

# **EMERGING METHODS FOR EARLY DETECTION OF FOREST FIRES**

## **PROJECT DEVELOPMENT PHASE**

### **SPRINT 4**

Date	05.11.2022
Team ID	PNT2022TMID30386
Project Name	Emerging Methods For Early Detection Of Forest Fires
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```
In[4]: import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
import seaborn as sns
from sklearn import metrics
from sklearn.metrics import
classification_report, confusion_matrix
```

```
In[5]: import warnings
warnings.filterwarnings(action="ignore")
%matplotlib inline
sns.set_style('darkgrid')
pd.set_option("display.max_rows", 1000)
pd.set_option("display.max_columns", 1000)
```

```
In[6]: fires = pd.read_csv(r"C:\Users\dhine\Downloads\forestfires.csv\forestfires.csv")
#show the first 15 instances of the dataset
fires.head(15)
```

```
Out[6]:
```

	XY	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	area
0	75	mar	fri	86.2	26.2	94.3	5.1	8.2	51	6.7	0.0	0.0
1	7 4	oct	tue	90.6	35.4	669.1	6.7	18.0	33	0.9	0.0	0.0
2	74	oct	sat	90.6	43.7	686.9	6.7	14.6	33	1.3	0.0	0.0
3	8 6	mar	fri	91.7	33.3	77.5	9.0	8.3	97	4.0	0.2	0.0
4	86	mar	sun	89.3	51.3	102.2	9.6	11.4	99	1.8	0.0	0.0
5	8 6	aug	sun	92.3	85.3	488.0	14.7	22.2	29	5.4	0.0	0.0
6	86	aug	mon	92.3	88.9	495.6	8.5	24.1	27	3.1	0.0	0.0
7	8 6	aug	mon	91.5	145.4	608.2	10.7	8.0	86	2.2	0.0	0.0
8	86	sep	tue	91.0	129.5	692.6	7.0	13.1	63	5.4	0.0	0.0
9	7 5	sep	sat	92.5	88.0	698.6	7.1	22.8	40	4.0	0.0	0.0
10	7 5	sep	sat	92.5	88.0	698.6	7.1	17.8	51	7.2	0.0	0.0
11	7 5	sep	sat	92.8	73.2	713.0	22.6	19.3	38	4.0	0.0	0.0
12	6 5	aug	fri	63.5	70.8	665.3	0.8	17.0	72	6.7	0.0	0.0
13	6 5	sep	mon	90.9	126.5	686.5	7.0	21.3	42	2.2	0.0	0.0
14	6 5	sep	wed	92.9	133.3	699.6	9.2	26.4	21	4.5	0.0	0.0

```
In[7]: fires.shape
```

(517,13)

Out[7]:

```
In[8]: #show the last 10 instances of dataset fires.tail(10)
```

Out[8]:

	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	area
502	4	4	aug	tue	96.1	181.1	671.2	14.3	20.7	69	4.9	0.4	0.00
503	2	4	aug	wed	94.5	139.4	689.1	20.0	29.2	30	4.9	0.0	1.95
504	4	3	aug	wed	94.5	139.4	689.1	20.0	28.9	29	4.9	0.0	49.59
505	1	2	aug	thu	91.0	163.2	744.4	10.1	26.7	35	1.8	0.0	5.80
506	1	2	aug	fri	91.0	166.9	752.6	7.1	18.5	73	8.5	0.0	0.00
507	2	4	aug	fri	91.0	166.9	752.6	7.1	25.9	41	3.6	0.0	0.00
508	1	2	aug	fri	91.0	166.9	752.6	7.1	25.9	41	3.6	0.0	0.00
509	5	4	aug	fri	91.0	166.9	752.6	7.1	21.1	71	7.6	1.4	2.17
510	6	5	aug	fri	91.0	166.9	752.6	7.1	18.2	62	5.4	0.0	0.43
511	8	6	aug	sun	81.6	56.7	665.6	1.9	27.8	35	2.7	0.0	0.00
512	4	3	aug	sun	81.6	56.7	665.6	1.9	27.8	32	2.7	0.0	6.44
513	2	4	aug	sun	81.6	56.7	665.6	1.9	21.9	71	5.8	0.0	54.29
514	7	4	aug	sun	81.6	56.7	665.6	1.9	21.2	70	6.7	0.0	11.16
515	1	4	aug	sat	94.4	146.0	614.7	11.3	25.6	42	4.0	0.0	0.00
5166	3		nov	tue	79.5	3.0	106.7	1.1	11.8	31	4.5	0.0	0.00

```
In[9]: fires.info()
```

```
<class 'pandas.core.frame.DataFrame'>
```

```
RangeIndex: 517 entries, 0 to 516
```

```
Data columns (total 13 columns):
```

```
# ColumnNon-Null Count Dtype
```

```
-----
```

```
0    X 517non-null int64
1    Y  517non-null int64
2  month 517non-null object
3    day 517non-null object
4  FFMC 517non-null float64 DMC 517non-null float64
6    DC 517non-null float64
7    ISI 517non-null float64
8    temp 517non-null float64
9    RH 517non-null int64
10   wind 517non-null float64
```

11 rain517non-nullfloat64  
12 area517non-nullfloat64dtypes:float64(8),int64(3),object(2)memoryusage:52.6+ KB

```
In[10]: #generatedescriptivestatisticsofeachattributefires.describe().T
Out[10]:
count
```

X	517.0	4.669246	2.313778	1.0	3.0	4.00	7.00	9.00
Y	517.0	4.299807	1.229900	2.0	4.0	4.00	5.00	9.00
FFMC	517.0	90.644681	5.520111	118.7	90.2	91.60	92.90	96.20
DMC	517.0	110.872340	64.046482	1.1	68.6	108.30	142.40	291.30
DC	517.0	547.940039	248.066192	7.9	437.7	664.20	713.90	860.60

```
fires['area'].values[fires['area'].values>0]=1
#renamingtheareaattribute tooutputforlearunderstanding
fires=fires.rename(columns={'area':'output'})fires.head(10)
```

ISI	517.0	9.021663	4.559477	0.0	6.5	8.40	10.80	56.10
temp	517.0	18.889168	5.806625	2.2	15.5	19.30	22.80	33.30
RH	517.0	44.288201	16.317469	15.0	33.0	42.00	53.00	100.00
wind	517.0	4.017602	1.791653	0.4	2.7	4.00	4.90	9.40
rain	517.0	0.021663	0.295959	0.0	0.0	0.00	0.00	6.40
area	517.0	12.847292	63.655818	0.0	0.0	0.52	6.57	1090.84

In[11]:

```
Out[11]:
XYmonth      dayFFMCDMC      DC      ISItempRHwindrainoutput
```

```

0 7          5   mar      86.2  26.2  94.3  5.1   8.2  51   6.7  0.0   0.0
1 7          4   frioctue  90.6  35.4 669.1  6.7  18.0  33   0.9  0.0   0.0
2 7          4   octsat   90.6  43.7 686.9  6.7  14.6  33   1.3  0.0   0.0
3 7          6   marfrimar 91.7  33.3  77.5  9.0   8.3  97   4.0  0.2   0.0
4 8          6   sun      89.3  51.3 102.2  9.6  11.4  99   1.8  0.0   0.0
5 8          6   augsun   92.3  85.3 488.0 14.7  22.2  29   5.4  0.0   0.0
6 8          6   aug mon   92.3  88.9 495.6  8.5  24.1  27   3.1  0.0   0.0
7 8          6   aug monsep
8 8          6   tue
9 7          6   sepsat   91.5 145.4 608.2 10.7  8.0  86   2.2  0.0   0.0
10 8          6          91.0 129.5 692.6  7.0  13.1  63   5.4  0.0   0.0
11 8          5          92.5  88.0 698.6  7.1  22.8  40   4.0  0.0   0.0

```

```
In[12]: fires.corr()
```

```

Out[12]:
      X          Y      FPMC      DMC      DC      ISI      temp      RH      wind
X      1.000000  0.539548 -0.021039 -0.048384 -0.085916  0.006210 -0.051258  0.085223  0.018798  0.065
Y      0.539548  1.000000 -0.046308  0.007782 -0.101178 -0.024488 -0.024103  0.062221 -0.020341  0.033
FFMC -0.021039 -0.046308  1.000000  0.382619  0.330512  0.531805  0.431532 -0.300995 -0.028485  0.056
DMC -0.048384  0.007782  0.382619  1.000000  0.682192  0.305128  0.469594  0.073795 -0.105342  0.074
DC -0.085916 -0.101178  0.330512  0.682192  1.000000  0.229154  0.496208 -0.039192 -0.203466  0.035
ISI  0.006210 -0.024488  0.531805  0.305128  0.229154  1.000000  0.394287 -0.132517  0.106826  0.067
temp -0.051258 -0.024103  0.431532  0.469594  0.496208  0.394287  1.000000 -0.527390 -0.227116  0.069
RH  0.085223  0.062221 -0.300995  0.073795 -0.039192 -0.132517 -0.527390  1.000000  0.069410  0.099
wind 0.018798 -0.020341 -0.028485 -0.105342 -0.203466  0.106826 -0.227116  0.069410  1.000000  0.061
rain 0.065387  0.033234  0.056702  0.074790  0.035861  0.067668  0.069491  0.099751  0.061119  1.000
output 0.062491  0.056892  0.073823  0.062672  0.096724  0.035663  0.076047-0.035587  0.0557020.025

```

