#### WEATHER DAY VISUALIZATION

# CREATION OF DATA FRAME

```
In [91]: import matplotlib.pyplot as plt
         import seaborn as sns
         import pandas as pd
         data={
             "Date" : ["2025-6-1","2025-6-2","2025-6-13","2025-6-14","2025-6-15","
             "Temperature" : [30,32,31,29,31,32,28,33,31,30,29,34,35,29,31,30,34,3
             "Humidity (%)" : [70,75,71,65,68,79,77,79,67,77,81,82,76,65,66,59,81,
             "Rainfall (mm)" : [1.1,2.1,0.4,0.1,3.2,3.5,5.1,4.6,6.2,3.5,0.9,0.8,1.
             "Cities" : ["karachi","lahore","karachi","multan","islamabad","multan
         }
         weather=pd.DataFrame(data)
         print(weather),
```

```
          Date  Temperature  Humidity (%)  Rainfall (mm)     Cities
0     2025-6-1           30            70            1.1    karachi
1     2025-6-2           32            75            2.1     lahore
2    2025-6-13           31            71            0.4    karachi
3    2025-6-14           29            65            0.1     multan
4    2025-6-15           31            68            3.2  islamabad
5     2025-7-1           32            79            3.5     multan
6     2025-7-2           28            77            5.1  hyderabad
7     2025-7-3           33            79            4.6    karachi
8     2025-7-4           31            67            6.2    karachi
9     2025-7-5           30            77            3.5     lahore
10    2025-7-6           29            81            0.9     quetta
11   2025-7-15           34            82            0.8     multan
12   2025-7-18           35            76            1.4  hyderabad
13   2025-7-29           29            65            2.5   peshawar
14    2025-8-5           31            66            4.5     multan
15   2025-8-10           30            59            5.2    karachi
16   2025-8-11           34            81            3.7  islamabad
17   2025-8-13           33            83            2.5     quetta
18   2025-8-19           29            68            3.1     lahore
19   2025-8-21           32            71            4.0    karachi
```

```
Out[91]: (None,)
```

# SOME STATS DESCRIPTION

```
In [92]: print(weather.describe())
```

```
       Temperature  Humidity (%)  Rainfall (mm)
count    20.000000     20.000000      20.000000
mean     31.150000     73.000000       2.920000
std       1.954078      6.890115       1.748864
min      28.000000     59.000000       0.100000
25%      29.750000     67.750000       1.325000
50%      31.000000     73.000000       3.150000
75%      32.250000     79.000000       4.125000
max      35.000000     83.000000       6.200000
```

# INFORMATION ABOUT DATAFRAME

```
In [93]: print(weather.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 20 entries, 0 to 19
Data columns (total 5 columns):
 #   Column         Non-Null Count  Dtype  
---  ------         --------------  -----  
 0   Date           20 non-null     object 
 1   Temperature    20 non-null     int64  
 2   Humidity (%)   20 non-null     int64  
 3   Rainfall (mm)  20 non-null     float64
 4   Cities         20 non-null     object 
dtypes: float64(1), int64(2), object(2)
memory usage: 932.0+ bytes
None
```

# SORTING FUNCTION

```
In [94]: print(weather['Rainfall (mm)'].sort_values(ascending=True))
```

```
3     0.1
2     0.4
11    0.8
10    0.9
0     1.1
12    1.4
1     2.1
13    2.5
17    2.5
18    3.1
4     3.2
9     3.5
5     3.5
16    3.7
19    4.0
14    4.5
7     4.6
6     5.1
15    5.2
8     6.2
Name: Rainfall (mm), dtype: float64
```

# GROUPBY FUNCTIONS

```
In [95]: print(weather.groupby(["Date","Rainfall (mm)"])["Temperature"].mean())
```

```
Date       Rainfall (mm)
2025-6-1   1.1              30.0
2025-6-13  0.4              31.0
2025-6-14  0.1              29.0
2025-6-15  3.2              31.0
2025-6-2   2.1              32.0
2025-7-1   3.5              32.0
2025-7-15  0.8              34.0
2025-7-18  1.4              35.0
2025-7-2   5.1              28.0
2025-7-29  2.5              29.0
2025-7-3   4.6              33.0
2025-7-4   6.2              31.0
2025-7-5   3.5              30.0
2025-7-6   0.9              29.0
2025-8-10  5.2              30.0
2025-8-11  3.7              34.0
2025-8-13  2.5              33.0
2025-8-19  3.1              29.0
2025-8-21  4.0              32.0
2025-8-5   4.5              31.0
Name: Temperature, dtype: float64
```

```
In [ ]: print(weather.groupby("Cities")["Date"].count())
```

```
Cities
hyderabad    2
islamabad    2
karachi      6
lahore       3
multan       4
peshawar     1
quetta       2
Name: Date, dtype: int64
```

