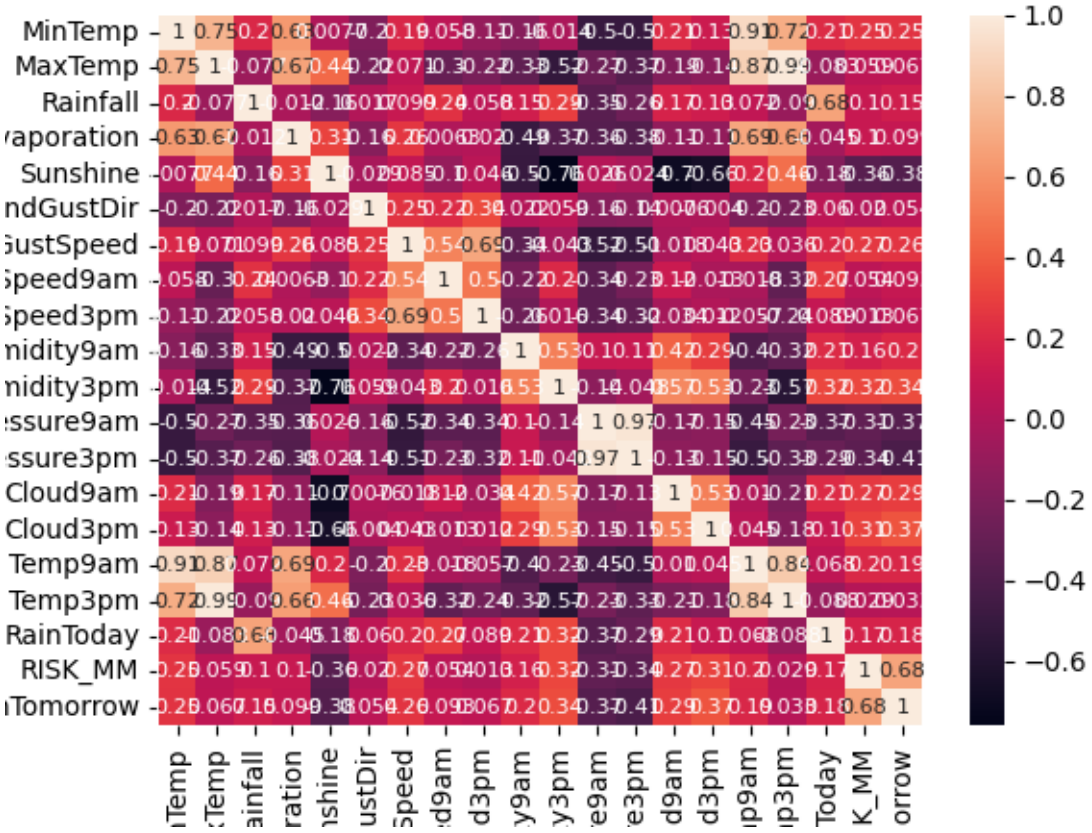
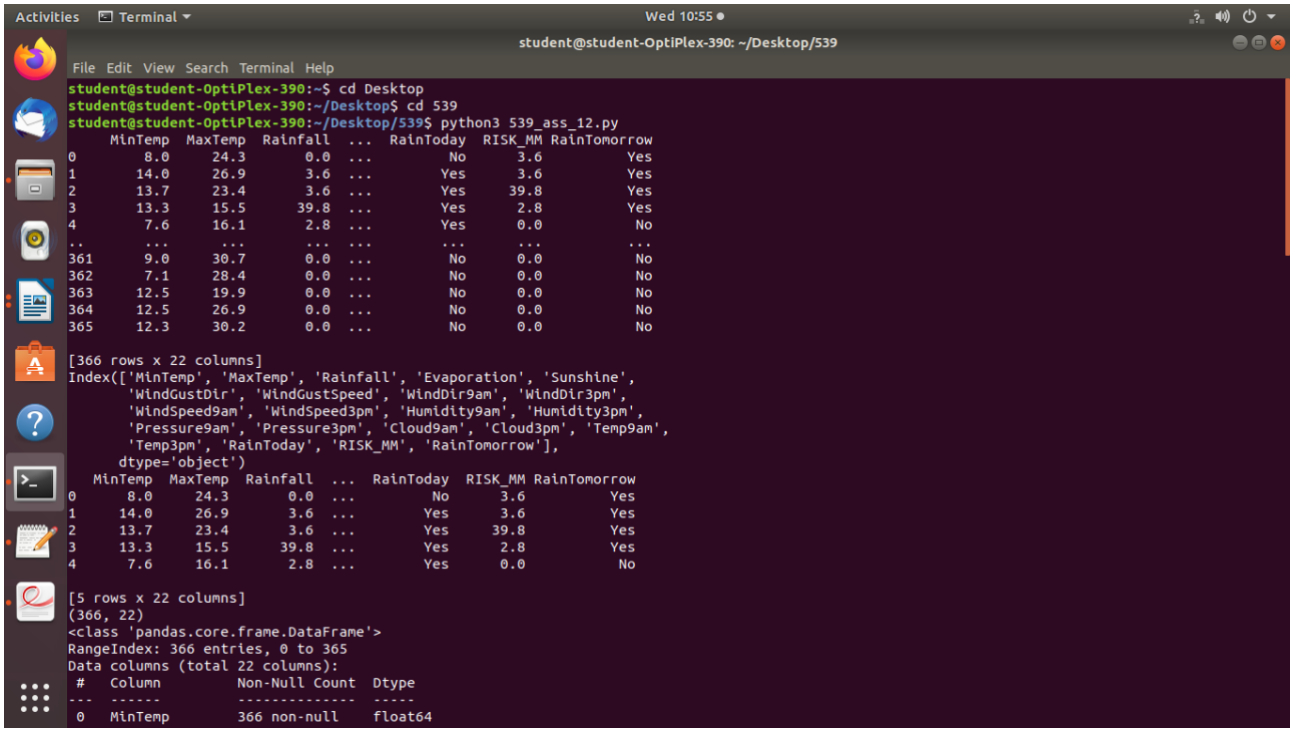
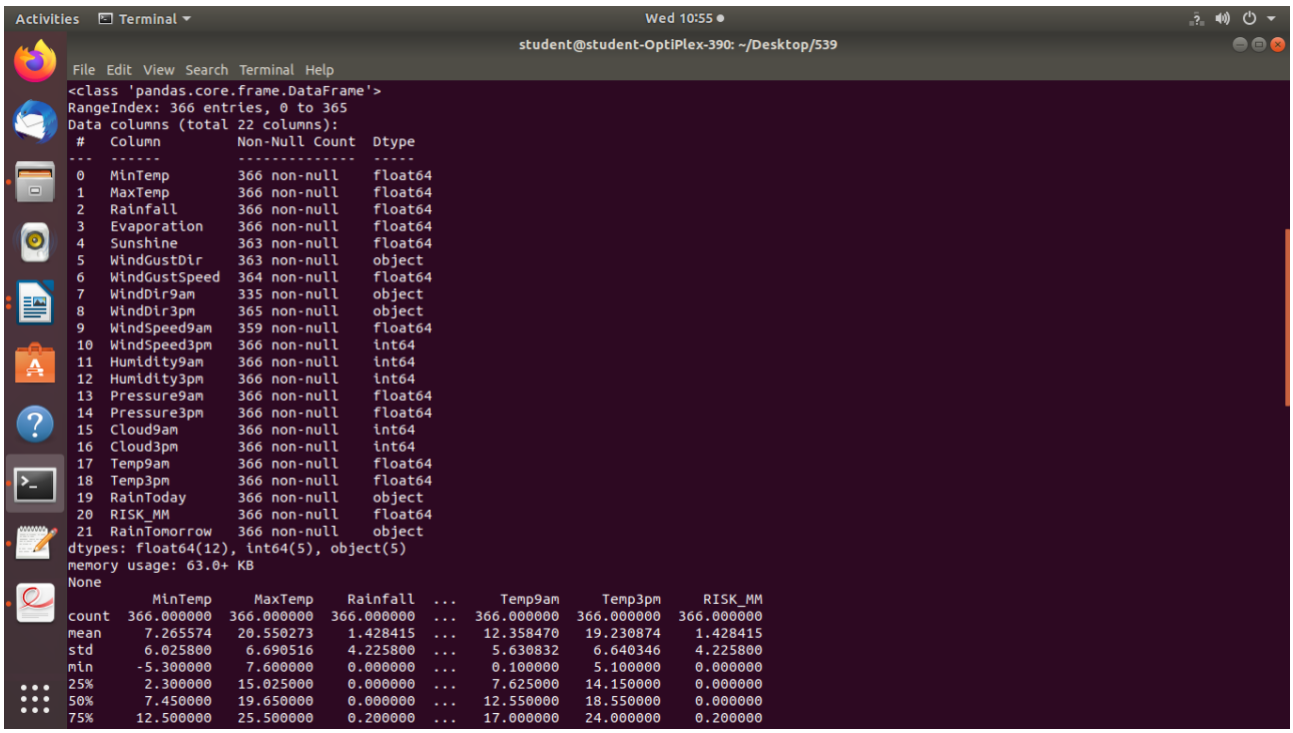
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sn
df=pd.read_csv("weather.csv")
print(df)
print(df.columns)
print(df.head())
print(df.shape)
print(df.info())
print(df.describe())
print(df.isnull().sum())
df=df.dropna()
print(df.isnull().sum())
df['RainTomorrow'].unique()
Y=df.RainTomorrow
print(Y.head())
from sklearn import preprocessing
label_encoder=preprocessing.LabelEncoder()
df['RainTomorrow']=label_encoder.fit_transform(df['RainTomorrow'])
print(df['RainTomorrow'].unique())
label_encoder=preprocessing.LabelEncoder()
df['WindGustDir']=label_encoder.fit_transform(df['WindGustDir'])
print(df['WindGustDir'].unique())
label_encoder=preprocessing.LabelEncoder()
df['RainToday']=label_encoder.fit_transform(df['RainToday'])
print(df['RainToday'].unique())
hm=sn.heatmap(data=df.corr(),annot=True,annot_kws={'size':8})
sn.set(rc={'figure.figsize':(12,12)})
plt.show()
X=df.drop(['RainTomorrow','WindDir9am','WindDir3pm','WindSpeed9am'],axis='columns')
