PROBLEM STATMENT:- Using machine learning concepts, need to predict the weather condition.The weather condition may be drizzle,rain,sun,snow,fog. This weather condition are decided by year and month.

Description:- The Weather Dataset is a information about the weather condition of Month. It records precipitation, maximum temperature, miniimum temperature, Wind speed. This Dataset available as a csv file. We are going to analyze this dataset using Panda's data frame.

About Dataset:- Using the Columns :

- precipitation
- tempmax
- tempmin
- wind

OBJECTIVE:- We are going to predict the weather condition :

- drizzle
- rain
- sun
- snow
- fog

In [ ]:
```
Importing the Essential Libraries
```

In [ ]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
import io
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.metrics import confusion_matrix, accuracy_score
from sklearn.metrics import classification_report
```

In [ ]:
```
Loading the Data using CSV file
```

In [ ]:
```
df= pd.read_csv("C:\\Users\\HP\\Downloads\\weather.csv")
print(df)
```

In [2]:
```
df.head()
```

Out[2]:

	date	precipitation	temp_max	temp_min	wind	weather
0	1/1/2012	0.0	12.8	5.0	4.7	drizzle
1	1/2/2012	10.9	10.6	2.8	4.5	rain
2	1/3/2012	0.8	11.7	7.2	2.3	rain
3	1/4/2012	20.3	12.2	5.6	4.7	rain
4	1/5/2012	1.3	8.9	2.8	6.1	rain

In [3]:
```
df.tail()
```

Out[3]:

	date	precipitation	temp_max	temp_min	wind	weather
1456	12/27/2015	8.6	4.4	1.7	2.9	rain
1457	12/28/2015	1.5	5.0	1.7	1.3	rain
1458	12/29/2015	0.0	7.2	0.6	2.6	fog
1459	12/30/2015	0.0	5.6	-1.0	3.4	sun
1460	12/31/2015	0.0	5.6	-2.1	3.5	sun

In [ ]:
```
info():
The information contains the number of columns, column labels, column data types, memory usage, range index,
and the number of cells in each column (non-null values).
```

In [4]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1461 entries, 0 to 1460
Data columns (total 6 columns):
 #   Column         Non-Null Count  Dtype  
---  ------         --------------  -----  
 0   date           1461 non-null   object 
 1   precipitation  1461 non-null   float64
 2   temp_max       1461 non-null   float64
 3   temp_min       1461 non-null   float64
 4   wind           1461 non-null   float64
 5   weather        1461 non-null   object 
dtypes: float64(4), object(2)
memory usage: 68.6+ KB
```

In [5]:
```
df.columns
```

Out[5]:
```
Index(['date', 'precipitation', 'temp_max', 'temp_min', 'wind', 'weather'], dtype='object')
```

In [6]:
```
#count - The number of not-empty values.
#mean - The average (mean) value.
#std - The standard deviation.
#min - the minimum value.
#25% - The 25% percentile*.
#50% - The 50% percentile*.
#75% - The 75% percentile*.
#max - the maximum value.
df.describe()
```

Out[6]:

	precipitation	temp_max	temp_min	wind
count	1461.000000	1461.000000	1461.000000	1461.000000
mean	3.029432	16.439083	8.234771	3.241136
std	6.680194	7.349758	5.023004	1.437825
min	0.000000	-1.600000	-7.100000	0.400000
25%	0.000000	10.600000	4.400000	2.200000
50%	0.000000	15.600000	8.300000	3.000000
75%	2.800000	22.200000	12.200000	4.000000
max	55.900000	35.600000	18.300000	9.500000

In [ ]:
```
Checking for missing or nan values
```

In [7]:
```
df.isnull()
df.isnull().min()
```

Out[7]:
```
date             False
precipitation    False
temp_max         False
temp_min         False
wind             False
weather          False
dtype: bool
```

In [8]:
```
df.isnull().max()
```

Out[8]:
```
date             False
precipitation    False
temp_max         False
temp_min         False
wind             False
weather          False
dtype: bool
```

In [ ]:
```
Get the count of missing values in each column of a dataframe.
```

In [9]:
```
df.isnull().sum()
```

Out[9]:
```
date             0
precipitation    0
temp_max         0
temp_min         0
wind             0
weather          0
dtype: int64
```

In [ ]:
```
Pandas sample() is used to generate a sample random row or column from the function caller data frame
```

In [10]:
```
df.sample(10)
```

Out[10]:

	date	precipitation	temp_max	temp_min	wind	weather
1068	12/4/2014	0.8	8.3	3.9	1.1	rain
929	7/18/2014	0.0	23.9	11.7	2.8	sun
375	1/10/2013	0.3	3.3	-0.6	2.1	snow
1401	11/2/2015	0.3	11.1	7.2	2.8	rain
618	9/10/2013	0.0	26.7	15.0	3.7	sun
643	10/5/2013	0.0	20.0	8.3	1.6	sun
72	3/13/2012	9.4	5.6	0.6	5.3	snow
200	7/19/2012	0.0	25.0	14.4	2.2	sun
713	12/14/2013	0.0	9.4	6.1	3.7	sun
891	6/10/2014	0.0	20.0	12.2	2.9	sun

In [ ]:
```
The nunique() method returns the number of unique values for each column.
```

In [11]:
```
df.nunique()
```

Out[11]:
```
date             1461
precipitation     111
temp_max           67
temp_min           55
wind               79
weather             5
dtype: int64
```

In [ ]:
```
The duplicated() method returns a Series with True and False values that describe which rows in the DataFrame are dup
and not.
```

In [12]:
```
df[df.duplicated()]
```

Out[12]:

date	precipitation	temp_max	temp_min	wind	weather

In [13]:
```
#data cleaning
df.drop_duplicates(inplace=True)
df.reset_index(drop=True, inplace=True)
df.shape
```

Out[13]:
```
(1461, 6)
```

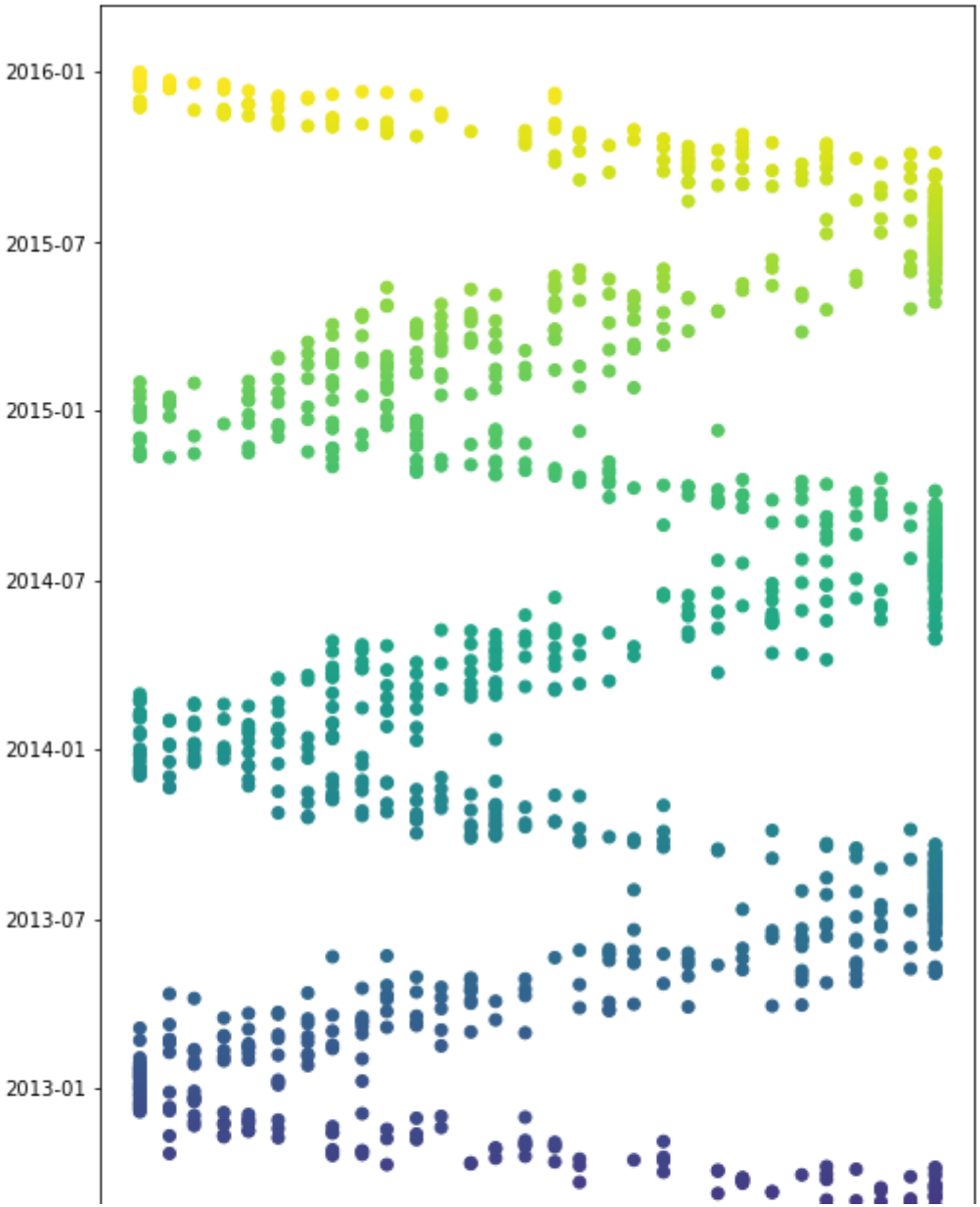
In [14]:
```
#Now converting data data type to date time format
df['date'] = pd.to_datetime(df['date'])
df['date']
```

