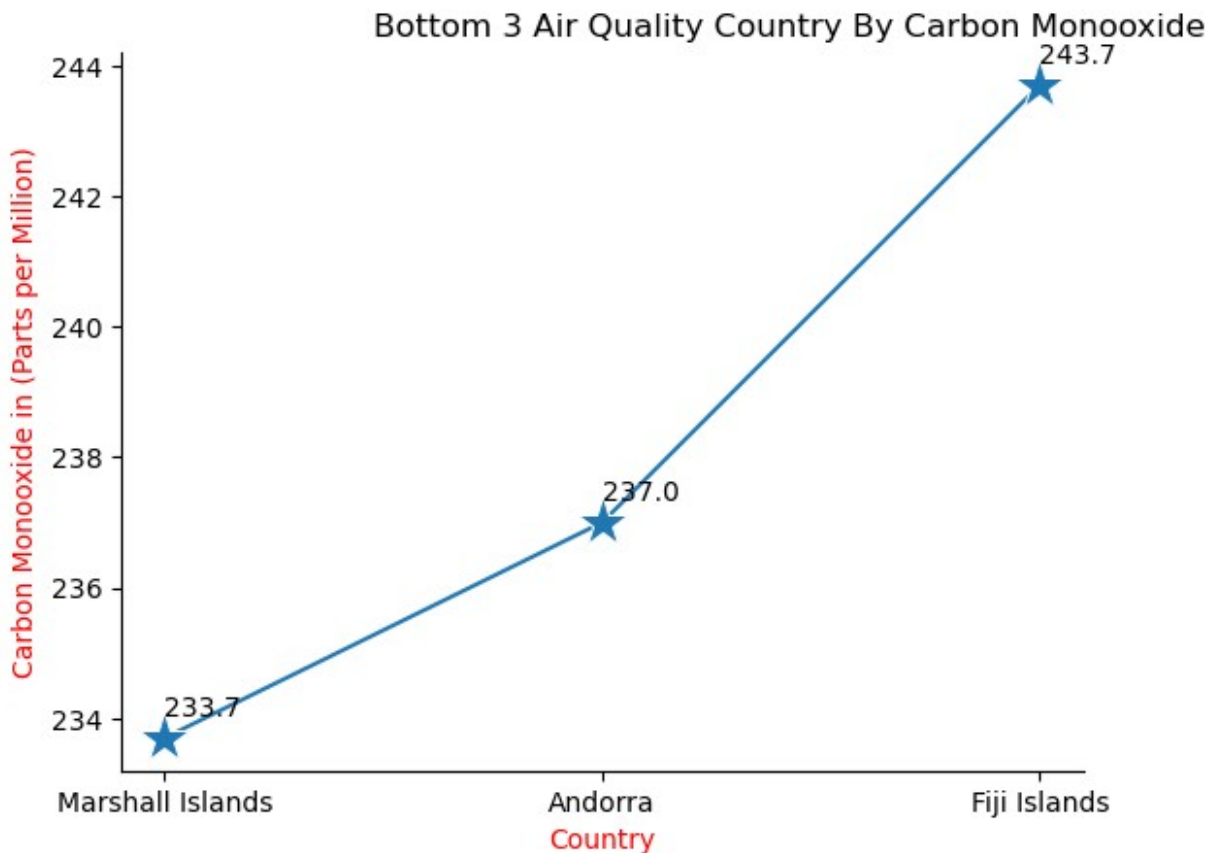
**FROM THIS DATA :**

I-INDONESIA (41870.1) IS THE TOP COUNTRY WITH AIR QUALITY BY CARBON MONOOXIDE.

II-MARSHALL ISLANDS (233.7) IS LOWEST COUNTRY WITH AIR QUALITY BY CARBON MONOOXIDE.