print(X.head())
from sklearn.model_selection import train_test_split
X_train,X_test,Y_train,Y_test=train_test_split(X,Y,test_size=0.2,random_state=10)
from sklearn import svm
clf=svm.SVC(kernel='linear')
clf.fit(X_train,Y_train)
y_pred=clf.predict(X_test)
from sklearn import metrics
print("Accuracy:",metrics.accuracy_score(Y_test,y_pred))
model=svm.SVC(kernel='poly')
model.fit(X_train,Y_train)
y_pred=model.predict(X_test)
from sklearn import metrics
print("Accuracy:",metrics.accuracy_score(Y_test,y_pred))
```

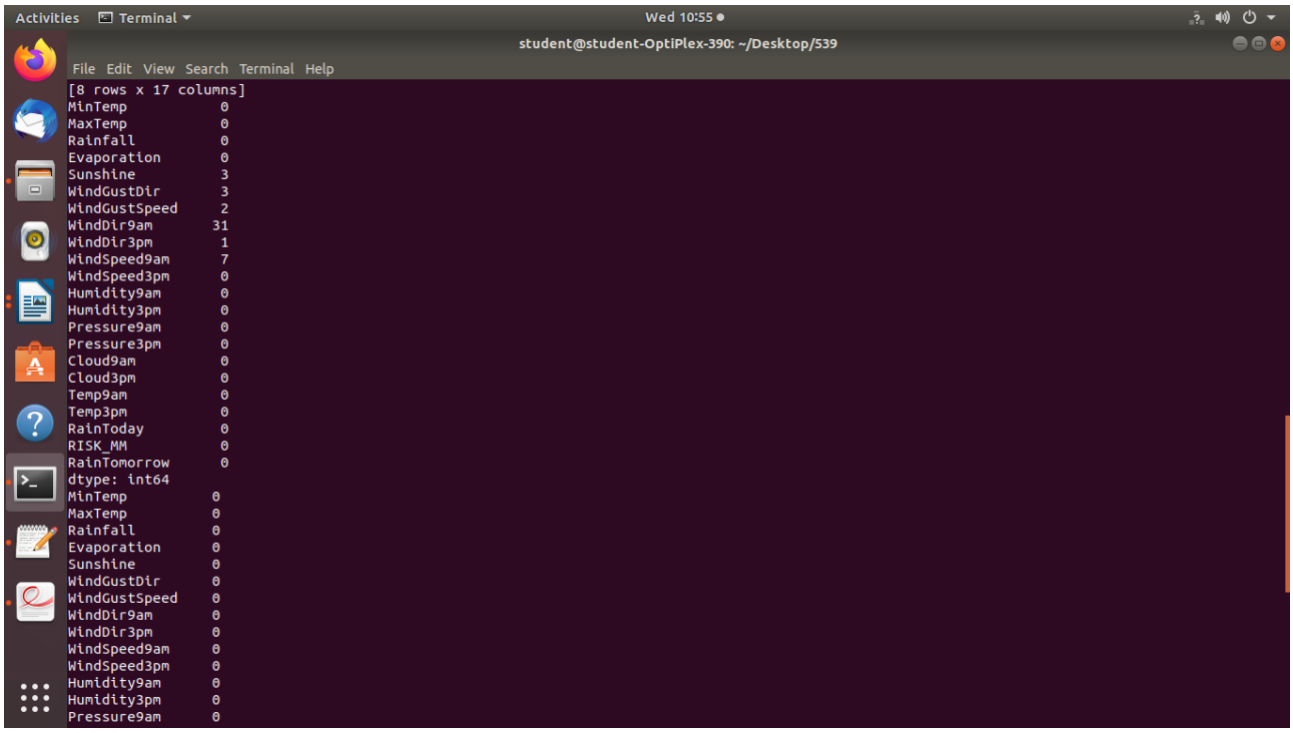
output


MinTemp
MaxTemp
Rainfall
Sunshine
Speed9am
Speed3pm
Cloud9am
Cloud3pm
Temp9am
Temp3pm
RainToday
RISK_MM
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6

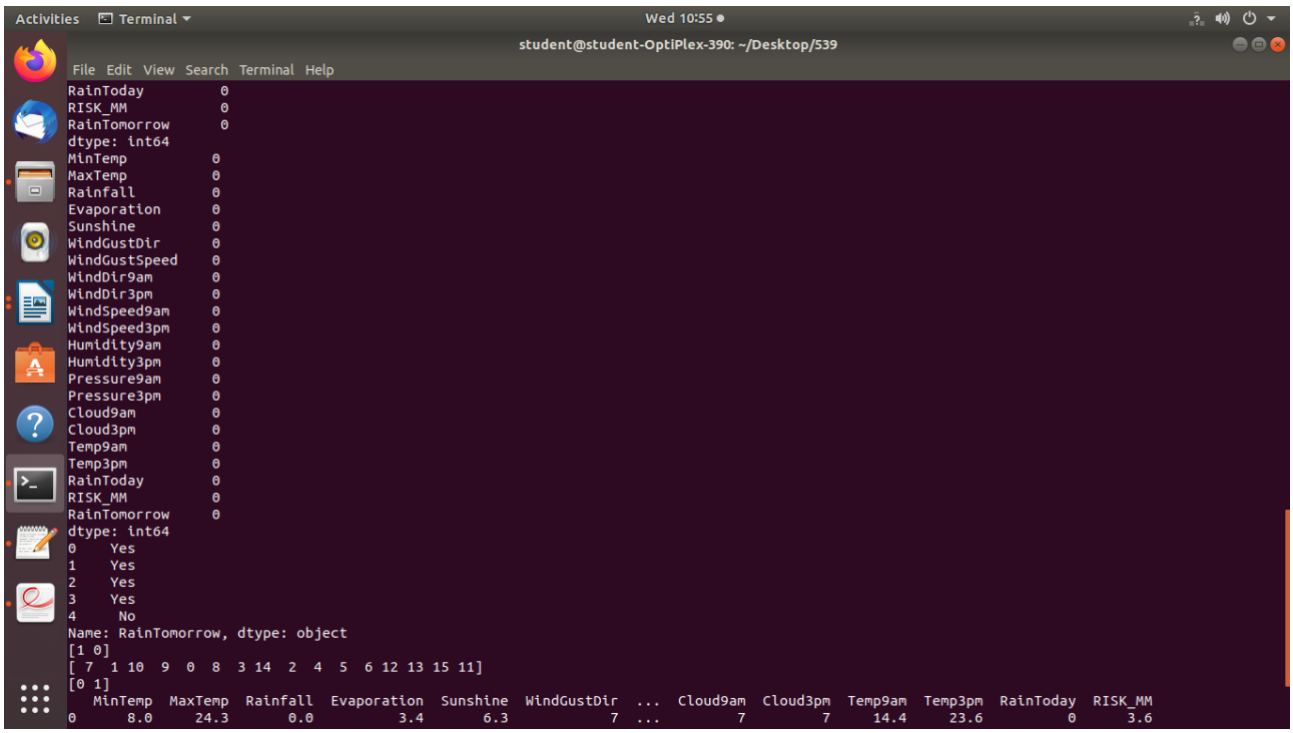

Activities
Terminal
Wed 10:55
student@student-OptiPlex-390: ~/Desktop/539
File Edit View Search Terminal Help
student@student-OptiPlex-390:~$ cd Desktop
student@student-OptiPlex-390:~/Desktop$ cd 539
student@student-OptiPlex-390:~/Desktop/539$ python3 539_ass_12.py
MinTemp MaxTemp Rainfall ... RainToday RISK_MM RainTomorrow