```

In[15]: numerical_feature=fires.describe(include=["int","float"]).columns

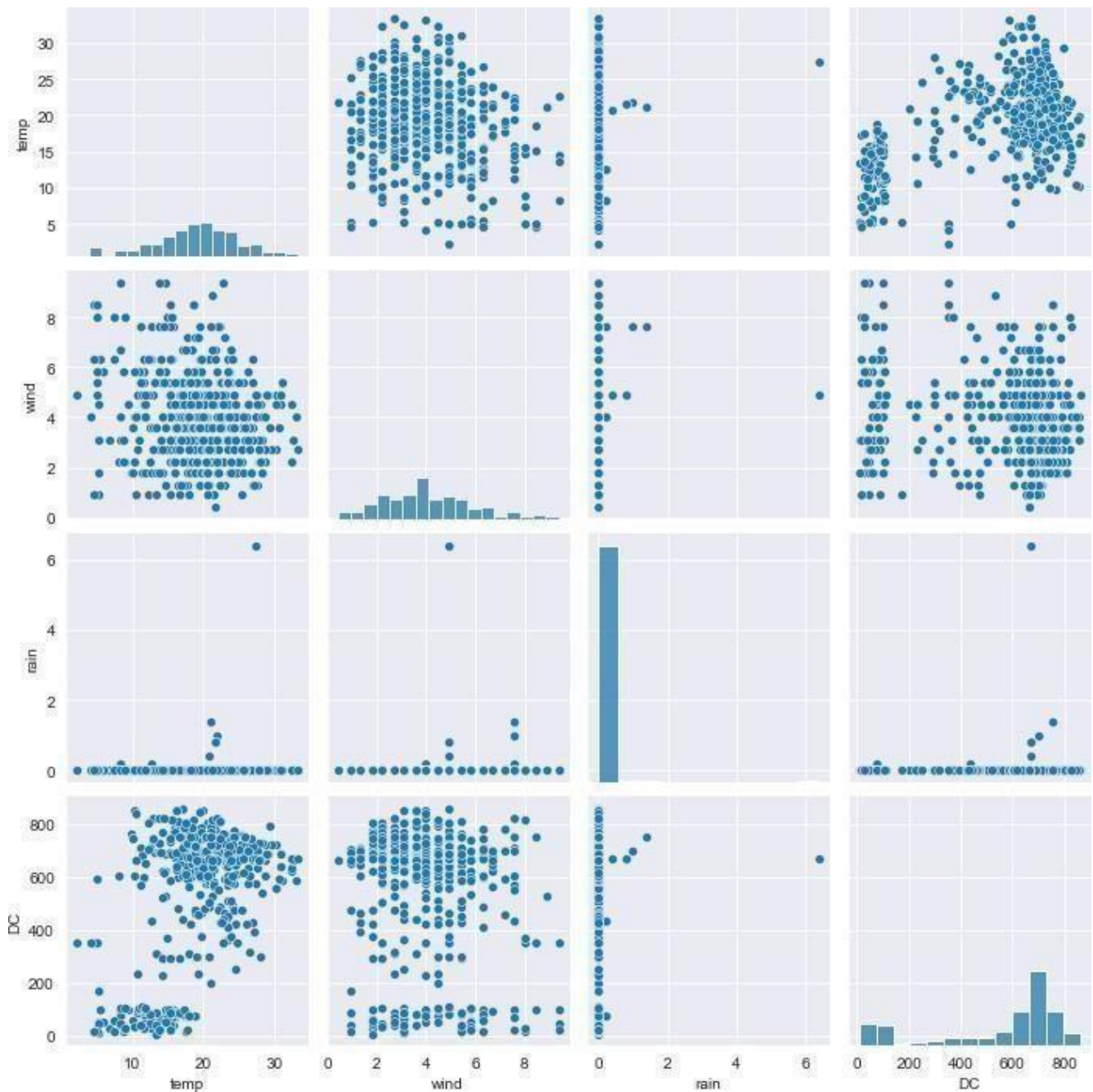
#Print it in list type..
print(list(numerical_feature))

['X', 'Y', 'FFMC', 'DMC', 'DC', 'ISI', 'temp', 'RH', 'wind', 'rain', 'output']

```

In[16]:

```
sns.set_style('darkgrid')  
#Find the relation plot  
lot(fires)  
sns.pairplot(fires[["temp", "wind",  
"rain", "DC"]])plt.show()
```



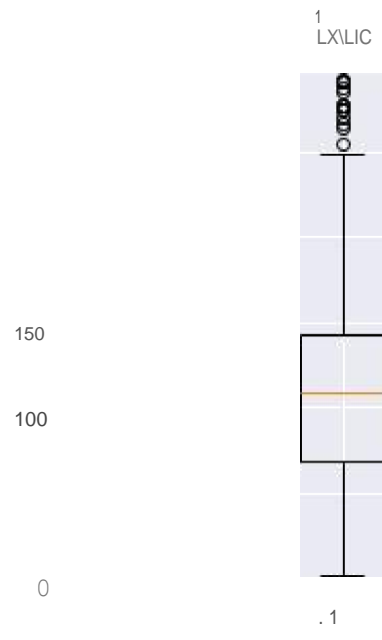
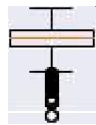
```
In[17]: for idx, col in enumerate(numerical_feature, 1):
plt.figure(figsize=(5,5))

# plt.subplot(len(numerical_feature)//2, 3, idx) plt.boxplot(fires[col])
plt.title(col)
#
# plt.hist(fires[col])
plt.tight_layout()
plt.show(plt)
```

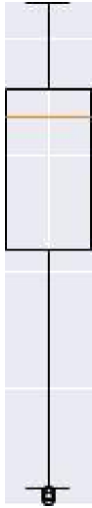
9 Y



1  
FFMC







1



1  
rain

10

0

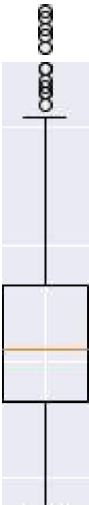
4

3

1

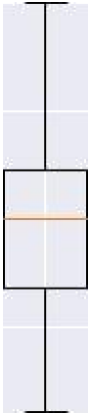
100

RI-J



1

wind



4

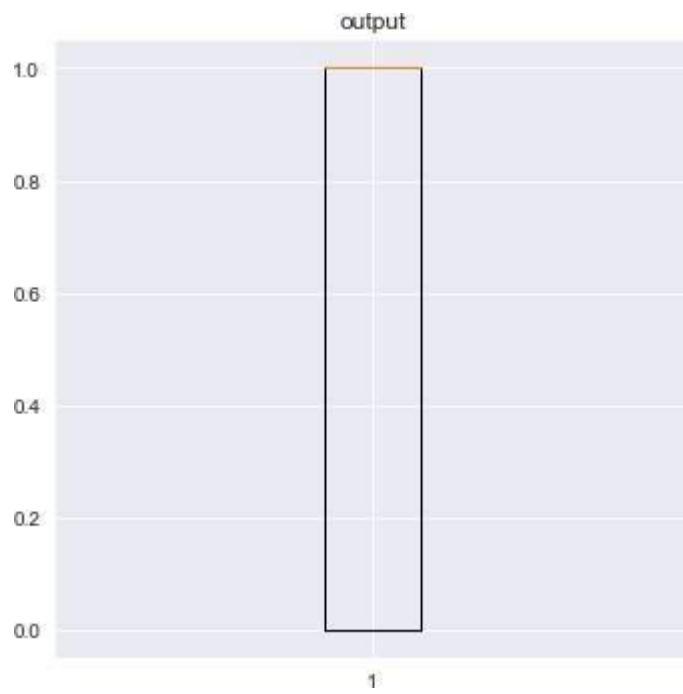
Temp



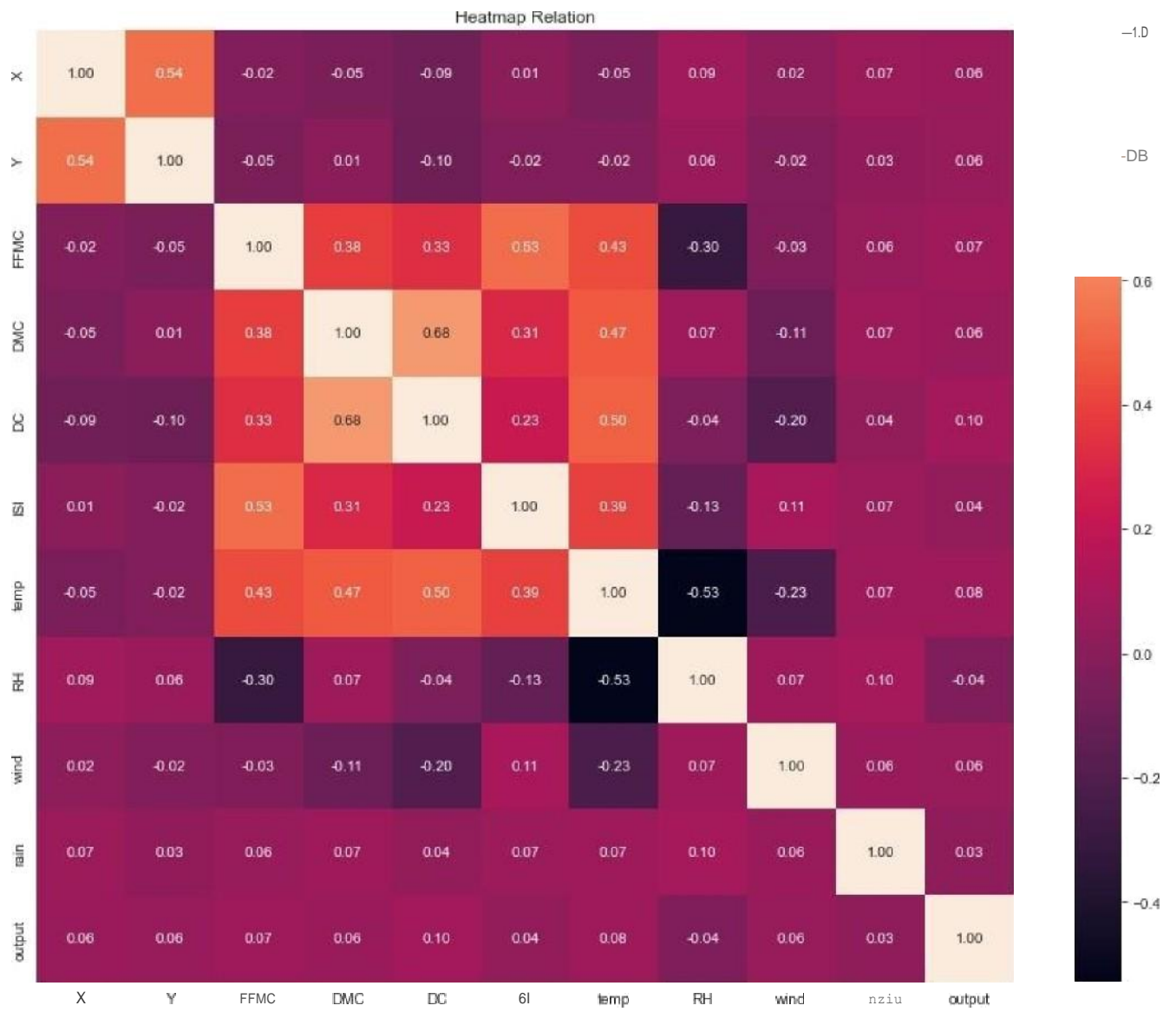
15

10

1