# MODIFICATION OF GROUPBY FUNCTION (PIVOT TABLE)

```
In [96]: print(weather.pivot_table(values="Temperature",index="Date",columns="Rain
Rainfall (mm)   0.1   0.4   0.8   0.9   1.1   1.4   2.1   2.5   3.1   3.2  \
Date
2025-6-1        0.0   0.0   0.0   0.0  30.0   0.0   0.0   0.0   0.0   0.0
2025-6-13       0.0  31.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-6-14      29.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-6-15       0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0  31.0
2025-6-2        0.0   0.0   0.0   0.0   0.0   0.0  32.0   0.0   0.0   0.0
2025-7-1        0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-7-15       0.0   0.0  34.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-7-18       0.0   0.0   0.0   0.0   0.0  35.0   0.0   0.0   0.0   0.0
2025-7-2        0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-7-29       0.0   0.0   0.0   0.0   0.0   0.0   0.0  29.0   0.0   0.0
2025-7-3        0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-7-4        0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-7-5        0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-7-6        0.0   0.0   0.0  29.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-8-10       0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-8-11       0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-8-13       0.0   0.0   0.0   0.0   0.0   0.0   0.0  33.0   0.0   0.0
2025-8-19       0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0  29.0   0.0
2025-8-21       0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-8-5        0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0

Rainfall (mm)   3.5   3.7   4.0   4.5   4.6   5.1   5.2   6.2
Date
2025-6-1        0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-6-13       0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-6-14       0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-6-15       0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-6-2        0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-7-1       32.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-7-15       0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-7-18       0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-7-2        0.0   0.0   0.0   0.0   0.0  28.0   0.0   0.0
2025-7-29       0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-7-3        0.0   0.0   0.0   0.0  33.0   0.0   0.0   0.0
2025-7-4        0.0   0.0   0.0   0.0   0.0   0.0   0.0  31.0
2025-7-5       30.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-7-6        0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-8-10       0.0   0.0   0.0   0.0   0.0   0.0  30.0   0.0
2025-8-11       0.0  34.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-8-13       0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-8-19       0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2025-8-21       0.0   0.0  32.0   0.0   0.0   0.0   0.0   0.0
2025-8-5        0.0   0.0   0.0  31.0   0.0   0.0   0.0   0.0
```

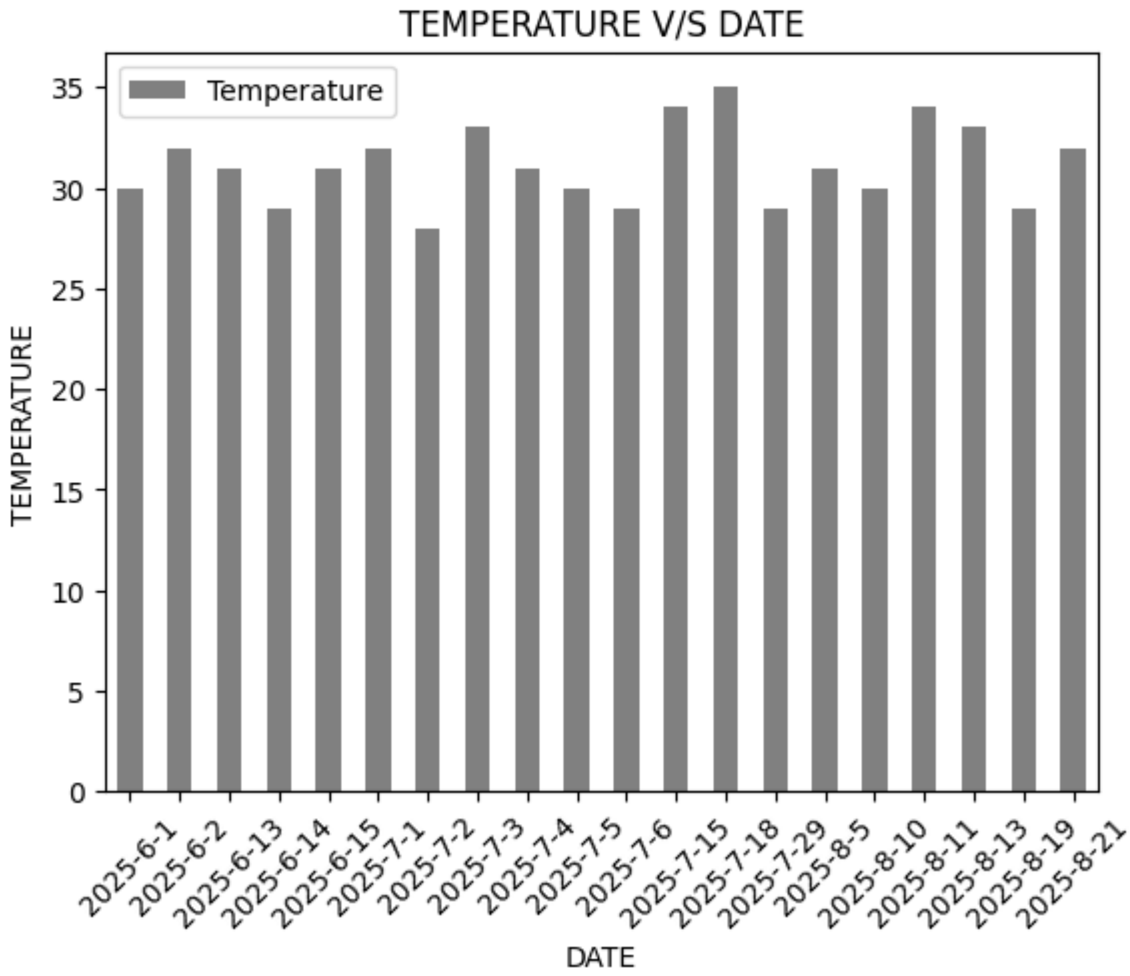
# SET_INDEX FUNCTION

```
In [97]: print(weather.set_index("Date"))
```

```
           Temperature  Humidity (%)  Rainfall (mm)     Cities
Date
2025-6-1            30            70            1.1    karachi
2025-6-2            32            75            2.1     lahore
2025-6-13           31            71            0.4    karachi
2025-6-14           29            65            0.1     multan
2025-6-15           31            68            3.2  islamabad
2025-7-1            32            79            3.5     multan
2025-7-2            28            77            5.1  hyderabad
2025-7-3            33            79            4.6    karachi
2025-7-4            31            67            6.2    karachi
2025-7-5            30            77            3.5     lahore
2025-7-6            29            81            0.9     quetta
2025-7-15           34            82            0.8     multan
2025-7-18           35            76            1.4  hyderabad
2025-7-29           29            65            2.5   peshawar
2025-8-5            31            66            4.5     multan
2025-8-10           30            59            5.2    karachi
2025-8-11           34            81            3.7  islamabad
2025-8-13           33            83            2.5     quetta
2025-8-19           29            68            3.1     lahore
2025-8-21           32            71            4.0    karachi
```