0 8.0 24.3 0.0 ... No 3.6 Yes
1 14.0 26.9 3.6 ... Yes 3.6 Yes
2 13.7 23.4 3.6 ... Yes 39.8 Yes
3 13.3 15.5 39.8 ... Yes 2.8 Yes
4 7.6 16.1 2.8 ... Yes 0.0 No
361 9.0 30.7 0.0 ... No 0.0 No
362 7.1 28.4 0.0 ... No 0.0 No
363 12.5 19.9 0.0 ... No 0.0 No
364 12.5 26.9 0.0 ... No 0.0 No
365 12.3 30.2 0.0 ... No 0.0 No
[366 rows x 22 columns]
Index(['MinTemp', 'MaxTemp', 'Rainfall', 'Evaporation', 'Sunshine',
'WindGustDir', 'WindGustSpeed', 'WindDir9am', 'WindDir3pm',
'WindSpeed9am', 'WindSpeed3pm', 'Humidity9am', 'Humidity3pm',
'Pressure9am', 'Pressure3pm', 'Cloud9am', 'Cloud3pm', 'Temp9am',
'Temp3pm', 'RainToday', 'RISK_MM', 'RainTomorrow'],
dtype='object')
MinTemp MaxTemp Rainfall ... RainToday RISK_MM RainTomorrow
0 8.0 24.3 0.0 ... No 3.6 Yes
1 14.0 26.9 3.6 ... Yes 3.6 Yes
2 13.7 23.4 3.6 ... Yes 39.8 Yes
3 13.3 15.5 39.8 ... Yes 2.8 Yes
4 7.6 16.1 2.8 ... Yes 0.0 No
[5 rows x 22 columns]
(366, 22)
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 366 entries, 0 to 365
Data columns (total 22 columns):
Column Non-Null Count Dtype
--- ------ -------------- -----