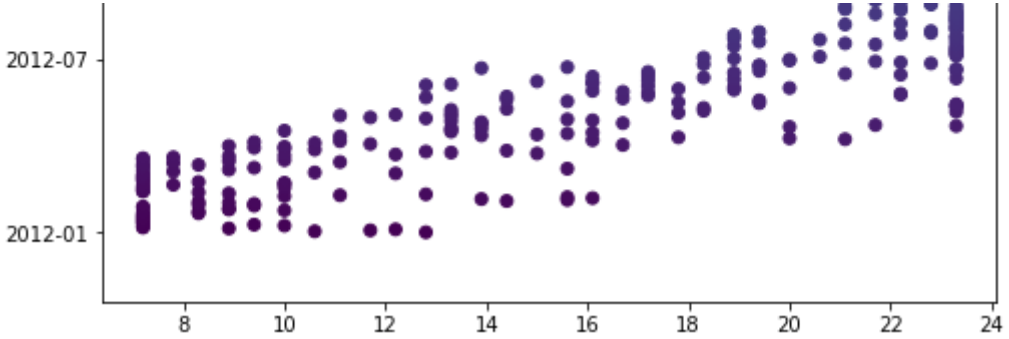
Out[14]:
```
0      2012-01-01
1      2012-01-02
2      2012-01-03
3      2012-01-04
4      2012-01-05
          ...
1456   2015-12-27
1457   2015-12-28
1458   2015-12-29
1459   2015-12-30
1460   2015-12-31
Name: date, Length: 1461, dtype: datetime64[ns]
```

In [ ]:
```
DATA VISUALISATION:-
For data visualisation we use MATPLOTLIB & SEABORN libraries.
MATPLOTLIB:-
     Matplotlib is an amazing visualization library in Python for 2D plots of arrays.
     Matplotlib consists of several plots like line, bar, scatter, histogram etc.
SEABORN:-
    Seaborn is an amazing visualization library for statistical graphics plotting in Python.
    It provides beautiful default styles and color palettes to make statistical plots more attractive.
```

In [ ]:
```
Finding the Maximum temperature by date(year)
```

In [46]:
```
color = np.arange(0,1461)
plt.figure(figsize=(8,14))
plt.scatter(data=df,x='temp_max',y='date',c=color)#,cmap='inferno')
plt.show()
```

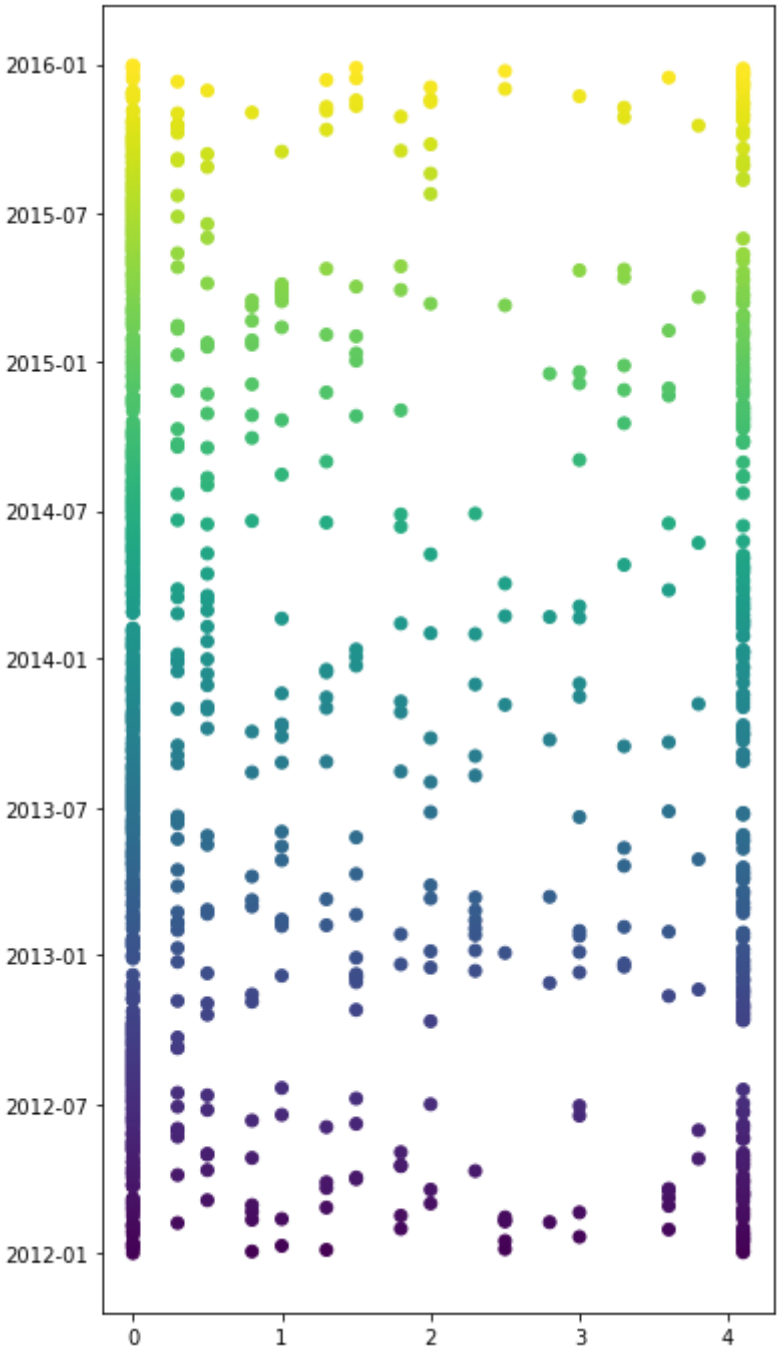




In [ ]:
```
Finding the Precipitation temperature by year(year)
```

In [47]:

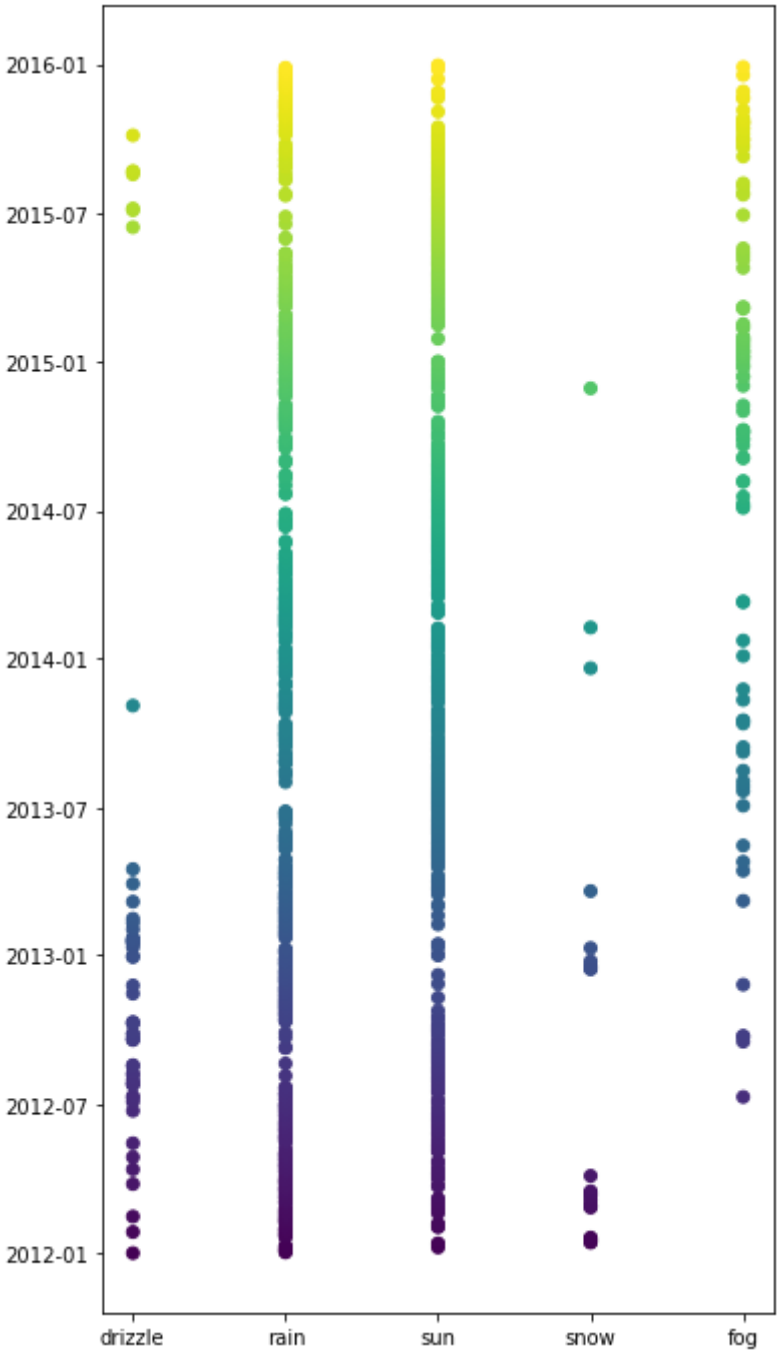
```
color = np.arange(0,1461)
plt.figure(figsize=(6,12))
plt.scatter(data=df,x='precipitation',y='date',c=color)#,cmap='plasma')
plt.show()
```