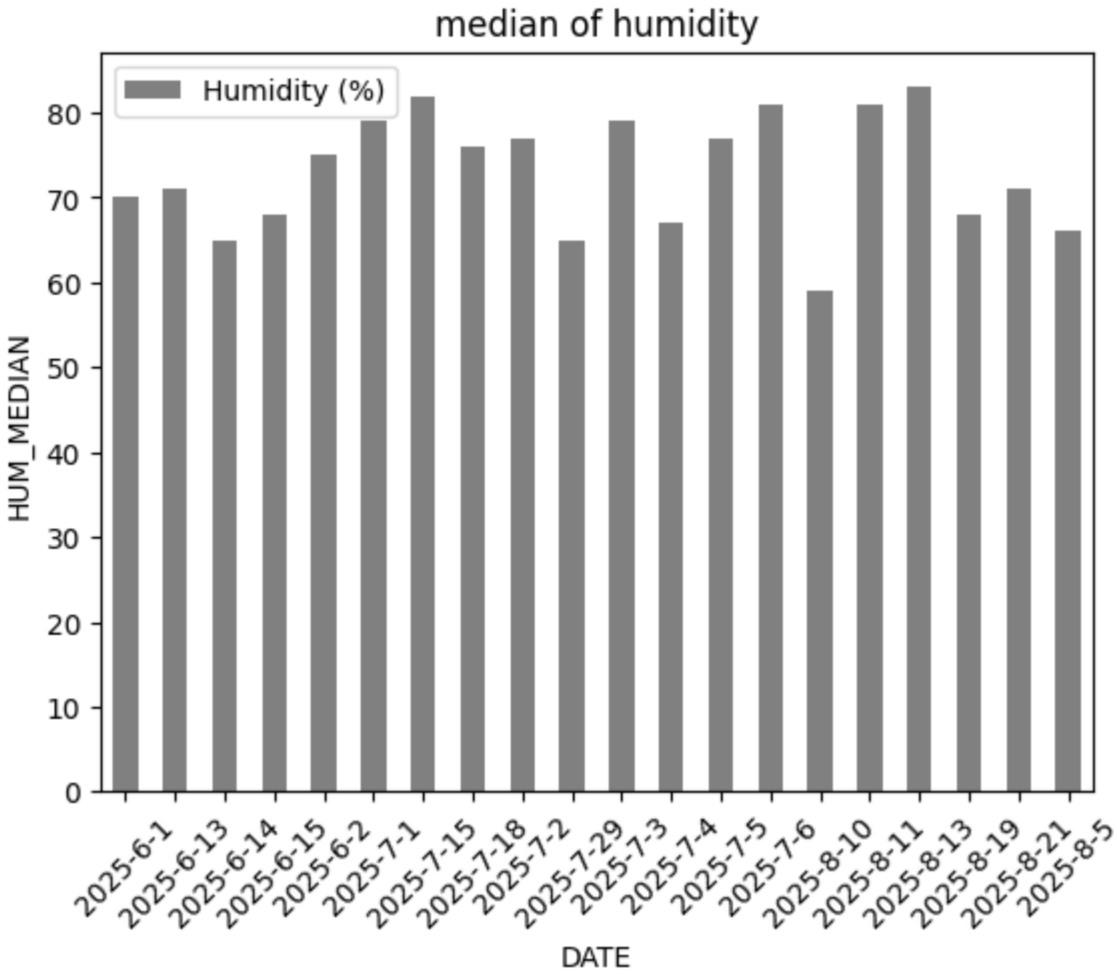
# BAR PLOTS

```
In [112… weather.plot(kind="bar",x="Date",y="Temperature",title="TEMPERATURE V/S D
         plt.xlabel("DATE")
         plt.ylabel("TEMPERATURE")
         plt.show()
```