0 MinTemp 366 non-null float64

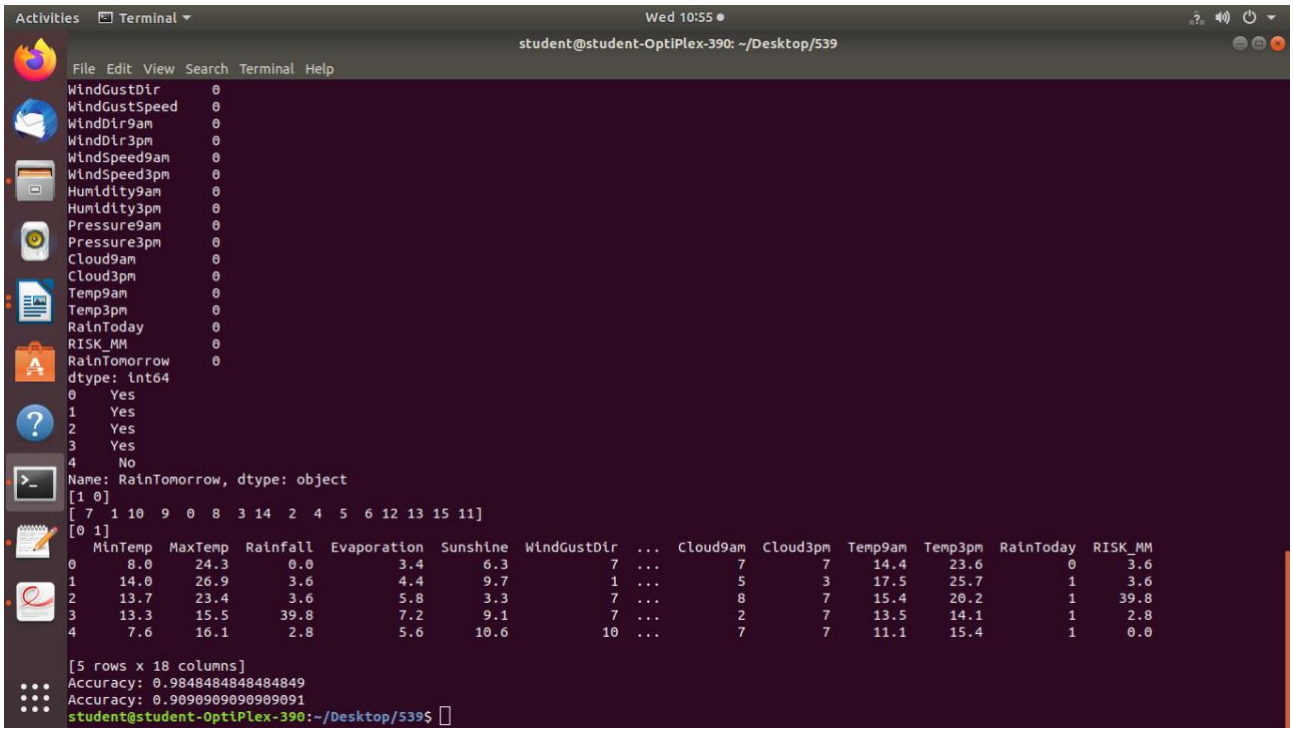



```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 366 entries, 0 to 365
Data columns (total 22 columns):
 #   Column         Non-Null Count  Dtype
---  ------         --------------  -----
 0   MinTemp        366 non-null    float64
 1   MaxTemp        366 non-null    float64
 2   Rainfall       366 non-null    float64
 3   Evaporation    366 non-null    float64
 4   Sunshine       363 non-null    float64
 5   WindGustDir    363 non-null    object
 6   WindGustSpeed  364 non-null    float64
 7   WindDir9am     335 non-null    object
 8   WindDir3pm     365 non-null    object
 9   WindSpeed9am   359 non-null    float64
 10  WindSpeed3pm   366 non-null    int64
 11  Humidity9am    366 non-null    int64
 12  Humidity3pm    366 non-null    int64
 13  Pressure9am    366 non-null    float64
 14  Pressure3pm    366 non-null    float64
 15  Cloud9am       366 non-null    int64
 16  Cloud3pm       366 non-null    int64
 17  Temp9am        366 non-null    float64
 18  Temp3pm        366 non-null    float64