2016-01
2015-07
2015-01
2014-07
2014-01
2013-07
2013-01
2012-07
2012-01
0
1
2
3
4

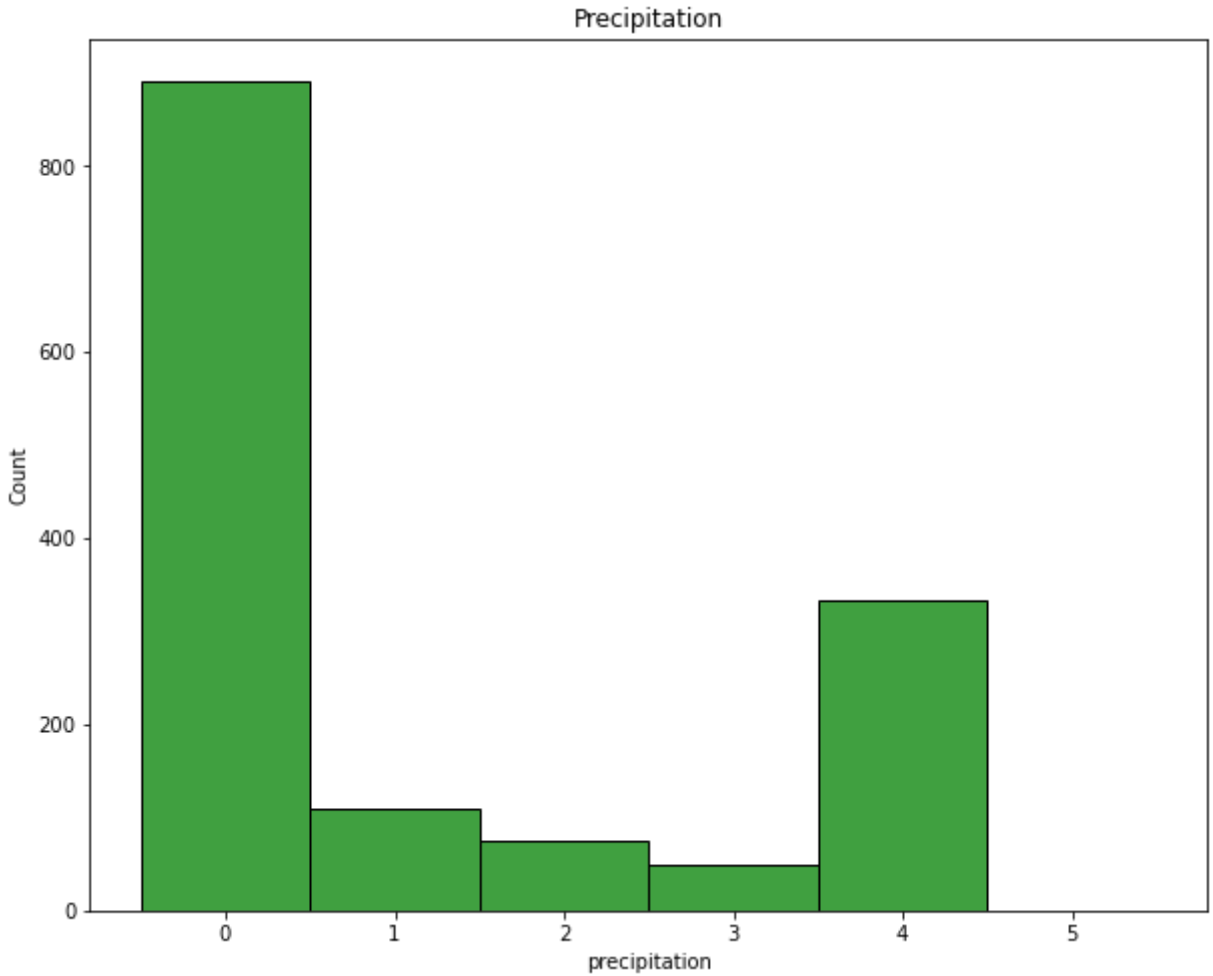
In [ ]:
```
Finding the Maximum weather by date(year)
```

In [48]:

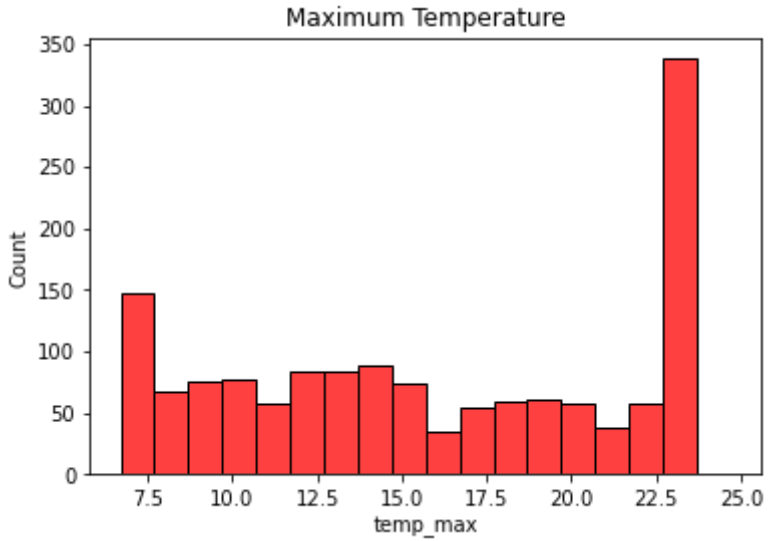
```
color = np.arange(0,1461)
plt.figure(figsize=(6,12))
plt.scatter(data=df,x='weather',y='date',c=color)#,cmap='plasma')
plt.show()
```


2016-01
2015-07
2015-01
2014-07
2014-01
2013-07
2013-01
2012-07
2012-01
drizzle
rain
sun
snow
fog

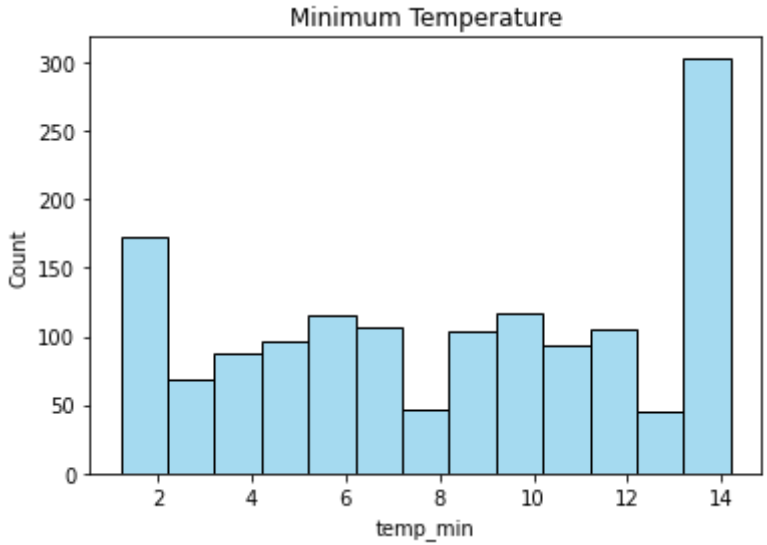
In [52]:
```
#precipitation
plt.figure(figsize=(10,8))
sns.histplot(df.precipitation,discrete=True,color='green')
plt.title('Precipitation')
plt.show()
```