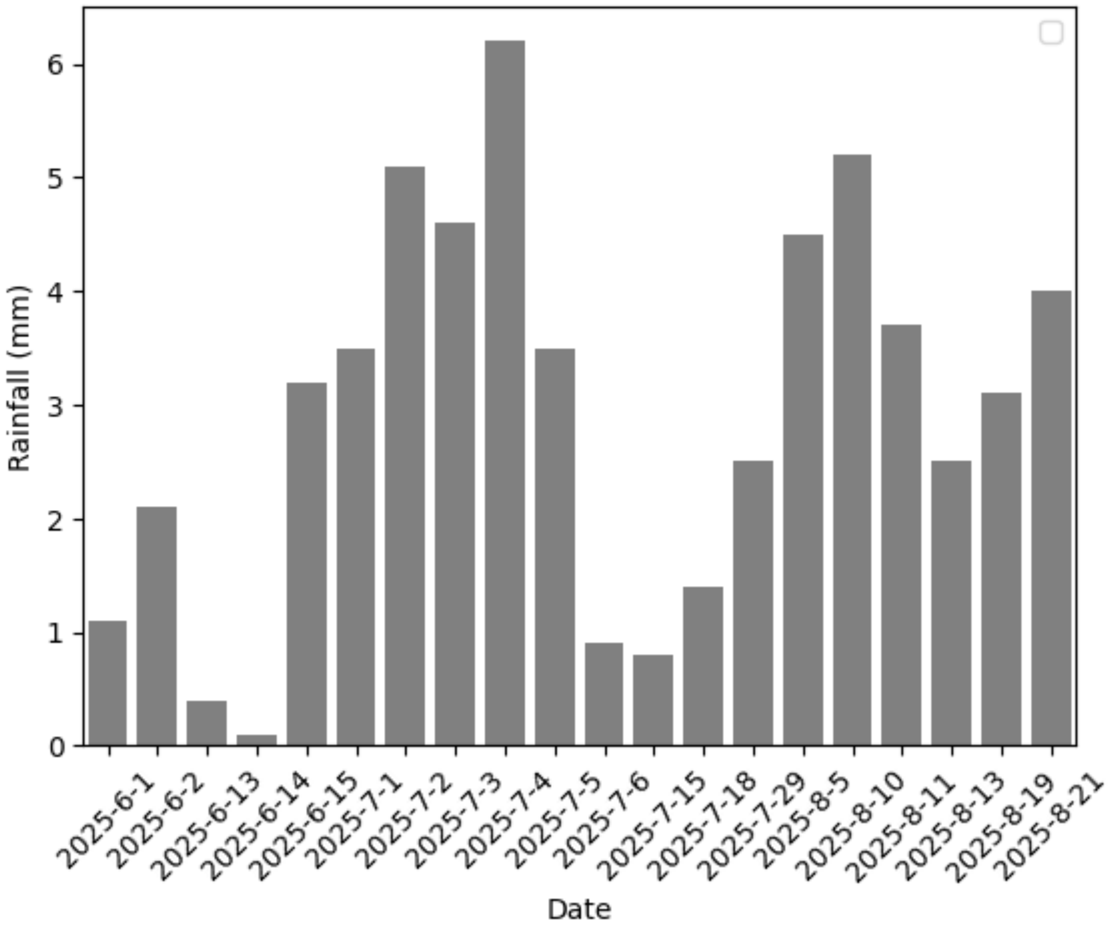
```
In [99]: hum_median= weather.groupby("Date")["Humidity (%)"].median()
         print(hum_median)
         hum_median.plot(kind="bar",title="median of humidity",rot=45,color="grey"
         plt.xlabel("DATE")
         plt.ylabel("HUM_MEDIAN")
         plt.legend()
         plt.show()
```

```
Date
2025-6-1     70.0
2025-6-13    71.0
2025-6-14    65.0
2025-6-15    68.0
2025-6-2     75.0
2025-7-1     79.0
2025-7-15    82.0
2025-7-18    76.0
2025-7-2     77.0
2025-7-29    65.0
2025-7-3     79.0
2025-7-4     67.0
2025-7-5     77.0
2025-7-6     81.0
2025-8-10    59.0
2025-8-11    81.0
2025-8-13    83.0
2025-8-19    68.0
2025-8-21    71.0
2025-8-5     66.0
Name: Humidity (%), dtype: float64
```



```
In [114…  sns.barplot(data=weather,x="Date",y="Rainfall (mm)",color="grey")
          plt.xticks(rotation=45)
          plt.show()
```