 19  RainToday      366 non-null    object
 20  RISK_MM        366 non-null    float64
 21  RainTomorrow   366 non-null    object
dtypes: float64(12), int64(5), object(5)
memory usage: 63.0+ KB
None
          MinTemp     MaxTemp    Rainfall  ...     Temp9am     Temp3pm     RISK_MM
count  366.000000  366.000000  366.000000  ...  366.000000  366.000000  366.000000
mean     7.265574   20.550273    1.428415  ...   12.358470   19.230874    1.428415
std      6.025800    6.690516    4.225800  ...    5.630832    6.640346    4.225800
min     -5.300000    7.600000    0.000000  ...    0.100000    5.100000    0.000000
25%      2.300000   15.025000    0.000000  ...    7.625000   14.150000    0.000000
50%      7.450000   19.650000    0.000000  ...   12.550000   18.550000    0.000000
75%     12.500000   25.500000    0.200000  ...   17.000000   24.000000    0.200000
```




```
[8 rows x 17 columns]
MinTemp          0
MaxTemp          0
Rainfall         0
Evaporation      0
Sunshine         3
WindGustDir      3
WindGustSpeed    2
WindDir9am      31
WindDir3pm       1
WindSpeed9am     7
WindSpeed3pm     0
Humidity9am      0
Humidity3pm      0
Pressure9am      0
Pressure3pm      0
Cloud9am         0
Cloud3pm         0
Temp9am          0
Temp3pm          0
RainToday        0
RISK_MM          0
RainTomorrow     0
dtype: int64
MinTemp          0
MaxTemp          0
Rainfall         0
Evaporation      0
Sunshine         0
WindGustDir      0
WindGustSpeed    0
WindDir9am       0
WindDir3pm       0
WindSpeed9am     0
WindSpeed3pm     0
Humidity9am      0
Humidity3pm      0
Pressure9am      0
```


Activities
Terminal
Wed 10:55
student@student-OptiPlex-390: ~/Desktop/539
File Edit View Search Terminal Help
RainToday 0
RISK_MM 0
RainTomorrow 0
dtype: int64
MinTemp 0
MaxTemp 0
Rainfall 0
Evaporation 0
Sunshine 0
WindGustDir 0
WindGustSpeed 0
WindDir9am 0
WindDir3pm 0
WindSpeed9am 0
WindSpeed3pm 0
Humidity9am 0
Humidity3pm 0
Pressure9am 0
Pressure3pm 0
Cloud9am 0
Cloud3pm 0
Temp9am 0
Temp3pm 0
RainToday 0
RISK_MM 0
RainTomorrow 0
dtype: int64
0 Yes
1 Yes
2 Yes
3 Yes
4 No
Name: RainTomorrow, dtype: object
[1 0]
[7 1 10 9 0 8 3 14 2 4 5 6 12 13 15 11]
[0 1]