```
In[18]: plt.figure(figsize=(15, 12))    plt.title("Heatmap Relation")
sns.heatmap(fires[numerical_feature].corr(), annot=True, fmt='.2f');
```



```
In[19]: highest_rain=fires.sort_values(by='rain',ascending=False)[['month','day','rain']].head()
highest_rain
```

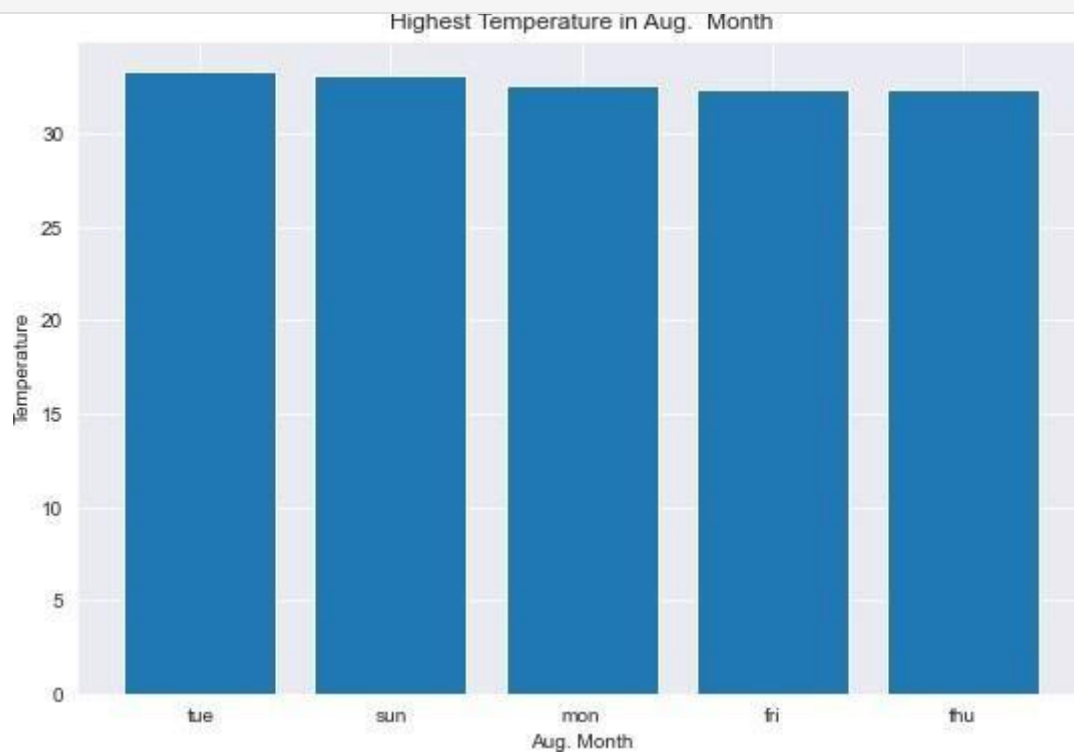
```
Out[19]:
```

	month	day	rain
499	aug	tue	6.4
509	aug	fri	1.4
243	aug	sun	1.0
500	aug	tue	0.8
501	aug	tue	0.8

```
In[20]: highest_temp=fires.sort_values(by='temp',ascending=False)[['month','day','temp']].head()
plt.figure(figsize=(9,6))
plt.title("Highest Temperature in
Aug. Month")plt
t.bar(highest_temp['day'],highest_temp['temp'])

plt.xlabel("Day")plt.xlabel("Aug.
Month")

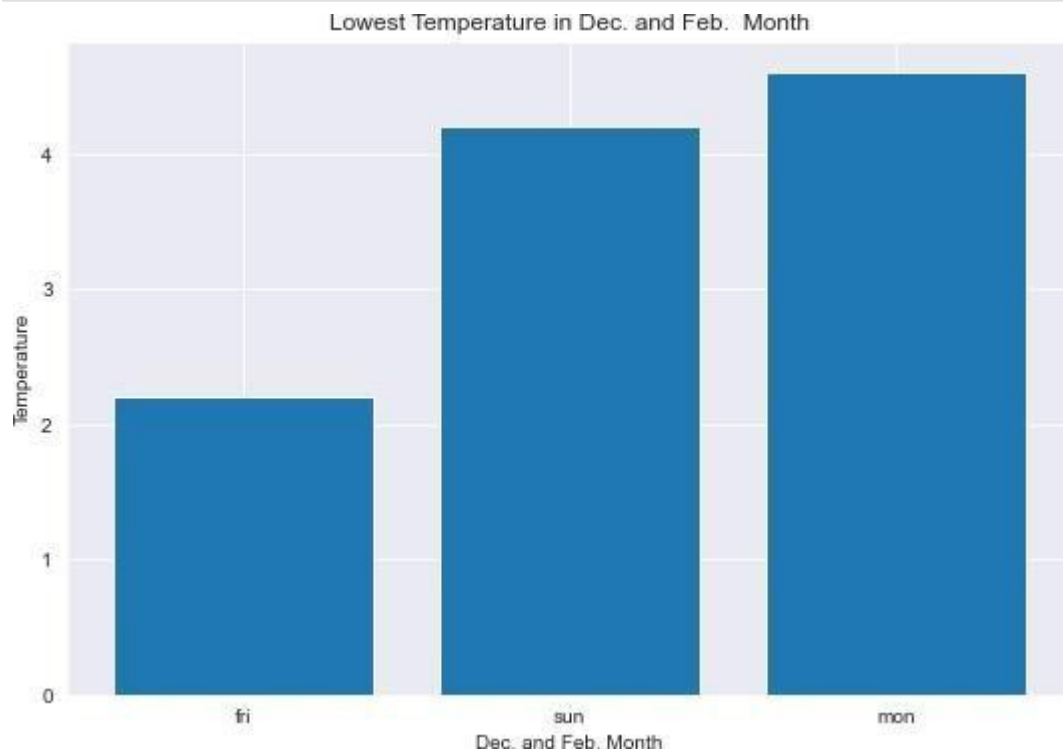
plt.ylabel("Temperature")
plt.show()
```



In[21]:

```
lowest_temp=fires.sort_values(by='temp',ascending=True)[['month','day','temp']].head()
plt.figure(figsize=(9,6))
plt.title("LowestTemperatureinDec.andFeb.Month")
plt.bar(lowest_temp['day'],lowest_temp['temp'])