**4-SHOW THE TOP 3 COUNTRY WITH MAXIMUM AIR QUALITY BY NITROGEN DIOXIDE.**

```
top_nitrogen_country=df.groupby('country')
['air_quality_Nitrogen_dioxide'].max().sort_values(ascending=False).he
ad(3)
top_nitrogen_country

country
Iran           575.8
Malaysia       493.5
South Korea    383.9
Name: air_quality_Nitrogen_dioxide, dtype: float64

plt.figure(figsize=(5,5))

barcolor=['Violet','gray','pink']
```

```
cv=sns.barplot(y=top_nitrogen_country.index,x=top_nitrogen_country.val
ues,label=top_nitrogen_country.index,
           palette=barcolor)
cv.bar_label(cv.containers[0])
sns.despine()

title_pos=plt.title('Top 3 Countries With Max Air Quality By Nitrogen
Dioxide')
title_pos.set_position([1.2,1.0])
plt.ylabel('Country',color='red')
plt.xlabel('Nitrogen Dioxide In Parts Per Billion ',color='red')
plt.yticks([])
plt.legend(title='Country',loc='center left',
bbox_to_anchor=(1.0,0.2),shadow=True)
plt.show()
```



Top 3 Countries With Max Air Quality By Nitrogen Dioxide
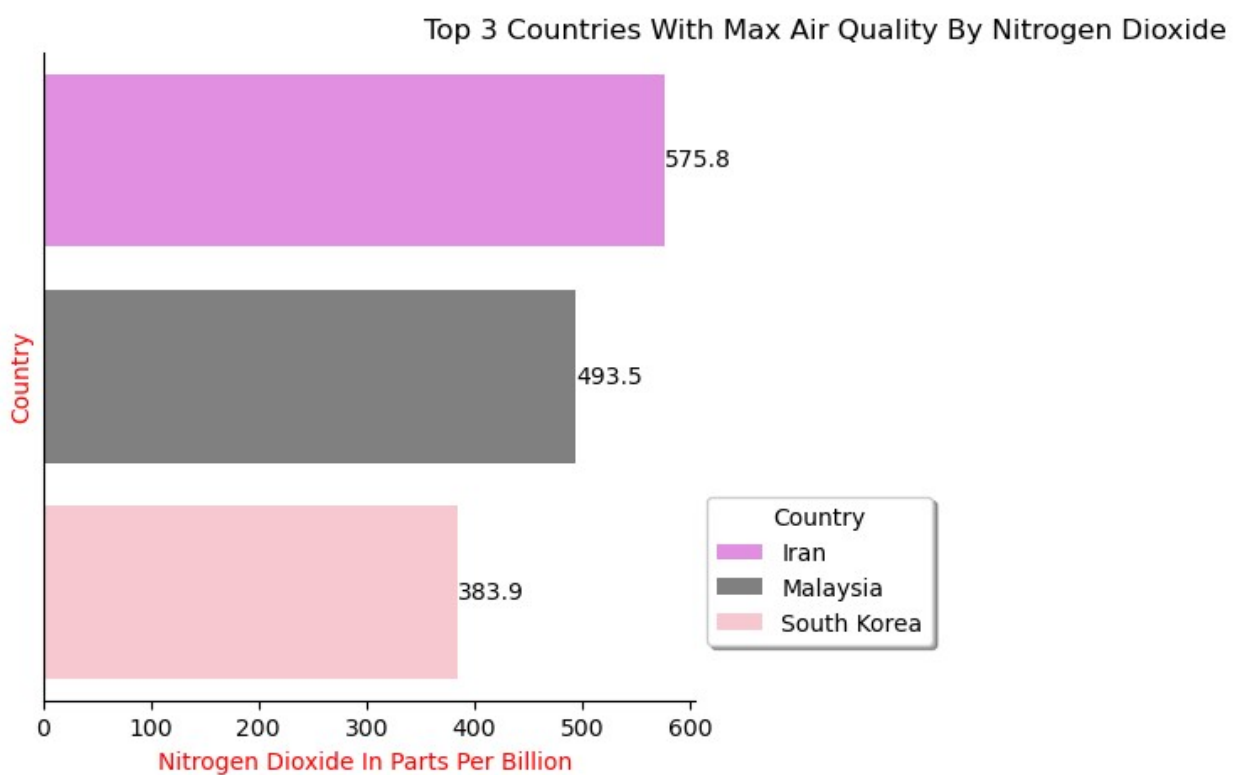
**4-SHOW THE BOTTOM 3 COUNTRY WITH MAXIMUM AIR QUALITY BY NITROGEN DIOXIDE.**

```
bottom_nitrogen_country=df.groupby('country')
['air_quality_Nitrogen_dioxide'].max().sort_values(ascending=False).ta
il(3)
bottom_nitrogen_country

country
Micronesia        0.1
Tuvalu            0.0
Marshall Islands  0.0
Name: air_quality_Nitrogen_dioxide, dtype: float64

plt.figure(figsize=(5,5))

barorder=bottom_nitrogen_country.index[::-1]
barcolor=['purple','green','red']

cv=sns.barplot(y=bottom_nitrogen_country.index,x=bottom_nitrogen_count
ry.values,order=barorder,
            label=bottom_nitrogen_country.index,
```

```
            palette=barcolor)
cv.bar_label(cv.containers[0])
sns.despine()

title_pos=plt.title('Bottom 3 Countries With Max Air Quality By
Nitrogen Dioxide')
title_pos.set_position([1.2,1.0])
plt.ylabel('Country',color='red')
plt.xlabel('Nitrogen Dioxide In Parts Per Billion ',color='red')
plt.yticks([])
plt.legend(title='Country',loc='center left',
bbox_to_anchor=(1.0,0.2),shadow=True)
plt.show()
```