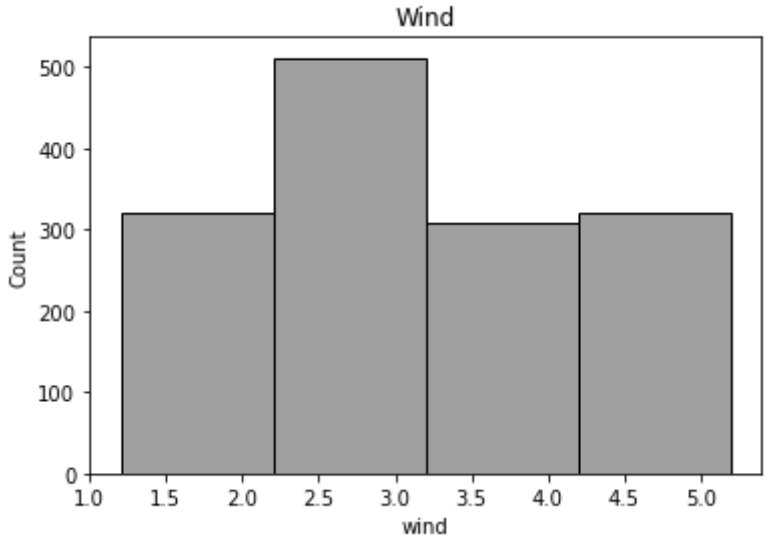
In [53]:
```
#max_temp
sns.histplot(df.temp_max, discrete=True,color='red')
plt.title('Maximum Temperature')
plt.show()
```



In [54]:
```
#min_temp
sns.histplot(df.temp_min, discrete=True,color='skyblue')
plt.title('Minimum Temperature')
plt.show()
```

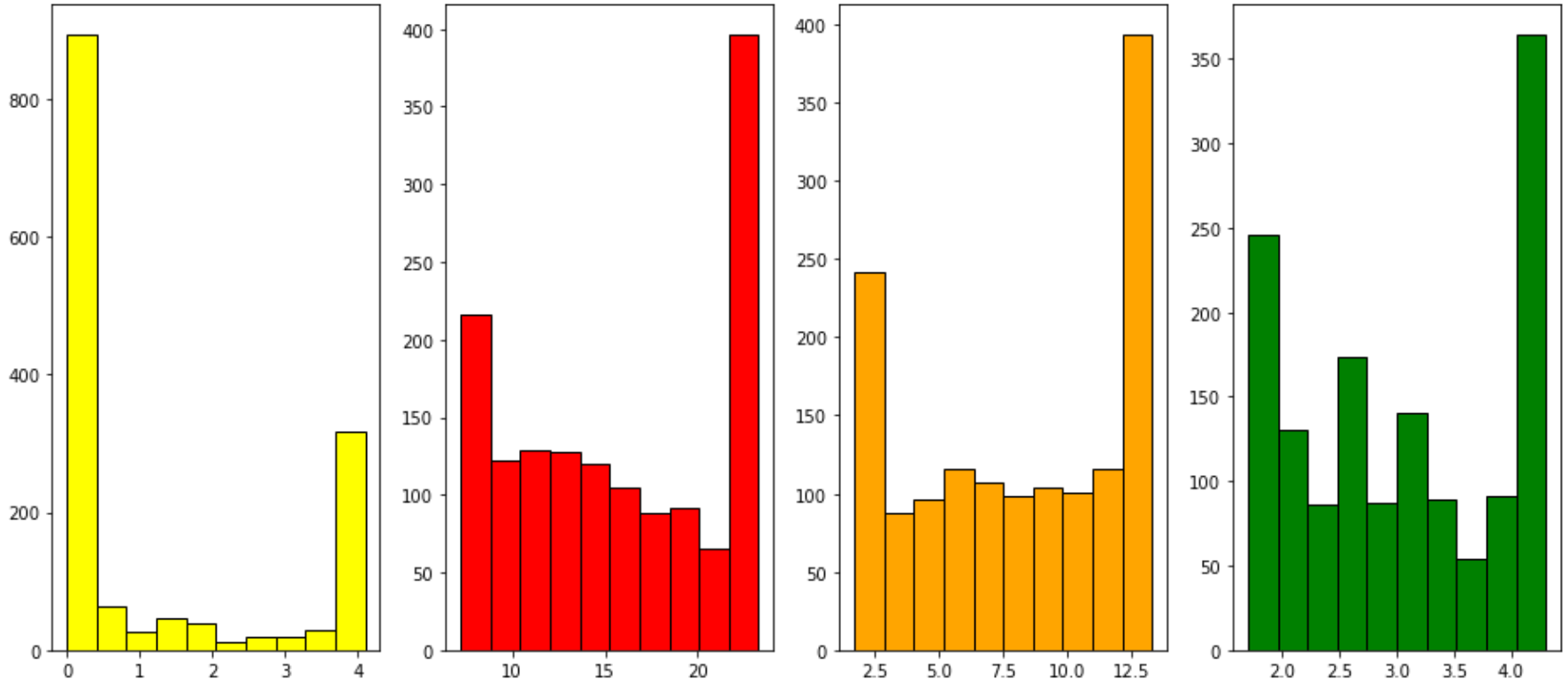


In [55]:
```
#wind
sns.histplot(df.wind, discrete=True,color='grey')
plt.title('Wind')
plt.show()
```



In [ ]:
```
subplot of all numeric coloumn
```

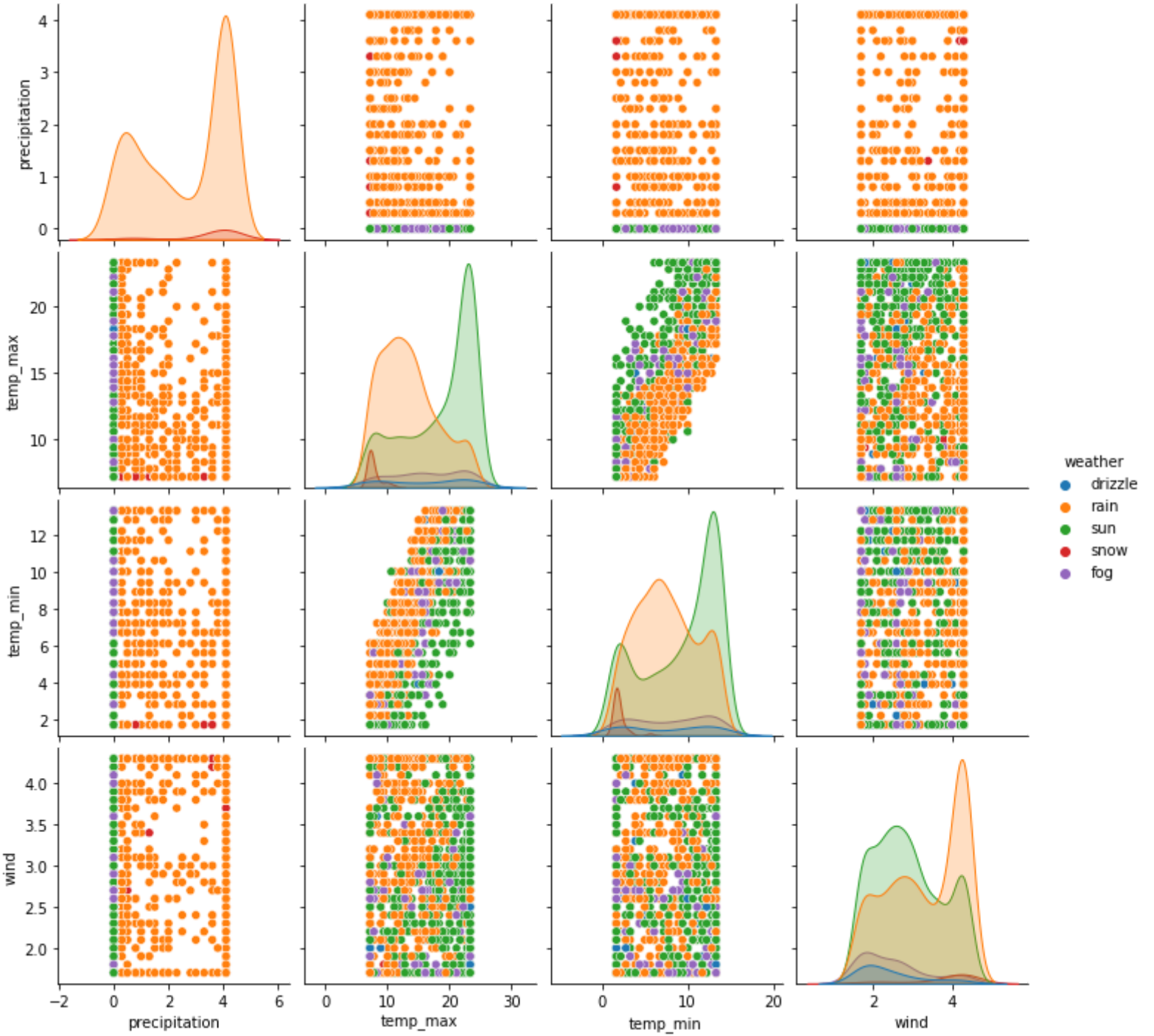
In [49]:
```
plt.figure(figsize=(16,7))
plt.subplot(1,4,1)
plt.hist(df['precipitation'],color='yellow',ec='black')


plt.subplot(1,4,2)
plt.hist(df['temp_max'],color='red',ec='black')


plt.subplot(1,4,3)
plt.hist(df['temp_min'],color='orange',ec='black')


plt.subplot(1,4,4)
plt.hist(df['wind'],color='green',ec='black')
plt.show()
```