plt.xlabel("Day")
plt.xlabel("Dec.andFeb.Month")
plt.ylabel("Temperature")plt.show()
```



In[22]:

**fires**

Out[22]:

XY		month	day	FF	MC	DC	ISI	temp	RHwindrainoutput				
0	7	5	mar	fri	86.2	26.2	94.3	5.1	8.2	51	6.7	0.0	0.0
1	7	4	oct	tue	90.6	35.4	669.1	6.7	18.0	33	0.9	0.0	0.0
2	7	4	oct	sat	90.6	43.7	686.9	6.7	14.6	33	1.3	0.0	0.0
3	8	6	mar	fri	91.7	33.3	77.5	9.0	8.3	97	4.0	0.2	0.0
4	8	6	mar	sun	89.3	51.3	102.2	9.6	11.4	99	1.8	0.0	0.0
5	8	6	aug	sun	92.3	85.3	488.0	14.7	22.2	29	5.4	0.0	0.0
6	8	6	aug	mon	92.3	88.9	495.6	8.5	24.1	27	3.1	0.0	0.0
7	8	6	aug	mon	91.5	145.4	608.2	10.7	8.0	86	2.2	0.0	0.0
8	8	6	sep	tue	91.0	129.5	692.6	7.0	13.1	63	5.4	0.0	0.0
9	7	5	sep	sat	92.5	88.0	698.6	7.1	22.8	40	4.0	0.0	0.0
10	7	5	sep	sat	92.5	88.0	698.6	7.1	17.8	51	7.2	0.0	0.0
11	7	5	sep	sat	92.8	73.2	713.0	22.6	19.3	38	4.0	0.0	0.0
12	6	5	aug	fri	63.5	70.8	665.3	0.8	17.0	72	6.7	0.0	0.0
13	6	5	sep	mon	90.9	126.5	686.5	7.0	21.3	42	2.2	0.0	0.0
14	6	5	sep	wed	92.9	133.3	699.6	9.2	26.4	21	4.5	0.0	0.0
15	6	5	sep	fri	93.3	141.2	713.9	13.9	22.9	44	5.4	0.0	0.0
16	5	5	mar	sat	91.7	35.8	80.8	7.8	15.1	27	5.4	0.0	0.0
17	8	5	oct	mon	84.9	32.8	664.2	3.0	16.7	47	4.9	0.0	0.0
18	6	4	mar	wed	89.2	27.9	70.8	6.3	15.9	35	4.0	0.0	0.0
19	6	4	apr	sat	86.3	27.4	97.1	5.1	9.3	44	4.5	0.0	0.0
20	6	4	sep	tue	91.0	129.5	692.6	7.0	18.3	40	2.7	0.0	0.0
21	5	4	sep	mon	91.8	78.5	724.3	9.2	19.1	38	2.7	0.0	0.0
22	7	4	jun	sun	94.3	96.3	200.0	56.1	21.0	44	4.5	0.0	0.0
23	7	4	aug	sat	90.2	110.9	537.4	6.2	19.5	43	5.8	0.0	0.0
24	7	4	aug	sat	93.5	139.4	594.2	20.3	23.7	32	5.8	0.0	0.0
25	7	4	aug	sun	91.4	142.4	601.4	10.6	16.3	60	5.4	0.0	0.0
26	7	4	sep	fri	92.4	117.9	668.0	12.2	19.0	34	5.8	0.0	0.0
27	7	4	sep	mon	90.9	126.5	686.5	7.0	19.4	48	1.3	0.0	0.0
													0.0

**0.0**

286	3	sep	sat	93.4	145.4	721.4	8.1	30.2	24	2.7	0.0	0.0	
29	6	3	sep	sun	93.5	149.3	728.6	8.1	22.8	39	3.6	0.0	0.0
306	3	sep	fri	94.3	85.1	692.3	15.9	25.4	24	3.6	0.0	0.0	
31	6	3	sep	mon	88.6	91.8	709.9	7.1	11.2	78	7.6	0.0	0.0
326	3	sep	fri	88.6	69.7	706.8	5.8	20.6	37	1.8	0.0	0.0	
33	6	3	sep	sun	91.7	75.6	718.3	7.8	17.7	39	3.6	0.0	0.0
346	3	sep	mon	91.8	78.5	724.3	9.2	21.2	32	2.7	0.0	0.0	
35	6	3	sep	tue	90.3	80.7	730.2	6.3	18.2	62	4.5	0.0	0.0
36	6	3	oct	tue	90.6	35.4	669.1	6.7	21.7	24	4.5		0.0

X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	output	
37	7	4	oct	fri	90.0	41.5	682.6	8.7	11.3	60	5.4	0.0	0.0
38	7	3	oct	sat	90.6	43.7	686.9	6.7	17.8	27	4.0	0.0	0.0
39	4	4	mar	tue	88.1	25.7	67.6	3.8	14.1	43	2.7	0.0	0.0
40	4	4	jul	tue	79.5	60.6	366.7	1.5	23.3	37	3.1	0.0	0.0
41	4	4	aug	sat	90.2	96.9	624.2	8.9	18.4	42	6.7	0.0	0.0
42	4	4	aug	tue	94.8	108.3	647.1	17.0	16.6	54	5.4	0.0	0.0
43	4	4	sep	sat	92.5	88.0	698.6	7.1	19.6	48	2.7	0.0	0.0
44	4	4	sep	wed	90.1	82.9	735.7	6.2	12.9	74	4.9	0.0	0.0
45	5	6	sep	wed	94.3	85.1	692.3	15.9	25.9	24	4.0	0.0	0.0
46	5	6	sep	mon	90.9	126.5	686.5	7.0	14.7	70	3.6	0.0	0.0
47	6	6	jul	mon	94.2	62.3	442.9	11.0	23.0	36	3.1	0.0	0.0
48	4	4	mar	mon	87.2	23.9	64.7	4.1	11.8	35	1.8	0.0	0.0
49	4	4	mar	mon	87.6	52.2	103.8	5.0	11.0	46	5.8	0.0	0.0
50	4	4	sep	thu	92.9	137.0	706.4	9.2	20.8	17	1.3	0.0	0.0
51	4	3	aug	sun	90.2	99.6	631.2	6.3	21.5	34	2.2	0.0	0.0
52	4	3	aug	wed	92.1	111.2	654.1	9.6	20.4	42	4.9	0.0	0.0
53	4	3	aug	wed	92.1	111.2	654.1	9.6	20.4	42	4.9	0.0	0.0
54	4	3	aug	thu	91.7	114.3	661.3	6.3	17.6	45	3.6	0.0	0.0
55	4	3	sep	thu	92.9	137.0	706.4	9.2	27.7	24	2.2	0.0	0.0
56	4	3	sep	tue	90.3	80.7	730.2	6.3	17.8	63	4.9	0.0	0.0
57	4	3	oct	sun	92.6	46.5	691.8	8.8	13.8	50	2.7	0.0	0.0



58	2	2	feb	mon	84.0	9.3	34.0	2.1	13.9	40	5.4	0.0	0.0
59	2	2	feb	fri	86.6	13.2	43.0	5.3	12.3	51	0.9	0.0	0.0
60	2	2	mar	sun	89.3	51.3	102.2	9.6	11.5	39	5.8	0.0	0.0
61	2	2	mar	sun	89.3	51.3	102.2	9.6	5.5	59	6.3	0.0	0.0
62	2	2	aug	thu	93.0	75.3	466.6	7.7	18.8	35	4.9	0.0	0.0
63	2	2	aug	sun	90.2	99.6	631.2	6.3	20.8	33	2.7	0.0	0.0
64	2	2	aug	mon	91.1	103.2	638.8	5.8	23.1	31	3.1	0.0	0.0
65	2	2	aug	thu	91.7	114.3	661.3	6.3	18.6	44	4.5	0.0	0.0
66	2	2	sep	fri	92.4	117.9	668.0	12.2	23.0	37	4.5	0.0	0.0
67	2	2	sep	fri	92.4	117.9	668.0	12.2	19.6	33	5.4	0.0	0.0
68	2	2	sep	fri	92.4	117.9	668.0	12.2	19.6	33	6.3	0.0	0.0
69	4	5	mar	fri	91.7	33.3	77.5	9.0	17.2	26	4.5	0.0	0.0
70	4	5	mar	fri	91.2	48.3	97.8	12.5	15.8	27	7.6	0.0	0.0
71	4	5	sep	fri	94.3	85.1	692.3	15.9	17.7	37	3.6	0.0	0.0
72	5	4	mar	fri	91.7	33.3	77.5	9.0	15.6	25	6.3	0.0	0.0
73	5	4	aug	tue	88.8	147.3	614.5	9.0	17.3	43	4.5	0.0	0.0
74	5	4	sep	fri	93.3	141.2	713.9	13.9	27.6	30	1.3	0.0	0.0
75	9	9	feb	thu	84.2	6.8	26.6	7.7	6.7	79	3.1	0.0	0.0
76	9	9	feb	fri	86.6	13.2	43.0	5.3	15.7	43	3.1	0.0	0.0
77	1	3	mar	mon	87.6	52.2	103.8	5.0	8.3	72	3.1	0.0	0.0
78	1	2	aug	fri	90.1	108.0	529.8	12.5	14.7	66	2.7	0.0	0.0
79	1	2	aug	tue	91.0	121.2	561.6	7.0	21.6	19	6.7	0.0	0.0
80	1	2	aug	sun	91.4	142.4	601.4	10.6	19.5	39	6.3	0.0	0.0
81	1	2	aug	sun	90.2	99.6	631.2	6.3	17.9	44	2.2	0.0	0.0
82	1	2	aug	tue	94.8	108.3	647.1	17.0	18.6	51	4.5	0.0	0.0
83	1	2	aug	wed	92.1	111.2	654.1	9.6	16.6	47	0.9	0.0	0.0
84	1	2	aug	thu	91.7	114.3	661.3	6.3	20.2	45	3.6	0.0	0.0
85	1	2	sep	thu	92.9	137.0	706.4	9.2	21.5	15	0.9	0.0	0.0
86	1	2	sep	thu	92.9	137.0	706.4	9.2	25.4	27	2.2	0.0	0.0
87	1	2	sep	thu	92.9	137.0	706.4	9.2	22.4	34	2.2	0.0	0.0
88	1	2	sep	sun	93.5	149.3	728.6	8.1	25.3	36	3.6	0.0	0.0
89	6	5	mar	sat	91.7	35.8	80.8	7.8	17.4	25	4.9	0.0	0.0
90	6	5	aug	sat	90.2	96.9	624.2	8.9	14.7	59	5.8	0.0	0.0
91	8	6	mar	fri	91.7	35.8	80.8	7.8	17.4	24	5.4	0.0	0.0
92	8	6	aug	sun	92.3	85.3	488.0	14.7	20.8	32	6.3	0.0	0.0

0.0

93	86	aug	sun	91.4	142.4	601.4	10.6	18.2	43	4.9	0.0	0.0	
94	86	aug	mon	91.1	103.2	638.8	5.8	23.4	22	2.7	0.0	0.0	
95	44	sep	sun	89.7	90.0	704.4	4.8	17.8	64	1.3	0.0	0.0	
96	34	feb	sat	83.9	8.0	30.2	2.6	12.7	48	1.8	0.0	0.0	
97	34	mar	sat	69.0	2.4	15.5	0.7	17.4	24	5.4	0.0	0.0	
98	34	aug	sun	91.4	142.4	601.4	10.6	11.6	87	4.5	0.0	0.0	
99	34	aug	sun	91.4	142.4	601.4	10.6	19.8	39	5.4	0.0	0.0	
100	3	4	aug	sun	91.4	142.4	601.4	10.6	19.8	39	5.4	0.0	0.0
101	3	4	aug	tue	88.8	147.3	614.5	9.0	14.4	66	5.4	0.0	0.0
102	2	4	aug	tue	94.8	108.3	647.1	17.0	20.1	40	4.0	0.0	0.0