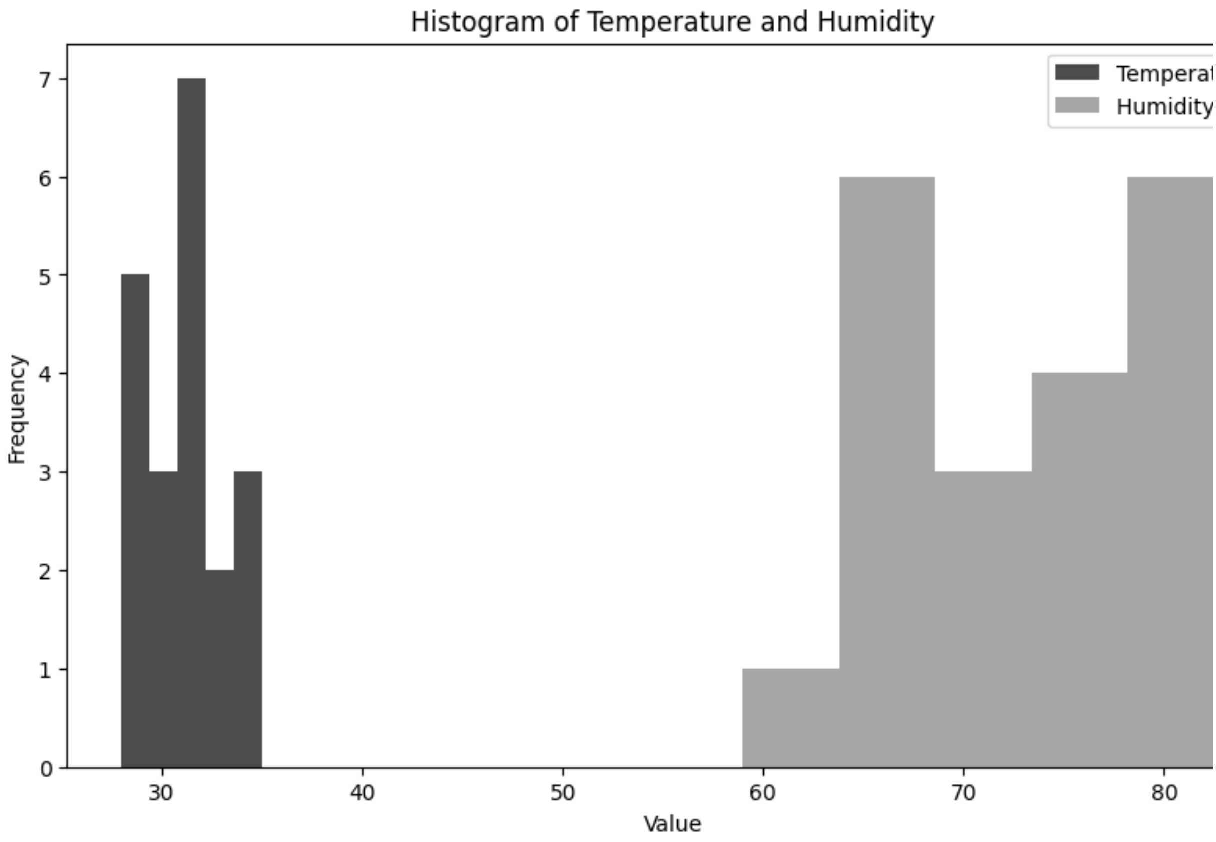
```
/tmp/ipython-input-114-4082705984.py:3: UserWarning: No artists with labels f
to put in legend.  Note that artists whose label start with an underscore are
ignored when legend() is called with no argument.
  plt.legend()
```



# HISTOGRAM

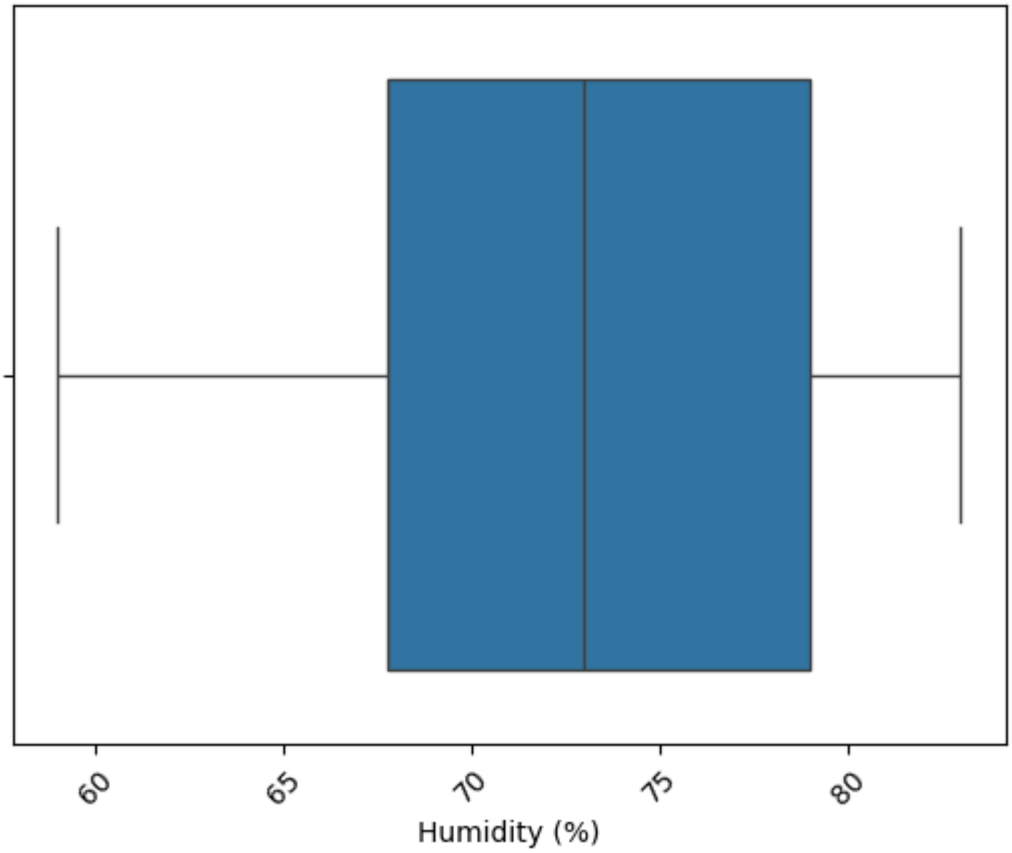
In [100…

```
temperature = data["Temperature"]
humidity = data["Humidity (%)"]

plt.figure(figsize=(10, 6))
plt.hist(temperature, bins=5, alpha=0.7, label='Temperature', color='black
plt.hist(humidity, bins=5, alpha=0.7, label='Humidity (%)', color='grey')

plt.xlabel('Value')
plt.ylabel('Frequency')
plt.title('Histogram of Temperature and Humidity')
plt.legend()
plt.grid(False)
plt.show()
```