In [ ]:
```
pairplot for numeric columns with seaborn
```

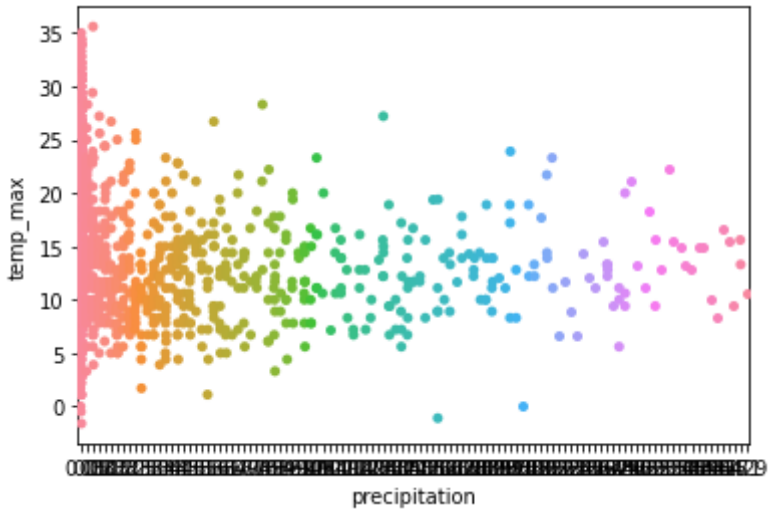
In [60]:
```
# sns.pairplot(df[['precipitation','temp_max','temp_min','wind']])
plt.figure(figsize=(14,8))
sns.pairplot(df.drop('date',axis=1),hue='weather')
plt.show()
```

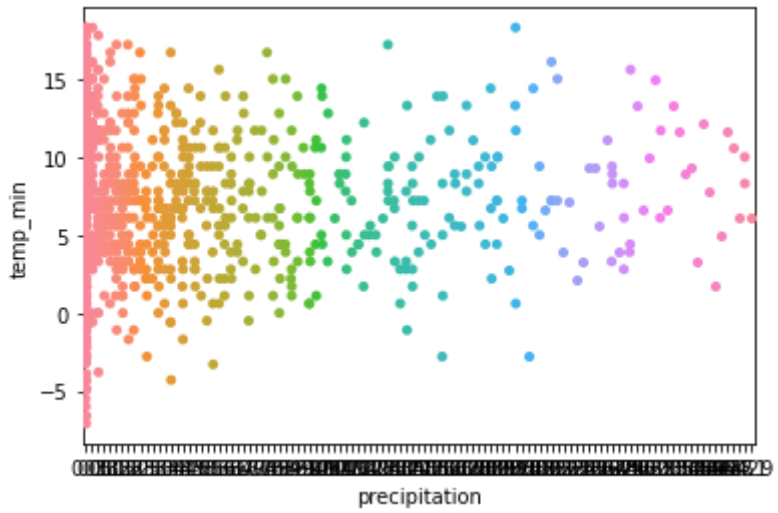
```
<Figure size 1008x576 with 0 Axes>
```


precipitation
temp_max
temp_min
wind
weather
drizzle
rain
sun
snow
fog

In [ ]:
```
Plot between the maximum temp, minimum temp by precipitation
```

In [26]:
```
sns.stripplot(x='precipitation',y='temp_max',data=df)
plt.show()
sns.stripplot(x='precipitation',y='temp_min',data=df)
plt.show()
```



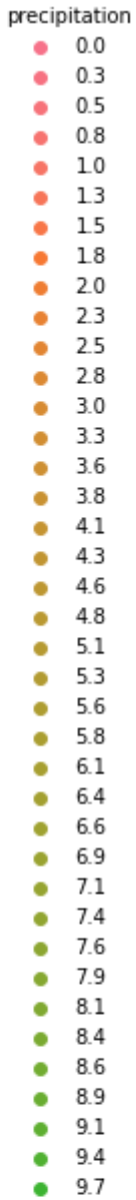


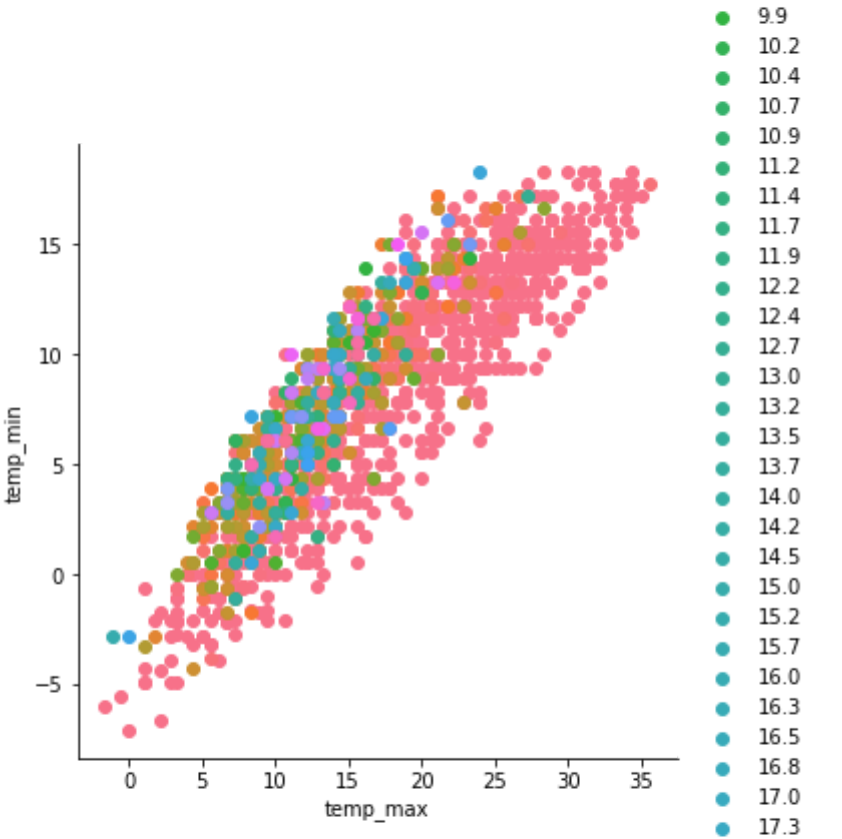
In [ ]:

```
FacetGrid helps in visualizing distribution of one variable
as well as the relationship between multiple variables separately within subsets of your dataset using multiple panel
```

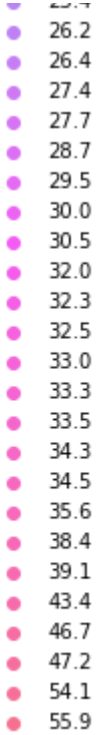
In [27]:
```
sns.FacetGrid(df, hue="precipitation", height=5) \
   .map(plt.scatter, "temp_max","temp_min") \
   .add_legend()
```

Out[27]: <seaborn.axisgrid.FacetGrid at 0x2ce374568b0>





9.9
10.2
10.4
10.7
10.9
11.2
11.4
11.7
11.9
12.2
12.4
12.7
13.0
13.2
13.5
13.7
14.0
14.2
14.5
15.0
15.2
15.7
16.0
16.3
16.5
16.8
17.0
17.3
18.3
18.5
18.8
19.1
19.3
19.6
19.8
20.3
20.6
20.8
21.3
21.6
21.8
22.1
22.4
22.6
23.1
23.6
23.9
25.4



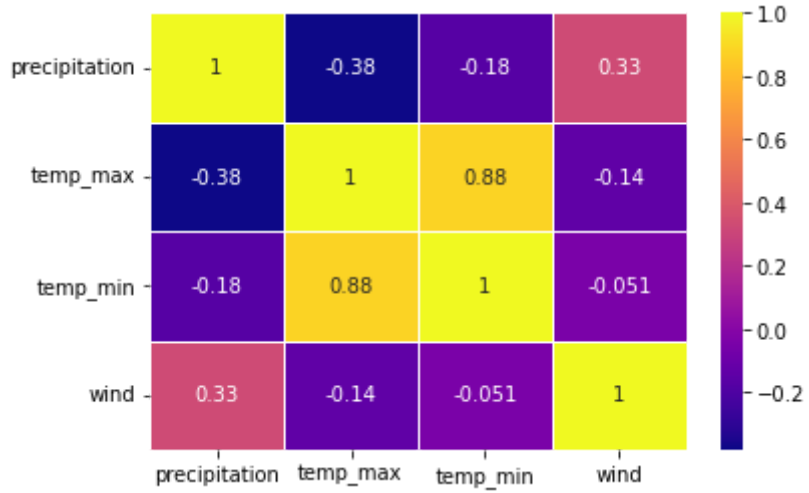
In [50]:
```
#correlation (relationship) between each column in the DataFrame
c=df.corr()
c
```

Out[50]:

	precipitation	temp_max	temp_min	wind
precipitation	1.000000	-0.381236	-0.175422	0.327567
temp_max	-0.381236	1.000000	0.877862	-0.139603
temp_min	-0.175422	0.877862	1.000000	-0.051121
wind	0.327567	-0.139603	-0.051121	1.000000