MinTemp MaxTemp Rainfall Evaporation Sunshine WindGustDir ... Cloud9am Cloud3pm Temp9am Temp3pm RainToday RISK_MM
0 8.0 24.3 0.0 3.4 6.3 7 ... 7 7 14.4 23.6 0 3.6


Activities
Terminal
Wed 10:55
student@student-OptiPlex-390: ~/Desktop/539
File Edit View Search Terminal Help
WindGustDir 0
WindGustSpeed 0
WindDir9am 0
WindDir3pm 0
WindSpeed9am 0
WindSpeed3pm 0
Humidity9am 0
Humidity3pm 0
Pressure9am 0
Pressure3pm 0
Cloud9am 0
Cloud3pm 0
Temp9am 0
Temp3pm 0
RainToday 0
RISK_MM 0
RainTomorrow 0
dtype: int64
0 Yes
1 Yes
2 Yes
3 Yes
4 No
Name: RainTomorrow, dtype: object
[1 0]
[7 1 10 9 0 8 3 14 2 4 5 6 12 13 15 11]
[0 1]
MinTemp MaxTemp Rainfall Evaporation Sunshine WindGustDir ... Cloud9am Cloud3pm Temp9am Temp3pm RainToday RISK_MM
0 8.0 24.3 0.0 3.4 6.3 7 ... 7 7 14.4 23.6 0 3.6
1 14.0 26.9 3.6 4.4 9.7 1 ... 5 3 17.5 25.7 1 3.6
2 13.7 23.4 3.6 5.8 3.3 7 ... 8 7 15.4 20.2 1 39.8
3 13.3 15.5 39.8 7.2 9.1 7 ... 2 7 13.5 14.1 1 2.8
4 7.6 16.1 2.8 5.6 10.6 10 ... 7 7 11.1 15.4 1 0.0
[5 rows x 18 columns]
Accuracy: 0.9848484848484849
Accuracy: 0.9090909090909091
student@student-OptiPlex-390:~/Desktop/539$