Bottom 3 Countries With Max Air Quality By Nitrogen Dioxide
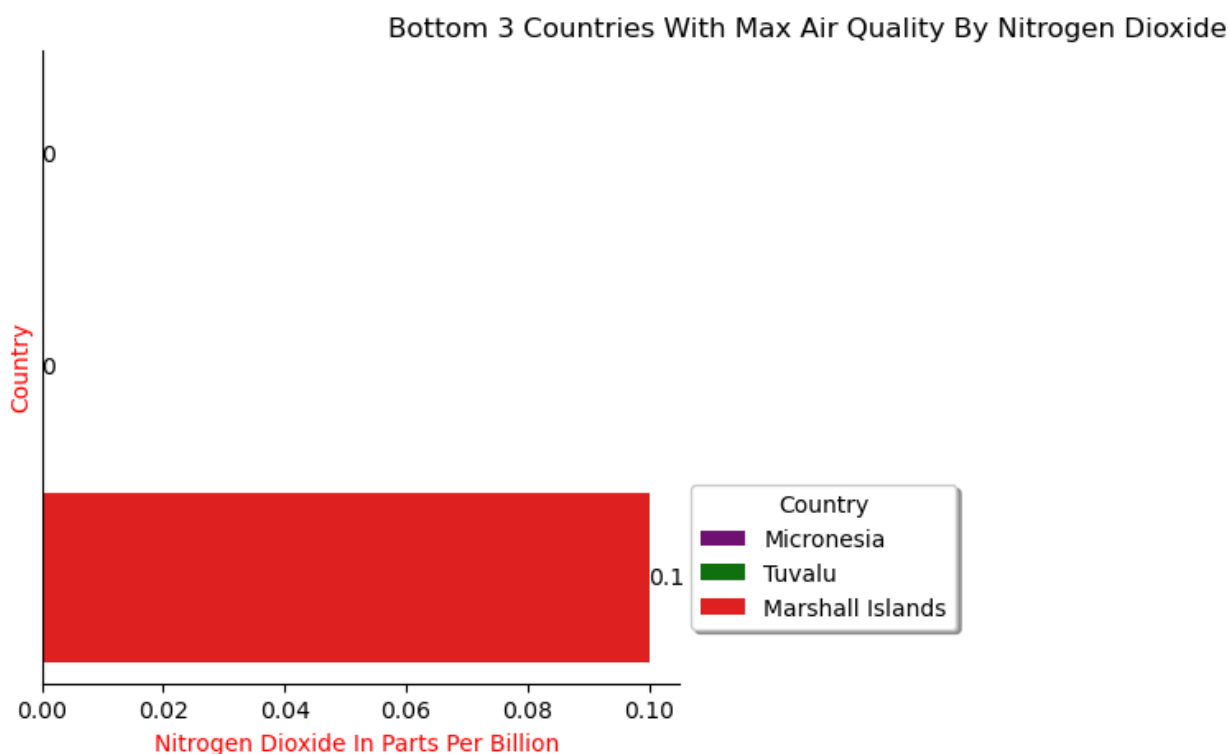
**FROM THIS DATA :**