103	2	4	sep	sat	92.5	121.1	674.4	8.6	24.1	29	4.5	0.0	0.0
104	2	4	jan	sat	82.1	3.7	9.3	2.9	5.3	78	3.1	0.0	0.0
105	4	5	mar	fri	85.9	19.5	57.3	2.8	12.7	52	6.3	0.0	0.0
106	4	5	mar	thu	91.4	30.7	74.3	7.5	18.2	29	3.1	0.0	0.0
107	4	5	aug	sun	90.2	99.6	631.2	6.3	21.4	33	3.1	0.0	0.0
108	4	5	sep	sat	92.5	88.0	698.6	7.1	20.3	45	3.1	0.0	0.0
109	4	5	sep	mon	88.6	91.8	709.9	7.1	17.4	56	5.4	0.0	0.0
110	4	4	mar	fri	85.9	19.5	57.3	2.8	13.7	43	5.8		0.0

RH wind rain output												
111	3	4	mar	fri	91.7	33.3	77.5	9.0	18.8	18	4.5	0.0
112	3	4	sep	sun	89.7	90.0	704.4	4.8	22.8	39	3.6	0.0
113	3	4	sep	mon	91.8	78.5	724.3	9.2	18.9	35	2.7	0.0
114	3	4	mar	tue	88.1	25.7	67.6	3.8	15.8	27	7.6	0.0
115	3	5	mar	tue	88.1	25.7	67.6	3.8	15.5	27	6.3	0.0
116	3	4	mar	sat	91.7	35.8	80.8	7.8	11.6	30	6.3	0.0
117	3	4	mar	sat	91.7	35.8	80.8	7.8	15.2	27	4.9	0.0
118	3	4	mar	mon	90.1	39.7	86.6	6.2	10.6	30	4.0	0.0
119	3	4	aug	thu	93.0	75.3	466.6	7.7	19.6	36	3.1	0.0
120	3	4	aug	mon	91.5	145.4	608.2	10.7	10.3	74	2.2	0.0
121	3	4	aug	mon	91.5	145.4	608.2	10.7	17.1	43	5.4	0.0
122	3	4	sep	sun	92.4	124.1	680.7	8.5	22.5	42	5.4	0.0
123	3	4	sep	tue	84.4	73.4	671.9	3.2	17.9	45	3.1	0.0
124	3	4	sep	fri	94.3	85.1	692.3	15.9	19.8	50	5.4	0.0
125	3	4	oct	sun	92.6	46.5	691.8	8.8	20.6	24	5.4	0.0
126	3	5	mar	mon	87.6	52.2	103.8	5.0	9.0	49	2.2	0.0
127	3	5	sep	fri	93.5	149.3	728.6	8.1	17.2	43	3.1	0.0
128	3	5	oct	wed	91.4	37.9	673.8	5.2	15.9	46	3.6	0.0
129	2	5	oct	sun	92.6	46.5	691.8	8.8	15.4	35	0.9	0.0
130	4	6	feb	sat	68.2	21.5	87.2	0.8	15.4	40	2.7	0.0
131	4	6	mar	mon	87.2	23.9	64.7	4.1	14.0	39	3.1	0.0
132	4	6	mar	sun	89.3	51.3	102.2	9.6	10.6	46	4.9	0.0
133	4	6	sep	thu	93.7	80.9	685.2	17.9	17.6	42	3.1	0.0
134	3	5	mar	tue	88.1	25.7	67.6	3.8	14.9	38	2.7	0.0
135	3	5	aug	sat	93.5	139.4	594.2	20.3	17.6	52	5.8	0.0
136	3	6	sep	sun	92.4	124.1	680.7	8.5	17.2	58	1.3	0.0
137	3	6	sep	mon	90.9	126.5	686.5	7.0	15.6	66	3.1	0.0
138	9	9	jul	tue	85.8	48.3	313.4	3.9	18.0	42	2.7	1.0
139	1	4	sep	tue	91.0	129.5	692.6	7.0	21.7	38	2.2	1.0

X Y month			day	FFMC DMC		DC	ISltemp						
140	2	5	sep	mon	90.9	126.5	686.5	7.0	21.9	39	1.8	0.0	1.0
141	1	2	aug	wed	95.5	99.9	513.3	13.2	23.3	31	4.5	0.0	1.0
142	8	6	aug	fri	90.1	108.0	529.8	12.5	21.2	51	8.9	0.0	1.0
143	1	2	jul	sat	90.0	51.3	296.3	8.7	16.6	53	5.4	0.0	1.0
144	2	5	aug	wed	95.5	99.9	513.3	13.2	23.8	32	5.4	0.0	1.0
145	6	5	aug	thu	95.2	131.7	578.8	10.4	27.4	22	4.0	0.0	1.0
146	5	4	mar	mon	90.1	39.7	86.6	6.2	13.2	40	5.4	0.0	1.0
147	8	3	sep	tue	84.4	73.4	671.9	3.2	24.2	28	3.6	0.0	1.0
148	2	2	aug	tue	94.8	108.3	647.1	17.0	17.4	43	6.7	0.0	1.0
149	8	6	sep	thu	93.7	80.9	685.2	17.9	23.7	25	4.5	0.0	1.0
150	6	5	jun	fri	92.5	56.4	433.3	7.1	23.2	39	5.4	0.0	1.0
151	9	9	jul	sun	90.1	68.6	355.2	7.2	24.8	29	2.2	0.0	1.0
152	3	4	jul	sat	90.1	51.2	424.1	6.2	24.6	43	1.8	0.0	1.0
153	5	4	sep	fri	94.3	85.1	692.3	15.9	20.1	47	4.9	0.0	1.0
154	1	5	sep	sat	93.4	145.4	721.4	8.1	29.6	27	2.7	0.0	1.0
155	7	4	aug	sun	94.8	108.3	647.1	17.0	16.4	47	1.3	0.0	1.0
156	2	4	sep	sat	93.4	145.4	721.4	8.1	28.6	27	2.2	0.0	1.0
157	2	2	aug	wed	92.1	111.2	654.1	9.6	18.4	45	3.6	0.0	1.0
158	2	4	aug	wed	92.1	111.2	654.1	9.6	20.5	35	4.0	0.0	1.0
159	7	4	sep	fri	92.4	117.9	668.0	12.2	19.0	34	5.8	0.0	1.0
160	7	4	mar	mon	90.1	39.7	86.6	6.2	16.1	29	3.1	0.0	1.0
161	6	4	aug	thu	95.2	131.7	578.8	10.4	20.3	41	4.0	0.0	1.0
162	6	3	mar	sat	90.6	50.1	100.4	7.8	15.2	31	8.5	0.0	1.0
163	8	6	sep	sat	92.5	121.1	674.4	8.6	17.8	56	1.8	0.0	1.0
164	8	5	sep	sun	89.7	90.0	704.4	4.8	17.8	67	2.2	0.0	1.0
165	6	5	mar	thu	84.9	18.2	55.0	3.0	5.3	70	4.5	0.0	1.0
166	6	5	aug	wed	92.1	111.2	654.1	9.6	16.6	47	0.9	0.0	1.0
167	6	5	aug	wed	96.0	127.1	570.5	16.5	23.4	33	4.5	0.0	1.0
168	6	5	mar	fri	91.2	48.3	97.8	12.5	14.6	26	9.4	0.0	1.0
169	8	6	aug	thu	95.2	131.7	578.8	10.4	20.7	45	2.2	0.0	1.0
170	5	4	sep	wed	92.9	133.3	699.6	9.2	21.9	35	1.8	0.0	1.0
171	8	6	aug	wed	85.6	90.4	609.6	6.6	17.4	50	4.0	0.0	1.0
172	7	4	aug	sun	91.4	142.4	601.4	10.6	20.1	39	5.4	0.0	1.0
173	4	4	sep	mon	90.9	126.5	686.5	7.0	17.7	39	2.2	0.0	1.0

174	1	4	aug	sat	90.2	96.9	624.2	8.9	14.2	53	1.8	0.0	1.0
175	1	4	aug	sat	90.2	96.9	624.2	8.9	20.3	39	4.9	0.0	1.0
176	6	5	apr	thu	81.5	9.1	55.2	2.7	5.8	54	5.8	0.0	1.0
177	2	5	aug	sun	90.2	99.6	631.2	6.3	19.2	44	2.7	0.0	1.0
178	2	5	sep	wed	90.1	82.9	735.7	6.2	18.3	45	2.2	0.0	1.0
179	8	6	aug	tue	88.8	147.3	614.5	9.0	14.4	66	5.4	0.0	1.0
180	1	3	sep	sun	92.4	124.1	680.7	8.5	23.9	32	6.7	0.0	1.0
181	8	6	oct	mon	84.9	32.8	664.2	3.0	19.1	32	4.0	0.0	1.0
182	5	4	feb	sun	86.8	15.6	48.3	3.9	12.4	53	2.2	0.0	1.0
183	7	4	oct	mon	91.7	48.5	696.1	11.1	16.8	45	4.5	0.0	1.0
184	8	6	aug	fri	93.9	135.7	586.7	15.1	20.8	34	4.9	1.0	RH wind rainoutput
185	2	5	sep	tue	91.0	129.5	692.6	7.0	17.6	46	3.1	0.0	1.0
186	8	6	mar	sun	89.3	51.3	102.2	9.6	11.5	39	5.8	0.0	1.0
187	1	5	sep	mon	90.9	126.5	686.5	7.0	21.0	42	2.2	0.0	1.0
188	6	4	mar	sat	90.8	41.9	89.4	7.9	13.3	42	0.9	0.0	1.0
189	7	4	mar	sun	90.7	44.0	92.4	5.5	11.5	60	4.0	0.0	1.0
190	6	5	mar	fri	91.2	48.3	97.8	12.5	11.7	33	4.0	0.0	1.0
191	2	5	aug	thu	95.2	131.7	578.8	10.4	24.2	28	2.7	0.0	1.0
192	2	2	aug	tue	94.8	108.3	647.1	17.0	24.6	22	4.5	0.0	1.0
193	4	5	sep	wed	92.9	133.3	699.6	9.2	24.3	25	4.0	0.0	1.0
194	2	2	aug	tue	94.8	108.3	647.1	17.0	24.6	22	4.5	0.0	1.0
195	2	5	aug	fri	93.9	135.7	586.7	15.1	23.5	36	5.4	0.0	1.0
196	6	5	apr	thu	81.5	9.1	55.2	2.7	5.8	54	5.8	0.0	1.0
197	4	5	sep	thu	92.9	137.0	706.4	9.2	21.5	15	0.9	0.0	1.0
198	3	4	sep	tue	91.0	129.5	692.6	7.0	13.9	59	6.3	0.0	1.0
199	2	4	sep	mon	63.5	70.8	665.3	0.8	22.6	38	3.6	0.0	1.0
200	1	5	sep	tue	91.0	129.5	692.6	7.0	21.6	33	2.2	0.0	1.0
201	6	5	mar	sun	90.1	37.6	83.7	7.2	12.4	54	3.6	0.0	1.0
202	7	4	feb	sun	83.9	8.7	32.1	2.1	8.8	68	2.2	0.0	1.0
203	8	6	oct	wed	91.4	37.9	673.8	5.2	20.2	37	2.7	0.0	1.0
204	5	6	mar	sat	90.6	50.1	100.4	7.8	15.1	64	4.0	0.0	1.0

0.0

X Y month			day	FFMC DMC		DC	ISltemp						
205	4	5	sep	thu	92.9	137.0	706.4	9.2	22.1	34	1.8	0.0	1.0
206	2	2	aug	sat	93.5	139.4	594.2	20.3	22.9	31	7.2	0.0	1.0
207	7	5	sep	tue	91.0	129.5	692.6	7.0	20.7	37	2.2	0.0	1.0