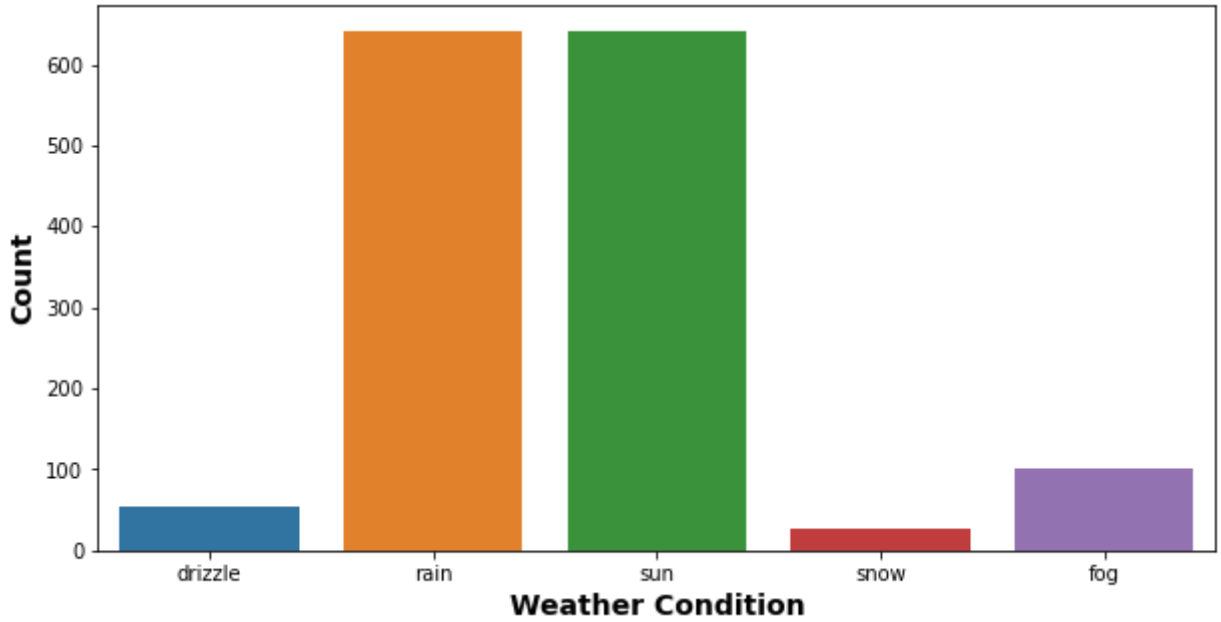
In [51]:
```
sns.heatmap(c,annot=True,linewidths=1,cmap='plasma')
print("*"*20,"#"*15,"*"*20)
plt.show()
print("*"*20,"#"*15,"*"*20)
```

```
******************** ############### ********************
```



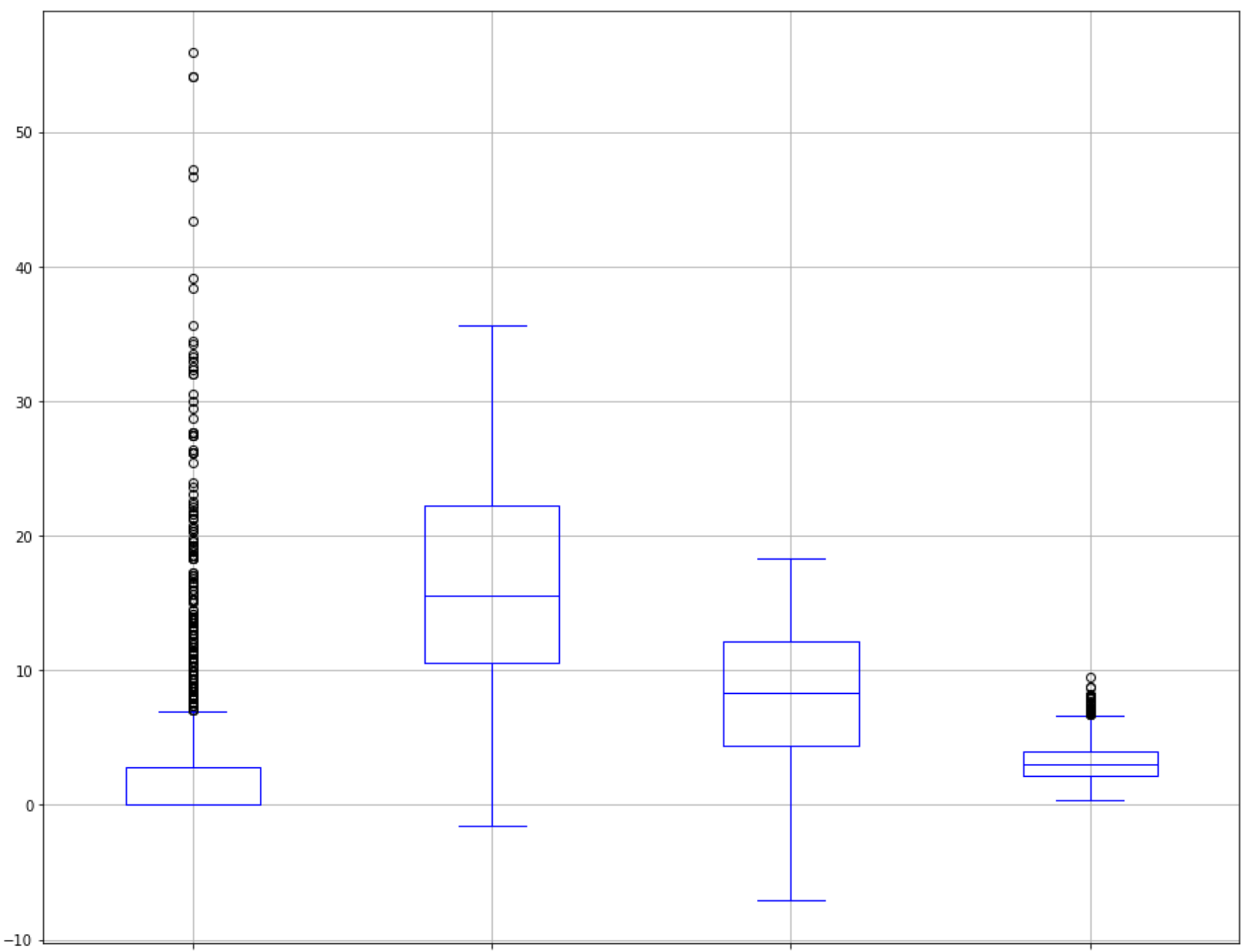

```
******************** ############### ********************
```

In [32]:
```
plt.figure(figsize=(10,5))
sns.countplot(x = 'weather',data = df)
plt.xlabel("Weather Condition",fontweight='bold',size=14)
plt.ylabel("Count",fontweight='bold',size=14)
plt.show()
```



In [34]:
```
# Checking for the presence of outliers in numeric cols
#Outlier is an observation that appears far away and diverges from an overall pattern in a sample. Outliers in input
plt.figure(figsize=(15,12))
df.boxplot(column=['precipitation','temp_max','temp_min','wind'],color='blue')
```