I-IRAN (575.8) IS THE TOP COUNTRY WITH AIR QUALITY BY NITROGEN DIOXIDE.

II-MICRONESIA & TUVALU (0.0) IS LOWEST COUNTRY WITH AIR QUALITY BY NITROGEN DIOXIDE.

**5-SHOW THE TOP 3 COUNTRY WITH MAXIMUM AIR QUALITY BY PM10.**

```
top_PM10_country=df.groupby('country')
['air_quality_PM10'].max().sort_values(ascending=False).head(3)
top_PM10_country

country
Mauritania     3566.4
Chad           2504.3
Indonesia      1859.6
Name: air_quality_PM10, dtype: float64

sns.scatterplot(x=top_PM10_country.index,y=top_PM10_country.values,hue
=top_PM10_country.index,palette='dark',
               s=50,marker='D')
for x, y in zip(top_PM10_country.index, top_PM10_country.values):
    y_rounded = round(y, 1)
```

```
    plt.annotate(f'{y_rounded}', (x, y), textcoords="offset points",
xytext=(0,8), ha='left')
sns.despine()

title_pos=plt.title('Top 3 Countries With Max Air Quality By PM10')
title_pos.set_position([0.8,1.0])
plt.legend(title='Country',loc='center left',
bbox_to_anchor=(1.2,0.2),shadow=True)
plt.ylabel('Count Of PM10',color='red')
plt.xlabel('Country',color='red')
plt.xticks([])
plt.show()
```
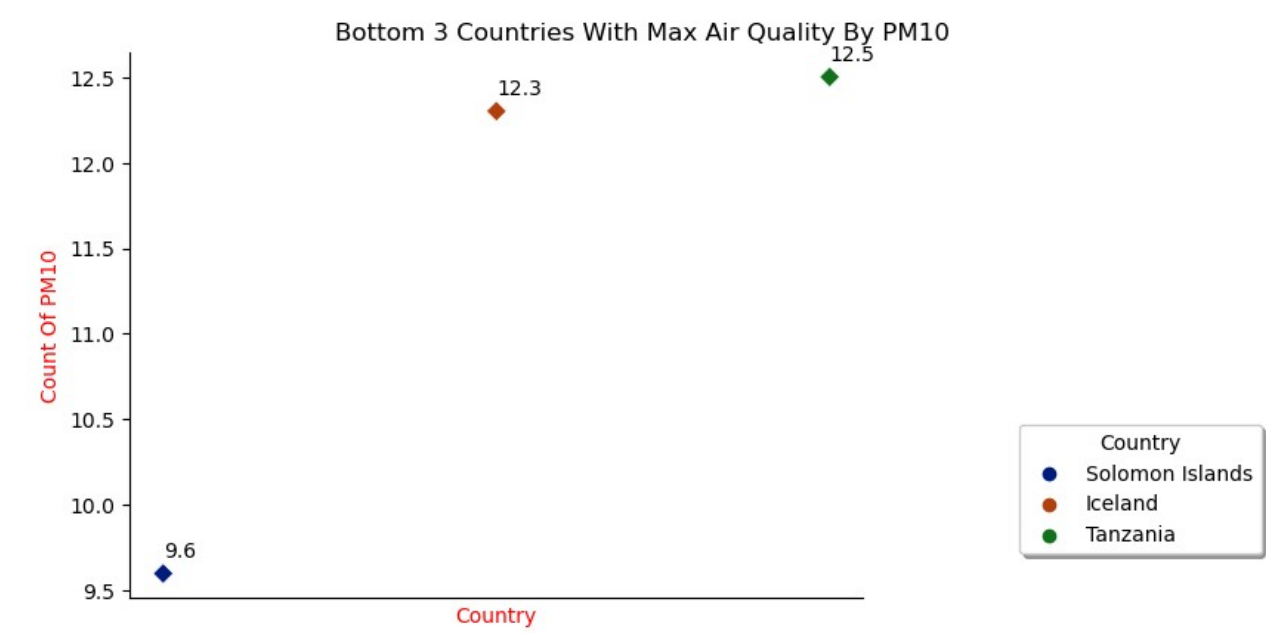