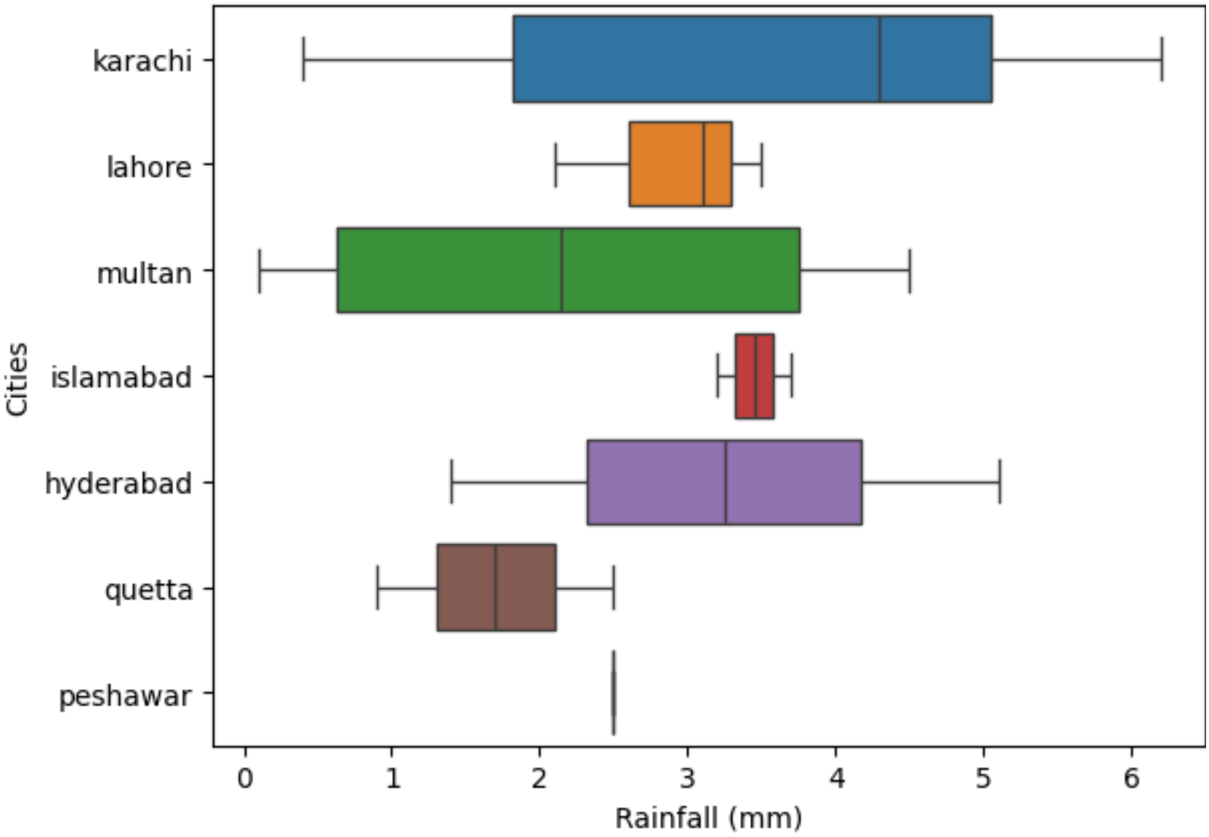


# BOX PLOTS

```
In [102…  sns.boxplot(data=weather,x="Humidity (%)")
          plt.xticks(rotation=45)
          plt.show()
```