208	6	5	sep	fri	92.4	117.9	668.0	12.2	19.6	33	6.3	0.0	1.0
209	8	3	sep	thu	93.7	80.9	685.2	17.9	23.2	26	4.9	0.0	1.0
210	4	4	oct	sat	90.6	43.7	686.9	6.7	18.4	25	3.1	0.0	1.0
211	7	4	aug	sat	93.5	139.4	594.2	20.3	5.1	96	5.8	0.0	1.0
212	7	4	sep	fri	94.3	85.1	692.3	15.9	20.1	47	4.9	0.0	1.0
213	7	3	marmon		87.6	52.2	103.8	5.0	11.0	46	5.8	0.0	1.0
214	4	4	mar	sat	91.7	35.8	80.8	7.8	17.0	27	4.9	0.0	1.0
215	4	4	mar	sat	91.7	35.8	80.8	7.8	17.0	27	4.9	0.0	1.0
216	4	4	sep	sun	92.4	124.1	680.7	8.5	16.9	60	1.3	0.0	1.0
217	1	3	sep	mon	88.6	91.8	709.9	7.1	12.4	73	6.3	0.0	1.0
218	4	5	sep	wed	92.9	133.3	699.6	9.2	19.4	19	1.3	0.0	1.0
219	6	5	marmon		90.1	39.7	86.6	6.2	15.2	27	3.1	0.0	1.0
220	8	6	aug	sun	90.2	99.6	631.2	6.3	16.2	59	3.1	0.0	1.0
221	3	4	sep	fri	93.3	141.2	713.9	13.9	18.6	49	3.6	0.0	1.0



X Y month			day		FFMC DMC		DC	ISI	temp	RH	wind	rain	output
249	3	4	aug	wed	93.1	157.3	666.7	13.5	21.7	40	0.4	0.0	1.0
250	8	5	aug	wed	93.1	157.3	666.7	13.5	26.8	25	3.1	0.0	1.0
251	8	5	aug	wed	93.1	157.3	666.7	13.5	24.0	36	3.1	0.0	1.0
252	6	5	aug	wed	93.1	157.3	666.7	13.5	22.1	37	3.6	0.0	1.0
253	7	4	aug	thu	91.9	109.2	565.5	8.0	21.4	38	2.7	0.0	1.0
254	6	3	aug	thu	91.6	138.1	621.7	6.3	18.9	41	3.1	0.0	1.0
255	2	5	aug	thu	87.5	77.0	694.8	5.0	22.3	46	4.0	0.0	0.0
256	8	6	aug	sat	94.2	117.2	581.1	11.0	23.9	41	2.2	0.0	1.0
257	4	3	aug	sat	94.2	117.2	581.1	11.0	21.4	44	2.7	0.0	1.0
258	3	4	aug		91.8	170.9	692.3	13.7	20.6	59	0.9		0.0
259	7	4	aug	sat	91.8	170.9	692.3	13.7	23.7	40	1.8	0.0	1.0
260	2	4	aug	mon	93.6	97.9	542.0	14.4	28.3	32	4.0	0.0	1.0
261	3	4	aug	fri	91.6	112.4	573.0	8.9	11.2	84	7.6	0.0	1.0
262	2	4	aug	fri	91.6	112.4	573.0	8.9	21.4	42	3.1	0.0	1.0
263	6	3	aug	fri	91.1	141.1	629.1	7.1	19.3	39	3.6	0.0	1.0
264	4	4	aug	fri	94.3	167.6	684.4	13.0	21.8	53	3.1	0.0	1.0
265	4	4	aug	tue	93.7	102.2	550.3	14.6	22.1	54	7.6	0.0	1.0
266	6	5	aug	tue	94.3	131.7	607.1	22.7	19.4	55	4.0	0.0	1.0
267	2	2	aug	tue	92.1	152.6	658.2	14.3	23.7	24	3.1	0.0	0.0
268	3	4	aug	tue	92.1	152.6	658.2	14.3	21.0	32	3.1	0.0	0.0
269	4	4	aug	tue	92.1	152.6	658.2	14.3	19.1	53	2.7	0.0	1.0
270	2	2	aug	tue	92.1	152.6	658.2	14.3	21.8	56	3.1	0.0	1.0
271	8	6	aug	tue	92.1	152.6	658.2	14.3	20.1	58	4.5	0.0	1.0
272	2	5	aug	tue	92.1	152.6	658.2	14.3	20.2	47	4.0	0.0	1.0
273	4	6	dec	sun	84.4	27.2	353.5	6.8	4.8	57	8.5	0.0	1.0
274	8	6	dec	wed	84.0	27.8	354.6	5.3	5.1	61	8.0	0.0	1.0
275	4	6	dec	thu	84.6	26.4	352.0	2.0	5.1	61	4.9	0.0	1.0



[illegible]

X Y month			day		FFMC DMC		DC	ISI	temp	RH wind rainoutput			
303	3	6	jun	fri	91.1	94.1	232.1	7.1	19.2	38	4.5	0.0	0.0
304	6	5	may	sat	85.1	28.0	113.8	3.5	11.3	94	4.9	0.0	0.0
305	1	4	sep	sun	89.6	84.1	714.3	5.7	19.0	52	2.2	0.0	0.0
306	7	4	sep	sun	89.6	84.1	714.3	5.7	17.1	53	5.4	0.0	1.0
307	3	4	sep	sun	89.6	84.1	714.3	5.7	23.8	35	3.6	0.0	1.0
308	2	4	sep	sun	92.4	105.8	758.1	9.9	16.0	45	1.8	0.0	0.0
309	2	4	sep	sun	92.4	105.8	758.1	9.9	24.9	27	2.2	0.0	0.0
310	7	4	sep	sun	92.4	105.8	758.1	9.9	25.3	27	2.7	0.0	0.0
311	6	3	sep	sun	92.4	105.8	758.1	9.9	24.8	28	1.8	0.0	1.0
312	2	4	sep	sun	50.4	46.2	706.6	0.4	12.2	78	6.3	0.0	0.0
313	6	5	sep	wed	92.6	115.4	777.1	8.8	24.3	27	4.9	0.0	0.0
314	4	4	sep	wed	92.6	115.4	777.1	8.8	19.7	41	1.8	0.0	1.0
315	3	4	sep	wed	91.2	134.7	817.5	7.2	18.5	30	2.7	0.0	0.0
316	4	5	sep	thu	92.4	96.2	739.4	8.6	18.6	24	5.8	0.0	0.0
317	4	4	sep	thu	92.4	96.2	739.4	8.6	19.2	24	4.9	0.0	1.0
318	6	5	sep	thu	92.8	119.0	783.5	7.5	21.6	27	2.2	0.0	0.0
319	5	4	sep	thu	92.8	119.0	783.5	7.5	21.6	28	6.3	0.0	1.0
320	6	3	sep	thu	92.8	119.0	783.5	7.5	18.9	34	7.2	0.0	1.0
321	1	4	sep	thu	92.8	119.0	783.5	7.5	16.8	28	4.0	0.0	1.0
322	6	5	sep	thu	92.8	119.0	783.5	7.5	16.8	28	4.0	0.0	1.0
323	3	5	sep	thu	90.7	136.9	822.8	6.8	12.9	39	2.7	0.0	1.0
324	6	5	sep	thu	88.1	53.3	726.9	5.4	13.7	56	1.8	0.0	1.0
325	1	4	sep	sat	92.2	102.3	751.5	8.4	24.2	27	3.1	0.0	0.0
326	5	4	sep	sat	92.2	102.3	751.5	8.4	24.1	27	3.1	0.0	0.0
327	6	5	sep	sat	92.2	102.3	751.5	8.4	21.2	32	2.2	0.0	0.0
328	6	5	sep	sat	92.2	102.3	751.5	8.4	19.7	35	1.8	0.0	0.0
329	4	3	sep	sat	92.2	102.3	751.5	8.4	23.5	27	4.0	0.0	1.0

[illegible]

X Y month			day	FFMC DMC		DC	ISI	temp	RH wind rainoutput				
357	6	3	sep	fri	92.5	122.0	789.7	10.2	15.9	55	3.6	0.0	0.0
358	6	3	sep	fri	92.5	122.0	789.7	10.2	19.7	39	2.7	0.0	0.0
359	1	4	sep	fri	92.5	122.0	789.7	10.2	21.1	39	2.2	0.0	1.0
360	6	5	sep	fri	92.5	122.0	789.7	10.2	18.4	42	2.2	0.0	1.0
361	4	3	sep	fri	92.5	122.0	789.7	10.2	17.3	45	4.0	0.0	1.0
362	7	4	sep	fri	88.2	55.2	732.3	11.6	15.2	64	3.1	0.0	1.0
363	4	3	sep	tue	91.9	111.7	770.3	6.5	15.9	53	2.2	0.0	1.0
364	6	5	sep	tue	91.9	111.7	770.3	6.5	21.1	35	2.7	0.0	1.0
365	6	5	sep	tue	91.9	111.7	770.3	6.5	19.6	45	3.1	0.0	1.0
366	4	5	sep	tue	91.1	132.3	812.1	12.5	15.9	38	5.4	0.0	1.0
367	4	5	sep	tue	91.1	132.3	812.1	12.5	16.4	27	3.6	0.0	0.0
368	6	5	sep	sat	91.2	94.3	744.4	8.4	16.8	47	4.9	0.0	1.0
369	4	5	sep	sun	91.0	276.3	825.1	7.1	13.8	77	7.6	0.0	0.0



396	4 3	sep	sun	90.5	96.7	750.5	11.4	20.4	55	4.9	0.0	1.0
397	5 6	aug	sun	91.6	181.3	613.0	7.6	24.3	33	3.6	0.0	1.0
398	1 2	aug	sat	93.7	231.1	715.1	8.4	25.9	32	3.1	0.0	0.0
399	9 5	jun	wed	93.3	49.5	297.7	14.0	28.0	34	4.5	0.0	0.0
400	9 5	jun	wed	93.3	49.5	297.7	14.0	28.0	34	4.5	0.0	1.0
401	3 4	sep	thu	91.1	88.2	731.7	8.3	22.8	46	4.0	0.0	1.0
402	9 9	aug	fri	94.8	227.0	706.7	12.0	25.0	36	4.0	0.0	0.0
403	8 6	aug	thu	90.7	194.1	643.0	6.8	21.3	41	3.6	0.0	0.0
404	2 4	sep	wed	87.9	84.8	725.1	3.7	21.8	34	2.2	0.0	1.0
405	2 2	aug	tue	94.6	212.1	680.9	9.5	27.9	27	2.2	0.0	0.0
406	6 5	sep		87.12	91.38	60.6	4.0	17.0	67	4.9	0.0	
407	4 5	feb	sat	84.7	8.2	55.0	2.9	14.2	46	4.0	0.0	0.0
408	4 3	sep	fri	90.3	290.0	855.3	7.4	19.9	44	3.1	0.0	1.0
409	1 4	jul	tue	92.3	96.2	450.2	12.1	23.4	31	5.4	0.0	0.0
410	6 3	feb	fri	84.1	7.3	52.8	2.7	14.7	42	2.7	0.0	0.0
411	7 4	feb	fri	84.6	3.2	43.6	3.3	8.2	53	9.4	0.0	1.0
412	9 4	jul	mon	92.3	92.1	442.1	9.8	22.8	27	4.5	0.0	1.0
413	7 5	aug	sat	93.7	231.1	715.1	8.4	26.4	33	3.6	0.0	0.0
414	5 4	aug	sun	93.6	235.1	723.1	10.1	24.1	50	4.0	0.0	0.0
415	8 6	aug	thu	94.8	222.4	698.6	13.9	27.5	27	4.9	0.0	1.0