Top 3 Countries With Max Air Quality By PM10
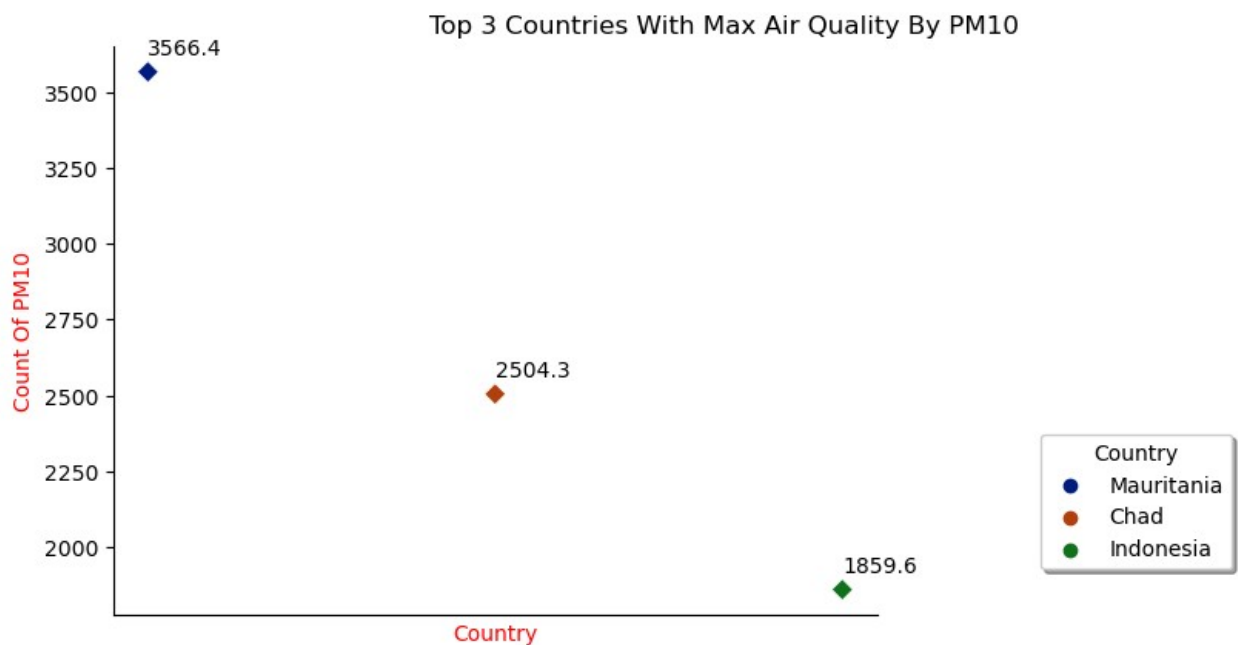
**5-SHOW THE BOTTOM 3 COUNTRY WITH MAXIMUM AIR QUALITY BY PM10.**

```
bottom_PM10_country=df.groupby('country')
['air_quality_PM10'].max().sort_values(ascending=False).tail(3)
bottom_PM10_country

country
Tanzania            12.5
Iceland             12.3
Solomon Islands      9.6
Name: air_quality_PM10, dtype: float64

bottom_PM10_country=df.groupby('country')
['air_quality_PM10'].max().sort_values(ascending=False).tail(3)
bottom_PM10_country_sorted =
bottom_PM10_country.sort_values(ascending=True)
sns.scatterplot(x=bottom_PM10_country_sorted.index,y=bottom_PM10_count
ry_sorted.values,hue=bottom_PM10_country_sorted.index
            ,palette='dark',s=50,marker='D')
for x, y in zip(bottom_PM10_country.index,
bottom_PM10_country.values):
    y_rounded = round(y, 1)
    plt.annotate(f'{y_rounded}', (x, y), textcoords="offset points",
xytext=(0,8), ha='left')
sns.despine()

title_pos=plt.title('Bottom 3 Countries With Max Air Quality By PM10')
title_pos.set_position([0.7,0.0])
```

```
plt.legend(title='Country',loc='center left',
bbox_to_anchor=(1.2,0.2),shadow=True)
plt.ylabel('Count Of PM10',color='red')
plt.xlabel('Country',color='red')
plt.xticks([])
plt.show()
```