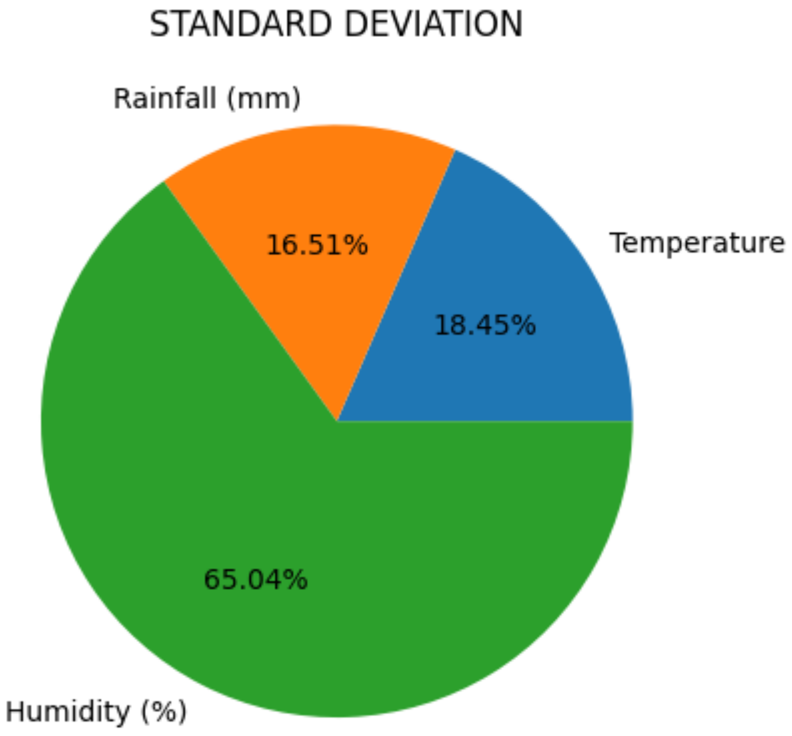
```
In [ ]: sns.boxplot(data=weather,x="Rainfall (mm)",y="Cities",hue="Cities")
        plt.show()
```



# PIE CHART

In [103…

```
x=weather["Temperature"].std()
y=weather["Rainfall (mm)"].std()
z=weather["Humidity (%)"].std()
labels=["Temperature","Rainfall (mm)","Humidity (%)"]
sizes=[x,y,z]
plt.pie(sizes,labels=labels,autopct="%1.2f%%")
plt.title("STANDARD DEVIATION")
plt.show()
```



# ISNULL FUNCTION

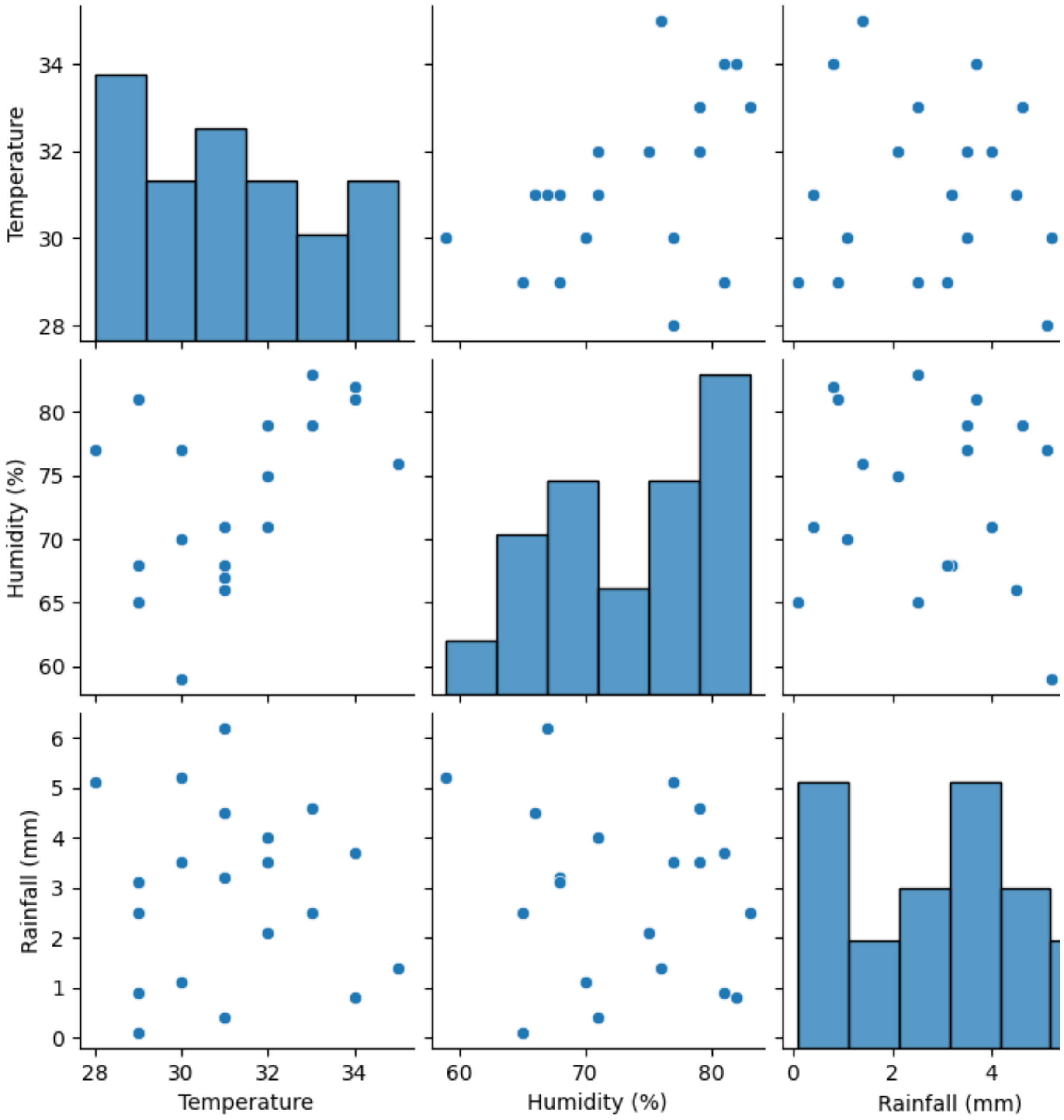
In [105…

```
print(weather.isna())
```

```
     Date  Temperature  Humidity (%)  Rainfall (mm)  Cities
0   False        False         False          False   False
1   False        False         False          False   False
2   False        False         False          False   False
3   False        False         False          False   False
4   False        False         False          False   False
5   False        False         False          False   False
6   False        False         False          False   False
7   False        False         False          False   False
8   False        False         False          False   False
9   False        False         False          False   False
10  False        False         False          False   False
11  False        False         False          False   False
12  False        False         False          False   False
13  False        False         False          False   False
14  False        False         False          False   False
15  False        False         False          False   False
16  False        False         False          False   False
17  False        False         False          False   False
18  False        False         False          False   False
19  False        False         False          False   False
```