Out[34]: <AxesSubplot:>


50
40
30
20
10
0
−10
precipitation
temp_max
temp_min
wind

In [39]:
```
#Finding values of outliers(IQR method)
#Checking for the presence of outliers in numeric cols
#Outlier is an observation that appears far away and diverges from an overall pattern in a sample. Outliers in input
def detect_outliers_iqr(data):
    outlier_list = []
    data = sorted(data)
    q1 = np.percentile(data, 25)
    q3 = np.percentile(data, 75)
    #print("The Val of Q1 and Q2:",q1, q3)
    IQR = q3-q1
    print("IQR:",IQR)
    lwr_bound = q1-(1.5*IQR)
    upr_bound = q3+(1.5*IQR)
    print("The lower & Upper Bound:",lwr_bound, upr_bound)
    for i in data:
        if (i<lwr_bound or i>upr_bound):
            outlier_list.append(i)
    return outlier_list # Driver code
for i in ['precipitation','temp_max','temp_min','wind']:
    outliers = detect_outliers_iqr(df[i])
    print("Outliers in",i,"attribute :", outliers)
    print("-"*100)
    df.shape
```

```
IQR: 2.8
The lower & Upper Bound: -4.199999999999999 6.999999999999999
Outliers in precipitation attribute : [7.1, 7.1, 7.1, 7.4, 7.4, 7.4, 7.4, 7.6, 7.6, 7.6, 7.9, 7.9, 7.9, 7.9, 7.9,
7.9, 8.1, 8.1, 8.1, 8.1, 8.1, 8.1, 8.1, 8.1, 8.1, 8.1, 8.4, 8.4, 8.4, 8.4, 8.6, 8.6, 8.6, 8.6, 8.6, 8.6, 8.9, 8.9,
8.9, 8.9, 8.9, 9.1, 9.1, 9.4, 9.4, 9.4, 9.4, 9.4, 9.4, 9.4, 9.4, 9.4, 9.7, 9.7, 9.7, 9.7, 9.7, 9.9, 9.9, 9.9, 9.9,
9.9, 10.2, 10.2, 10.4, 10.7, 10.7, 10.7, 10.9, 10.9, 10.9, 10.9, 10.9, 10.9, 11.2, 11.2, 11.4, 11.4, 11.7, 11.7, 1
1.7, 11.9, 11.9, 12.2, 12.2, 12.4, 12.7, 12.7, 12.7, 12.7, 12.7, 12.7, 13.0, 13.0, 13.0, 13.0, 13.2, 13.2, 13.5, 1
3.5, 13.5, 13.5, 13.5, 13.7, 13.7, 13.7, 13.7, 13.7, 13.7, 14.0, 14.0, 14.0, 14.2, 14.2, 14.5, 14.5, 15.0, 15.2, 1
5.2, 15.2, 15.2, 15.2, 15.7, 15.7, 16.0, 16.0, 16.0, 16.3, 16.5, 16.5, 16.5, 16.8, 17.0, 17.0, 17.0, 17.3, 17.3, 1
8.3, 18.3, 18.3, 18.3, 18.5, 18.5, 18.5, 18.5, 18.5, 18.8, 19.1, 19.3, 19.3, 19.3, 19.3, 19.6, 19.6, 19.8, 20.3, 2
0.3, 20.6, 20.6, 20.8, 21.3, 21.3, 21.3, 21.6, 21.6, 21.8, 22.1, 22.4, 22.6, 23.1, 23.6, 23.9, 25.4, 26.2, 26.2, 2
6.2, 26.2, 26.4, 27.4, 27.4, 27.4, 27.7, 27.7, 27.7, 28.7, 29.5, 30.0, 30.5, 32.0, 32.0, 32.3, 32.5, 33.0, 33.3, 3
3.5, 34.3, 34.5, 35.6, 38.4, 39.1, 43.4, 46.7, 47.2, 54.1, 54.1, 55.9]
----------------------------------------------------------------------------------------------------
IQR: 11.6
The lower & Upper Bound: -6.799999999999999 39.599999999999994
```

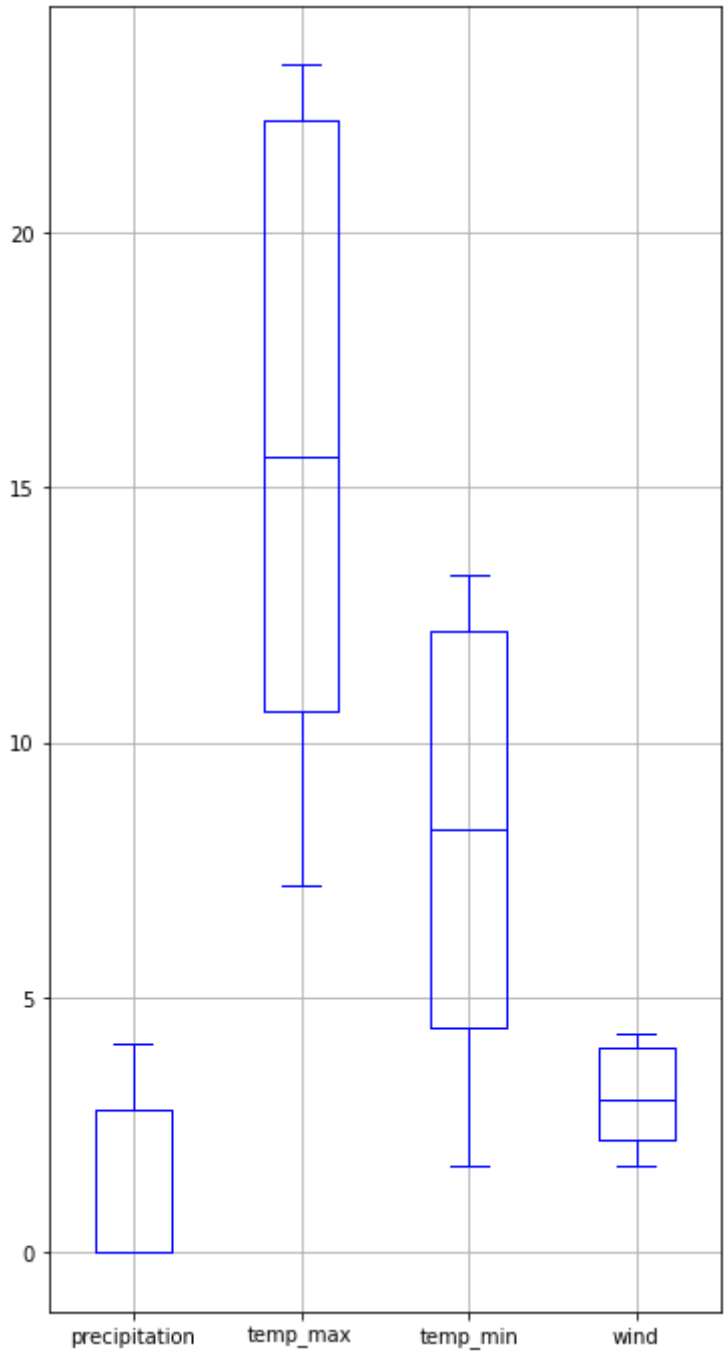
```
Outliers in temp_max attribute : []
-----------------------------------------------------------------------------------------------
IQR: 7.799999999999999
The lower & Upper Bound: -7.299999999999999 23.9
Outliers in temp_min attribute : []
-----------------------------------------------------------------------------------------------
IQR: 1.7999999999999998
The lower & Upper Bound: -0.49999999999999956 6.699999999999999
Outliers in wind attribute : [6.7, 6.7, 6.7, 6.7, 6.8, 6.8, 6.9, 7.0, 7.0, 7.0, 7.1, 7.1, 7.1, 7.2, 7.2, 7.3, 7.3,
7.5, 7.5, 7.6, 7.6, 7.6, 7.7, 7.9, 7.9, 8.0, 8.0, 8.1, 8.1, 8.1, 8.2, 8.8, 8.8, 9.5]
-----------------------------------------------------------------------------------------------
```

In [57]:

```
def handle_outliers(df):
    tenth_percentile = np.percentile(df, 10)
    ninetieth_percentile = np.percentile(df, 80)
    b = np.where(df<tenth_percentile, tenth_percentile, df)
    b1 = np.where(b>ninetieth_percentile, ninetieth_percentile, b)
    return b1
for i in ['precipitation','temp_max','temp_min','wind']:
    df[i]=handle_outliers(df[i])
```

In [45]:
```
plt.figure(figsize=(6,12))
color = np.arange(0,1461)
df.boxplot(column=['precipitation','temp_max','temp_min','wind'],color='blue')
```

Out[45]: <AxesSubplot:>


20
15
10
5
0
precipitation
temp_max
temp_min
wind

In [31]:
```
classes={

        'drizzle':0,
        'fog':1,
        'rain':2,
        'snow':3,
        'sun':4
}
```

In [32]:
```
dataset=df.drop('date', axis=1)
```

In [33]:
```
#astype('category'):the data type is simply changed to category and there is no pre-defined order of values in the li
#.cat.code: extracts the numeric representation of the levels of a factor
dataset['weather']=dataset['weather'].astype('category')
dataset['weather']=dataset['weather'].cat.codes
```

In [34]:
```
x = dataset.drop('weather',axis=1)
y = dataset['weather']
```

In [35]:
```
x
```

Out[35]:

	precipitation	temp_max	temp_min	wind
0	0.0	12.8	5.0	4.7
1	10.9	10.6	2.8	4.5
2	0.8	11.7	7.2	2.3
3	20.3	12.2	5.6	4.7
4	1.3	8.9	2.8	6.1
...	...	...	...	...
1456	8.6	4.4	1.7	2.9
1457	1.5	5.0	1.7	1.3
1458	0.0	7.2	0.6	2.6
1459	0.0	5.6	-1.0	3.4
1460	0.0	5.6	-2.1	3.5

1461 rows × 4 columns

In [36]:
```
y
```

Out[36]:
```
0       0
1       2
2       2
3       2
4       2
       ..
1456    2
1457    2
1458    1
1459    4
1460    4
Name: weather, Length: 1461, dtype: int8
```

In [37]:
```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test = train_test_split(x, y, test_size = 0.25, random_state =42)
```

In [38]:
```
x_train.dtypes
```

Out[38]:
```
precipitation    float64
temp_max         float64
temp_min         float64
wind             float64
dtype: object
```

In [39]:
```
y_train.dtypes
```

Out[39]:
```
dtype('int8')
```

In [40]:
```
print("-"*40)
print("Shape of x training data : ",x_train.shape)
print("Shape of y training data : ",y_train.shape)
print("-"*40)
print("Shape of x testing data : ",x_test.shape)
print("Shape of y testing data : ",y_test.shape)
print("-"*40)
```

```
----------------------------------------
Shape of x training data :  (1095, 4)
Shape of y training data :  (1095,)
----------------------------------------
Shape of x testing data :  (366, 4)
Shape of y testing data :  (366,)
----------------------------------------
```