Bottom 3 Countries With Max Air Quality By PM10

**FROM THIS DATA :**

I-MAURITANIA (3566.4) IS THE TOP COUNTRY WITH AIR QUALITY BY PM10.

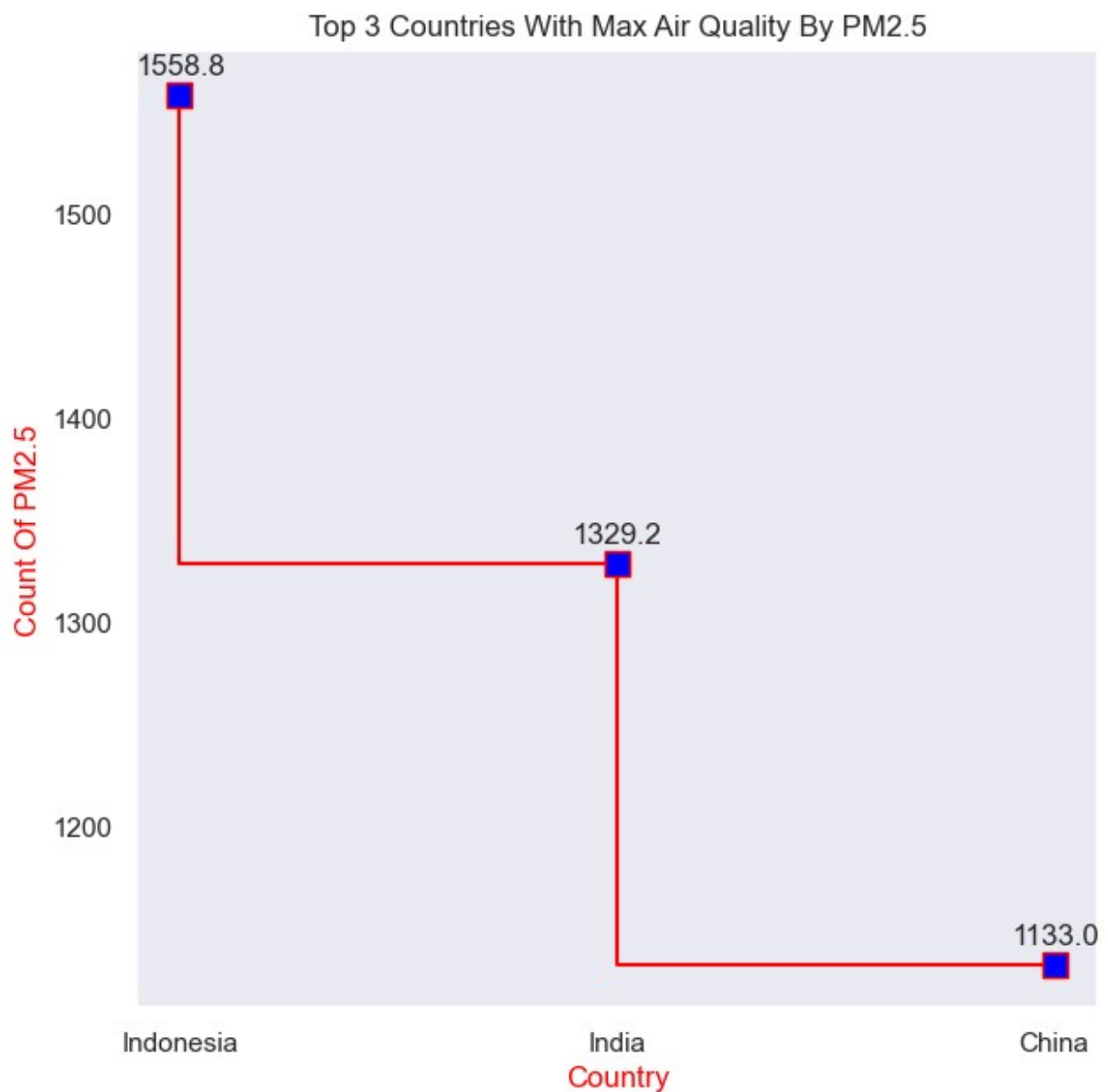II-SOLOMON ISLANDS (9.6) IS LOWEST COUNTRY WITH AIR QUALITY BY PM10.