# PAIR PLOTS

```
In [107…  sns.pairplot(weather)
          plt.show()
```



# CATEGORICAL FUNCTIONS

```
In [108… print(weather["Cities"].nunique())
```

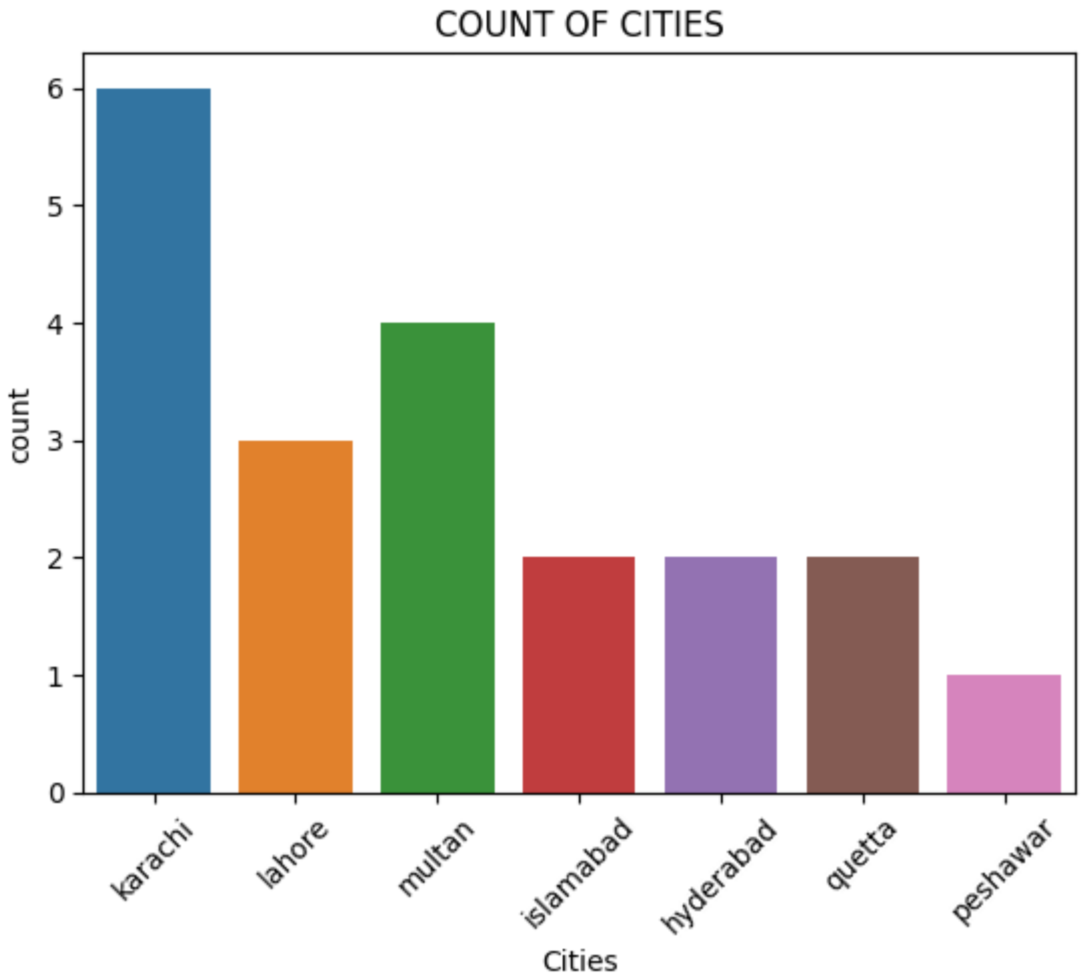
```
7
```

```
In [109… print(weather["Cities"].str.contains("karachi"))
```

```
0      True
1     False
2      True
3     False
4     False
5     False
6     False
7      True
8      True
9     False
10    False
11    False
12    False
13    False
14    False
15     True
16    False
17    False
18    False
19     True
Name: Cities, dtype: bool
```

# COUNT PLOT

```
In [110…  sns.countplot(data=weather,x="Cities",hue="Cities")
          plt.xticks(rotation=45)
          plt.title("COUNT OF CITIES")
          plt.show()
```


COUNT OF CITIES
count
0
1
2
3
4
5
6
karachi
lahore
multan
islamabad
hyderabad
quetta
peshawar
Cities