416	6 3	jul	tue	92.7	164.1	575.8	8.9	26.3	39	3.1	0.0	1.0
417	6 5	mar	wed	93.4	17.3	28.3	9.9	13.8	24	5.8	0.0	0.0
418	2 4	aug	sun	92.0	203.2	664.5	8.1	24.9	42	5.4	0.0	1.0
419	2 5	aug	sun	91.6	181.3	613.0	7.6	24.8	36	4.0	0.0	1.0
420	8 8	aug	wed	91.7	191.4	635.9	7.8	26.2	36	4.5	0.0	1.0
421	2 4	aug	wed	95.2	217.7	690.0	18.0	30.8	19	4.5	0.0	0.0
422	8 6	jul	sun	88.9	263.1	795.9	5.2	29.3	27	3.6	0.0	1.0

423	1	3	sep	sat	91.2	94.3	744.4	8.4	22.3	48	4.0	0.0	1.0
424	8	6	aug	sat	93.7	231.1	715.1	8.4	26.9	31	3.6	0.0	1.0
425	2	2	aug	thu	91.6	248.4	753.8	6.3	20.4	56	2.2	0.0	0.0
426	8	6	aug	thu	91.6	248.4	753.8	6.3	20.4	56	2.2	0.0	0.0
427	2	4	aug	mon	92.1	207.0	672.6	8.2	27.9	33	2.2	0.0	1.0
428	1	3	aug	thu	94.8	222.4	698.6	13.9	26.2	34	5.8	0.0	0.0
429	3	4	aug	sun	91.6	181.3	613.0	7.6	24.6	44	4.0	0.0	1.0
430	7	4	sep	thu	89.7	287.2	849.3	6.8	19.4	45	3.6	0.0	0.0
431	1	3	aug	sat	92.1	178.0	605.3	9.6	23.3	40	4.0	0.0	1.0
432	8	6	aug	thu	94.8	222.4	698.6	13.9	23.9	38	6.7	0.0	0.0
433	2	4	aug	sun	93.6	235.1	723.1	10.1	20.9	66	4.9	0.0	1.0
434	1	4	aug	fri	90.6	269.8	811.2	5.5	22.2	45	3.6	0.0	0.0
435	2	5	jul	sat	90.8	84.7	376.6	5.6	23.8	51	1.8	0.0	0.0
436	8	6	aug	mon	92.1	207.0	672.6	8.2	26.8	35	1.3	0.0	1.0
437	8	6	aug	sat	89.4	253.6	768.4	9.7	14.2	73	2.7	0.0	0.0
438	2	5	aug	sat	93.7	231.1	715.1	8.4	23.6	53	4.0	0.0	1.0
439	1	3	sep	fri	91.1	91.3	738.1	7.2	19.1	46	2.2	0.0	1.0
440	5	4	sep	fri	90.3	290.0	855.3	7.4	16.2	58	3.6	0.0	0.0
441	8	6	aug	mon	92.1	207.0	672.6	8.2	25.5	29	1.8	0.0	1.0
442	6	5	apr	mon	87.9	24.9	41.6	3.7	10.9	64	3.1	0.0	1.0
443	1	2	jul	fri	90.7	80.9	368.3	16.8	14.8	78	8.0	0.0	0.0

X Y month day FFMC DMC DC ISI temp RH

wwinidndrainnaionutpoutput

444	2	5	sep	fri	90.3	290.0	855.3	7.4	16.2	58	3.6	0.0	1.0
445	5	5	aug	sun	94.0	47.9	100.7	10.7	17.3	80	4.5	0.0	0.0
446	6	5	aug	sun	92.0	203.2	664.5	8.1	19.1	70	2.2	0.0	0.0
447	3	4	mar	wed	93.4	17.3	28.3	9.9	8.9	35	8.0	0.0	0.0

1.0

448	7 4	sep	wed	89.7	284.9	844.0	10.1	10.5	77	4.0	0.0	0.0
449	7 4	aug	sun	91.6	181.3	613.0	7.6	19.3	61	4.9	0.0	0.0
450	4 5	aug	wed	95.2	217.7	690.0	18.0	23.4	49	5.4	0.0	1.0
451	1 4	aug	fri	90.5	196.8	649.9	16.3	11.8	88	4.9	0.0	1.0
452	7 4	aug	mon	91.5	238.2	730.6	7.5	17.7	65	4.0	0.0	0.0
453	4 5	aug	thu	89.4	266.2	803.3	5.6	17.4	54	3.1	0.0	0.0
454	3 4	aug	thu	91.6	248.4	753.8	6.3	16.8	56	3.1	0.0	0.0
455	3 4	jul	mon	94.6	160.0	567.2	16.7	17.9	48	2.7	0.0	0.0
456	2 4	aug	thu	91.6	248.4	753.8	6.3	16.6	59	2.7	0.0	0.0
457	1 4	aug	wed	91.7	191.4	635.9	7.8	19.9	50	4.0	0.0	1.0
458	8 6	aug	sat	93.7	231.1	715.1	8.4	18.9	64	4.9	0.0	1.0
459	7 4	aug	sat	91.6	273.8	819.1	7.7	15.5	72	8.0	0.0	1.0
460	2 5	aug	sat	93.7	231.1	715.1	8.4	18.9	64	4.9	0.0	0.0
461	8 6	aug	sat	93.7	231.1	715.1	8.4	18.9	64	4.9	0.0	0.0
462	1 4	sep	sun	91.0	276.3	825.1	7.1	14.5	76	7.6	0.0	1.0
463	6 5	feb	tue	75.1	4.4	16.2	1.9	4.6	82	6.3	0.0	1.0
464	6 4	feb	tue	75.1	4.4	16.2	1.9	5.1	77	5.4	0.0	1.0
465	2 2	feb	sat	79.5	3.6	15.3	1.8	4.6	59	0.9	0.0	1.0
466	6 5	mar	mon	87.2	15.1	36.9	7.1	10.2	45	5.8	0.0	1.0
467	3 4	mar	wed	90.2	18.5	41.1	7.3	11.2	41	5.4	0.0	1.0
468	6 5	mar	thu	91.3	20.6	43.5	8.5	13.3	27	3.6	0.0	1.0
469	6 3	apr	sun	91.0	14.6	25.6	12.3	13.7	33	9.4	0.0	1.0
470	5 4	apr	sun	91.0	14.6	25.6	12.3	17.6	27	5.8	0.0	0.0
471	4 3	may	fri	89.6	25.4	73.7	5.7	18.0	40	4.0	0.0	1.0
472	8 3	jun	mon	88.2	96.2	229.0	4.7	14.3	79	4.0	0.0	1.0
473	9 4	jun	sat	90.5	61.1	252.6	9.4	24.5	50	3.1	0.0	1.0
474	4 3	jun	thu	93.0	103.8	316.7	10.8	26.4	35	2.7	0.0	1.0



475	2 5	jun	thu	93.7	121.7	350.2	18.0	22.7	40	9.4	0.0	1.0	
476	4 3	jul	thu	93.5	85.3	395.0	9.9	27.2	28	1.3	0.0	1.0	
477	4 3	jul	sun	93.7	101.3	423.4	14.7	26.1	45	4.0	0.0	1.0	
478	7 4	jul	sun	93.7	101.3	423.4	14.7	18.2	82	4.5	0.0	1.0	
479	7 4	jul	mon	89.2	103.9	431.6	6.4	22.6	57	4.9	0.0	1.0	
480	99 XY	jul month	thu day	93.2114.4560.0	FFMC DMC	DC	9.5	30.2	25	4.5	0.0		
							IS	temp		RH	wind	rain	output
481	4 3	jul	thu	93.2	114.4	560.0	9.5	30.2	22	4.9	0.0	0.0	
482	3 4	aug	sun	94.9	130.3	587.1	14.1	23.4	40	5.8	0.0	1.0	
483	8 6	aug	sun	94.9	130.3	587.1	14.1	31.0	27	5.4	0.0	0.0	
484	2 5	aug	sun	94.9	130.3	587.1	14.1	33.1	25	4.0	0.0	1.0	
485	2 4	aug	mon	95.0	135.5	596.3	21.3	30.6	28	3.6	0.0	1.0	
486	5 4	aug	tue	95.1	141.3	605.8	17.7	24.1	43	6.3	0.0	1.0	
487	5 4	aug	tue	95.1	141.3	605.8	17.7	26.4	34	3.6	0.0	1.0	
488	4 4	aug	tue	95.1	141.3	605.8	17.7	19.4	71	7.6	0.0	1.0	
489	4 4	aug	wed	95.1	141.3	605.8	17.7	20.6	58	1.3	0.0	0.0	
490	4 4	aug	wed	95.1	141.3	605.8	17.7	28.7	33	4.0	0.0	0.0	
491	4 4	aug	thu	95.8	152.0	624.1	13.8	32.4	21	4.5	0.0	0.0	
492	1 3	aug	fri	95.9	158.0	633.6	11.3	32.4	27	2.2	0.0	0.0	
493	1 3	aug	fri	95.9	158.0	633.6	11.3	27.5	29	4.5	0.0	1.0	
494	6 6	aug	sat	96.0	164.0	643.0	14.0	30.8	30	4.9	0.0	1.0	
495	6 6	aug	mon	96.2	175.5	661.8	16.8	23.9	42	2.2	0.0	0.0	
496	4 5	aug	mon	96.2	175.5	661.8	16.8	32.6	26	3.1	0.0	1.0	
497	3 4	aug	tue	96.1	181.1	671.2	14.3	32.3	27	2.2	0.0	1.0	
498	6 5	aug	tue	96.1	181.1	671.2	14.3	33.3	26	2.7	0.0	1.0	
499	7 5	aug	tue	96.1	181.1	671.2	14.3	27.3	63	4.9	6.4	1.0	
500	8 6	aug	tue	96.1	181.1	671.2	14.3	21.6	65	4.9	0.8	0.0	
501	7 5	aug	tue	96.1	181.1	671.2	14.3	21.6	65	4.9	0.8	0.0	
502	4 4	aug	tue	96.1	181.1	671.2	14.3	20.7	69	4.9	0.4	0.0	

503	2	4	aug	wed	94.5	139.4	689.1	20.0	29.2	30	4.9	0.0	1.0
504	4	3	aug	wed	94.5	139.4	689.1	20.0	28.9	29	4.9	0.0	1.0
505	1	2	aug	thu	91.0	163.2	744.4	10.1	26.7	35	1.8	0.0	1.0
506	1	2	aug	fri	91.0	166.9	752.6	7.1	18.5	73	8.5	0.0	0.0
507	2	4	aug	fri	91.0	166.9	752.6	7.1	25.9	41	3.6	0.0	0.0
508	1	2	aug	fri	91.0	166.9	752.6	7.1	25.9	41	3.6	0.0	0.0
509	5	4	aug	fri	91.0	166.9	752.6	7.1	21.1	71	7.6	1.4	1.0
510	6	5	aug	fri	91.0	166.9	752.6	7.1	18.2	62	5.4	0.0	1.0
511	8	6	aug	sun	81.6	56.7	665.6	1.9	27.8	35	2.7	0.0	0.0
512	4	3	aug	sun	81.6	56.7	665.6	1.9	27.8	32	2.7	0.0	1.0
513	2	4	aug	sun	81.6	56.7	665.6	1.9	21.9	71	5.8	0.0	1.0
514	7	4	aug	sun	81.6	56.7	665.6	1.9	21.2	70	6.7	0.0	1.0
515	1	4	aug	sat	94.4	146.0	614.7	11.3	25.6	42	4.0	0.0	0.0
516	63		nov	tue	79.5	3.0	106.7	1.1	11.8	31	4.5	0.0	0.0

In[ ]:

```
In [1]: import keras from keras.preprocessing.image import  
ImageDataGenerator
```

```
In[2]: #Define the parameters/arguments for ImageDataGeneratorclass  
train_datagen=ImageDataGenerator(rescale=1./255,shear_range=0.2,rotation_range=180,zoom_range
```

```
test_datagen=ImageDataGenerator(rescale=1./255)
```

```
In [3]: #Applying ImageDataGenerator functionality to trainset  
x_train=train_datagen.flow_from_directory(r'C:\Users\dhine\Downloads\archive\Dataset\Dataset\  
target_size=(128,128),batch_size=32,  
class_mode='binary')
```

Found 436 images belonging to 2 classes.

```
In [4]: #Applying ImageDataGenerator functionality to testset  
x_test=test_datagen.flow_from_directory(r'C:\Users\dhine\Downloads\archive\Dataset\Dataset\te  
target_size=(128,128),batch_size=32,  
class_mode='binary')
```

Found 121 images belonging to 2 classes.

```
In[5]: #importmodelbuilding libraries  
  
#Todefine Linearinitialisation import Sequential from  
keras.models import Sequential  
#To add layers import Dense from  
keras.layers import Dense  
#Tocreate Convolutionkernelimport Convolution2D  
fromkeras.layersimportConvolution2D  
#import Maxpooling layer from  
keras.layers import MaxPooling2D  
#import flatten layer from keras.layers  
import Flatten import warnings  
warnings.filterwarnings('ignore')
```

```
In[7]: #initializing the model model=Sequential()
```

```
In[8]: #add convolutional layer  
model.add(Convolution2D(32,(3,3),input_shape=(128,128,3),activation='relu')) #add  
maxpooling layer model.add(MaxPooling2D(pool_size=(2,2)))  
#add flatten layer model.add(Flatten())
```

```
In [9]: #add hidden layer
In [10]: model.add(Dense(150,activation='relu')) #add output
In[11]: layermodel.add(Dense(1,activation='sigmoid'))

#configure the learning process model.compile(loss='binary_crossentropy',optimizer="adam",metrics=["accuracy"])

#Training the model model.fit_generator(x_train,steps_per_epoch=14,epochs=10,validation_data=x_test,validation_st
```

Epoch 1/10

14/14[=====]-84s6s/step-loss:4.2334-accuracy:0.5619-val\_loss: 1.3686-val\_accuracy:0.5950Epoch2/10

14/14[=====]-74s5s/step-loss:0.5689-accuracy:0.7362-val\_loss: 0.2423-val\_accuracy:0.8926Epoch3/10

14/14[=====]-123s9s/step-loss:0.2231-accuracy:0.9197-val\_loss: 0.1323-val\_accuracy:0.9669Epoch4/10

14/14[=====]-75s5s/step-loss:0.2170-accuracy:0.9128-val\_loss: 0.1082-val\_accuracy:0.9669Epoch5/10

14/14 [=====] - 129s 10s/step - loss: 0.1918 - accuracy: 0.9151 - val\_loss: 0.1145 - val\_accuracy: 0.9669Epoch 6/10

14/14[=====]-111s8s/step-loss:0.1938-accuracy:0.9037-val\_loss: 0.1030 - val\_accuracy:0.9669

Epoch14/14 [=====7/10

====]

-88s6s/step -loss: 0.1756 -accuracy:0.9312 -val\_ loss: 0.0831-val\_accuracy:0.97528/10

Epoch

14/14[===== -86s 6s/step-loss:0.1564-accuracy:0.9404-val\_ loss: ====]

Epoch 0.1073-val\_accuracy:0.96699/10

14/14[=====

====]-77s6s/step-loss:0.1480-accuracy:0.9427-val\_ loss: 0.0754 - val\_accuracy:0.983510/10

Epoch

[=====

14/14 [=====] -81s6s/step -loss: 0.1641 -accuracy:0.9289 -val\_

loss: 0.0601 - val\_accuracy:0.9835

<keras.callbacks.Historyat0x2546507bf10>Out[11]:

In[12]: model.save("forest1.h5")

```
In [13]: #import load_model from keras.models
keras.models import load_model #import image
classfromkerasfromtensorflow.keras.preprocessing
importimage
#import numpy import
numpy as np
#import cv2 import
```

In [15]: #load the saved model model = load\_model("forest1.h5")

In [16]:

```
img=image.load_img(r'C:\Users\dhine\Downloads\archive\Dataset\Dataset\test_set\with  
fire\skynx=image.img_to_array(img) res = cv2.resize(x, dsize=(128, 128), interpolation=cv2.INTER_CUBIC)  
#expand the image shape x=np.expand_dims(res,axis=0)
```

In[17]:

```
pred=model.predict(x)
```

```
1/1 [=====] - 5s 5s/step
```

```
pred
```