**6-SHOW THE TOP 3 COUNTRY WITH MAXIMUM AIR QUALITY BY PM2.5**

```
top_PM25_country=df.groupby('country')
['air_quality_PM2.5'].max().sort_values(ascending=False).head(3)
top_PM25_country

country
Indonesia     1558.8
India         1329.2
China         1133.0
Name: air_quality_PM2.5, dtype: float64

plt.figure(figsize=(7,7))
sns.set(style='dark')
plt.step(x=top_PM25_country.index,y=top_PM25_country.values,color='red
',marker='s',markerfacecolor='Blue',markersize=10)
for x, y in zip(top_PM25_country.index, top_PM25_country.values):
    y_rounded = round(y, 1)
    plt.annotate(f'{y_rounded}', (x, y), textcoords="offset
points",xytext=(0,8), ha='center')

title_pos=plt.title('Top 3 Countries With Max Air Quality By PM2.5')
title_pos.set_position([0.5,0.0])
plt.ylabel('Count Of PM2.5',color='red')
plt.xlabel('Country',color='red')
plt.show()
```

Top 3 Countries With Max Air Quality By PM2.5

## 6-SHOW THE BOTTOM 3 COUNTRY WITH MAXIMUM AIR QUALITY BY PM2.5

```
bottom_PM25_country=df.groupby('country')
['air_quality_PM2.5'].max().sort_values(ascending=False).tail(3)
bottom_PM25_country

country
Kiribati    5.7
Iceland     4.8
Tuvalu      4.6
Name: air_quality_PM2.5, dtype: float64

plt.figure(figsize=(7,7))
bottom_PM25_country=df.groupby('country')
['air_quality_PM2.5'].max().sort_values(ascending=False).tail(3)
bottom_PM25_country_sorted =
bottom_PM25_country.sort_values(ascending=True)
plt.step(x=bottom_PM25_country_sorted.index,y=bottom_PM25_country_sort
ed.values,color='violet',marker='o',
        markerfacecolor='Blue',markersize=10)
for x, y in zip(bottom_PM25_country.index,
bottom_PM25_country.values):
    y_rounded = round(y, 1)
    plt.annotate(f'{y_rounded}', (x, y), textcoords="offset
points",xytext=(0,8), ha='right')
```

```
title_pos=plt.title('Bottom 3 Countries With Max Air Quality By
PM2.5')
title_pos.set_position([0.5,0.0])
plt.ylabel('Count Of PM2.5',color='red')
plt.xlabel('Country',color='red')
plt.show()
```