In [41]:
```
sc = StandardScaler()#Standardize features by removing the mean and scaling to unit variance.
x_train = sc.fit_transform(x_train)#combination of fit() and transform() api on same data set
x_test = sc.transform(x_test)#parameters generated from fit() method, applied upon model to generate transformed data
```

In [ ]:
```
Dealing this problem with Seven machine learning models.(Classification)

1.LogisticRegression

2.KNeighbors

3.SVC(Support Vector Classification)

4.Gaussian Naive Bayes (GaussianNB)

5.RandomForest

6.SGD(stochastic gradient descent)

7.Gradient Boosting
```

In [42]:
```
# model
from sklearn.linear_model import LogisticRegression
classifier_log=LogisticRegression(random_state=0)
classifier_log.fit(x_train,y_train)
```

Out[42]:
```
LogisticRegression(random_state=0)
```

In [43]:
```
#model
from sklearn.neighbors import KNeighborsClassifier
classifier_knn=KNeighborsClassifier(n_neighbors = 5)#n_neighbors:int,default=5 Number of neighbors to search for duri
classifier_knn.fit(x_train,y_train)
```

Out[43]:
```
KNeighborsClassifier()
```

In [44]:
```
# model
from sklearn.svm import SVC
classifier_svc=SVC(kernel = 'linear', random_state=42)#The linear regression model expects a continuous valued target
classifier_svc.fit(x_train, y_train)
```

Out[44]:
```
SVC(kernel='linear', random_state=42)
```

In [45]:
```
# model
from sklearn.naive_bayes import GaussianNB
classifier_gnb=GaussianNB()
classifier_gnb.fit(x_train, y_train,sample_weight=None)
```

Out[45]:
```
GaussianNB()
```

In [46]:
```
# model
from sklearn.ensemble import RandomForestClassifier
classifier_rfc=RandomForestClassifier(n_estimators=10, criterion='entropy', random_state=0)
classifier_rfc.fit(x_train, y_train,sample_weight=None)
```

Out[46]:
```
RandomForestClassifier(criterion='entropy', n_estimators=10, random_state=0)
```

In [47]:
```
# model
from sklearn.linear_model import SGDClassifier
classifier_sgdc=SGDClassifier()#stochastic gradient descent (SGD):the gradient of the loss is estimated each sample c
classifier_sgdc.fit(x_train, y_train)
```

Out[47]:
```
SGDClassifier()
```

In [48]:
```
# model
from sklearn.ensemble import GradientBoostingClassifier
classifier_gbc=GradientBoostingClassifier()
classifier_gbc.fit(x_train,y_train)
```

Out[48]:
```
GradientBoostingClassifier()
```

In [49]:
```
classifier_list=[classifier_log,classifier_knn,classifier_svc,classifier_gnb,classifier_rfc,classifier_sgdc,classifie
```

In [50]:
```
#After training the model, it is time to use it to do predictions on testing data.
#Metrics are used to check the model performance on predicted values and actual values.
def accuracy(x_test, y_test, classifier):
    print(f"\nclassifier\n{classifier}")
    y_pred=classifier.predict(x_test)
    correct=0
    total=len(y_pred)
    for i,j in zip(y_pred,y_test):
        if i==j:
            correct+=1
    acc=(correct/total)*100
    print("\n"+str(acc)+"\n"+"-"*30+"\n")
    print("\n"+"*"*50+"\n"+classification_report(y_test,y_pred)+"\n")
    cm=confusion_matrix(y_test,y_pred)
    print(f"Confusion Matrix\n{cm}\n")
    return acc
```

In [51]:
```
accuracy_list=[]
classifier_list_str=[]
```

In [52]:
```
for clf in classifier_list:
    acc=accuracy(x_test, y_test, clf)
    accuracy_list.append(acc)
    classifier_list_str.append(str(clf)[:6])
```

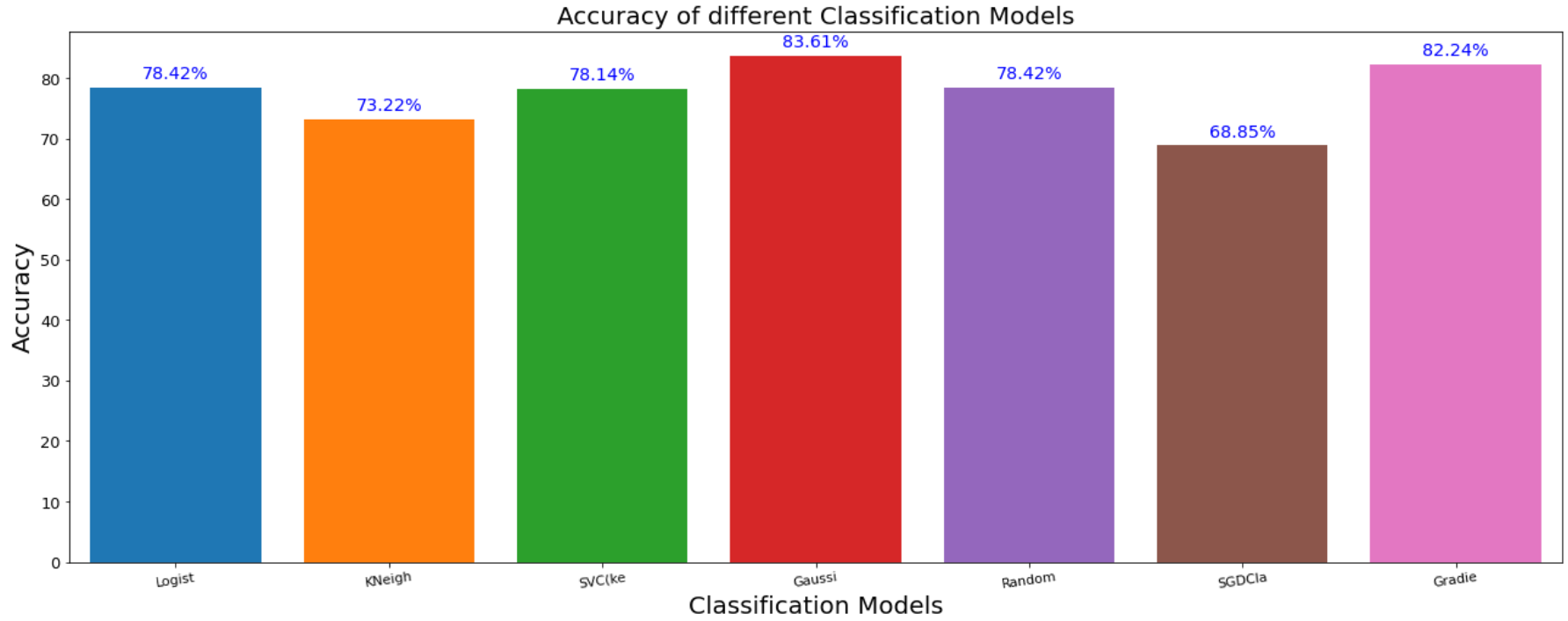
```
classifier
LogisticRegression(random_state=0)

78.41530054644808
------------------------------


**************************************************
              precision    recall  f1-score   support

           0       0.00      0.00      0.00        11
           1       0.00      0.00      0.00        30
           2       0.89      0.84      0.87       161
           3       1.00      0.12      0.22         8
           4       0.70      0.96      0.81       156

    accuracy                           0.78       366
   macro avg       0.52      0.39      0.38       366
```

In [53]:
```
classifier_list_str
```

Out[53]:
```
['Logist', 'KNeigh', 'SVC(ke', 'Gaussi', 'Random', 'SGDCla', 'Gradie']
```

In [54]:

```
plt.figure(figsize=(22,8))
ax = sns.barplot(x=classifier_list_str, y=accuracy_list, saturation =1.5)
plt.xlabel("Classification Models", fontsize = 20)
plt.ylabel("Accuracy", fontsize = 20)
plt.title("Accuracy of different Classification Models", fontsize = 20)
plt.xticks(fontsize = 11, horizontalalignment = 'center', rotation = 8)
plt.yticks(fontsize = 13)
for p in ax.patches:
    width, height = p.get_width(), p.get_height()
    x, y = p.get_xy()
    ax.annotate(f'{height/100:.2%}',(x + width/2, y + height*1.02),ha='center', fontsize ='x-large',color='blue')
plt.show()
```



In [ ]:
```
We have predicted the Weather using Seven different ML model algorithms.
The percentage of:-
1.LogisticRegression= 78.42%

2.KNeighbors= 73.22%

3.SVC(Support Vector Classification)= 78.14%

4.Gaussian Naive Bayes (GaussianNB)= 83.16%

5.RandomForest= 78.42%

6.SGD(stochastic gradient descent)= 68.85%

7.Gradient Boosting= 82.24%
```

In [56]:
```
Conclusion:-
    Out of seven machine learning algorithms we applied,
    We conclude that Gaussian NB classifier performs the best on this dataset with 83.61% Accuracy
```