Bottom 3 Countries With Max Air Quality By PM2.5
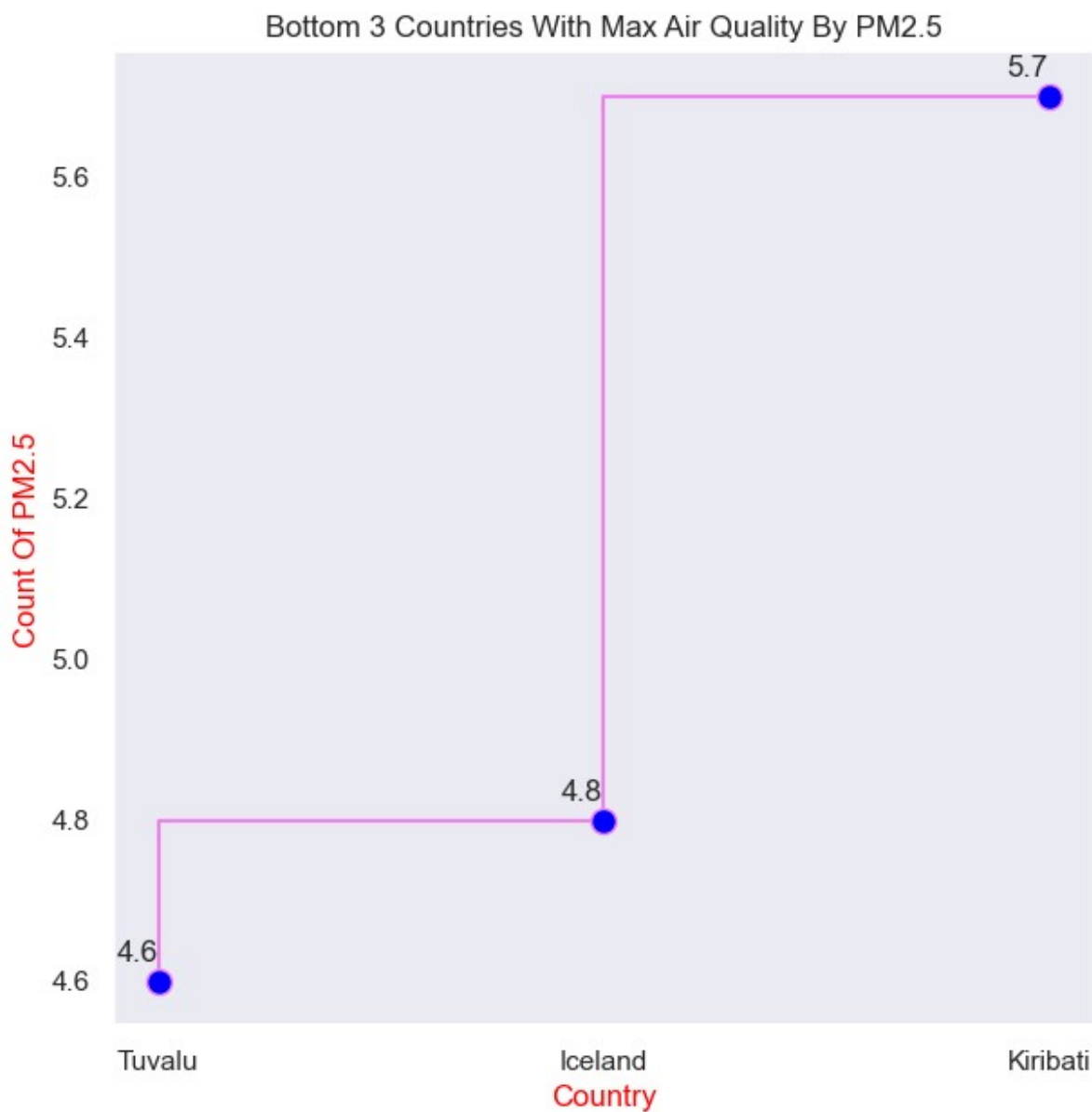
**FROM THIS DATA :**

I-INDONESIA (1558.8) IS THE TOP COUNTRY WITH AIR QUALITY BY PM2.5.

II-TUVALU (4.6) IS LOWEST COUNTRY WITH AIR QUALITY BY PM2.5.