

# EMERGING METHODS FOR EARLY DETECTION OF FOREST FIRES

## PROJECT DEVELOPMENT PHASE

### SPRINT 1

Date	02.11.2022
Team ID	PNT2022TMID31081
Project Name	Emerging Methods For Early Detection Of Forest Fires
Team Lead	V.Pireveenkumar
Team Members	B.Chandru K.Kannan R.Prabakaran

```
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 instance of dataset
fires.head(15)
```

```
Out[6]:
```

	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	area
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

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

```
Out[7]: (517, 13)
```

```
In [8]: #show the Last 10 instances of dataset
fires.tail(15)
```

```
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
516	6	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):
#   Column      Non-Null Count  Dtype
---  -
0    X           517 non-null    int64
1    Y           517 non-null    int64
2    month       517 non-null    object
3    day         517 non-null    object
4    FFMC        517 non-null    float64
5    DMC         517 non-null    float64
6    DC          517 non-null    float64
7    ISI         517 non-null    float64
8    temp        517 non-null    float64
9    RH          517 non-null    int64
10   wind        517 non-null    float64
11   rain        517 non-null    float64
12   area        517 non-null    float64
dtypes: float64(8), int64(3), object(2)
memory usage: 52.6+ KB
```

```
In [10]: #generate descriptive statistics of each attribute
fires.describe().T
```

Out[10]:		count	mean	std	min	25%	50%	75%	max
	<b>X</b>	517.0	4.669246	2.313778	1.0	3.0	4.00	7.00	9.00
	<b>Y</b>	517.0	4.299807	1.229900	2.0	4.0	4.00	5.00	9.00
	<b>FFMC</b>	517.0	90.644681	5.520111	18.7	90.2	91.60	92.90	96.20
	<b>DMC</b>	517.0	110.872340	64.046482	1.1	68.6	108.30	142.40	291.30
	<b>DC</b>	517.0	547.940039	248.066192	7.9	437.7	664.20	713.90	860.60
	<b>ISI</b>	517.0	9.021663	4.559477	0.0	6.5	8.40	10.80	56.10
	<b>temp</b>	517.0	18.889168	5.806625	2.2	15.5	19.30	22.80	33.30
	<b>RH</b>	517.0	44.288201	16.317469	15.0	33.0	42.00	53.00	100.00
	<b>wind</b>	517.0	4.017602	1.791653	0.4	2.7	4.00	4.90	9.40
	<b>rain</b>	517.0	0.021663	0.295959	0.0	0.0	0.00	0.00	6.40
	<b>area</b>	517.0	12.847292	63.655818	0.0	0.0	0.52	6.57	1090.84

```
In [11]: fires['area'].values[fires['area'].values > 0] = 1
#renaming the area attribute to output for clear understanding
fires = fires.rename(columns={'area': 'output'})
fires.head(10)
```

Out[11]:	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	output	
	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

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

Out[12]:

	X	Y	FFMC	DMC	DC	ISI	temp	RH	wind	
<b>X</b>	1.000000	0.539548	-0.021039	-0.048384	-0.085916	0.006210	-0.051258	0.085223	0.018798	0.065
<b>Y</b>	0.539548	1.000000	-0.046308	0.007782	-0.101178	-0.024488	-0.024103	0.062221	-0.020341	0.033
<b>FFMC</b>	-0.021039	-0.046308	1.000000	0.382619	0.330512	0.531805	0.431532	-0.300995	-0.028485	0.056
<b>DMC</b>	-0.048384	0.007782	0.382619	1.000000	0.682192	0.305128	0.469594	0.073795	-0.105342	0.074
<b>DC</b>	-0.085916	-0.101178	0.330512	0.682192	1.000000	0.229154	0.496208	-0.039192	-0.203466	0.035
<b>ISI</b>	0.006210	-0.024488	0.531805	0.305128	0.229154	1.000000	0.394287	-0.132517	0.106826	0.067
<b>temp</b>	-0.051258	-0.024103	0.431532	0.469594	0.496208	0.394287	1.000000	-0.527390	-0.227116	0.069
<b>RH</b>	0.085223	0.062221	-0.300995	0.073795	-0.039192	-0.132517	-0.527390	1.000000	0.069410	0.099
<b>wind</b>	0.018798	-0.020341	-0.028485	-0.105342	-0.203466	0.106826	-0.227116	0.069410	1.000000	0.061
<b>rain</b>	0.065387	0.033234	0.056702	0.074790	0.035861	0.067668	0.069491	0.099751	0.061119	1.000
<b>output</b>	0.062491	0.056892	0.073823	0.062672	0.096724	0.035663	0.076047	-0.035587	0.055702	0.025

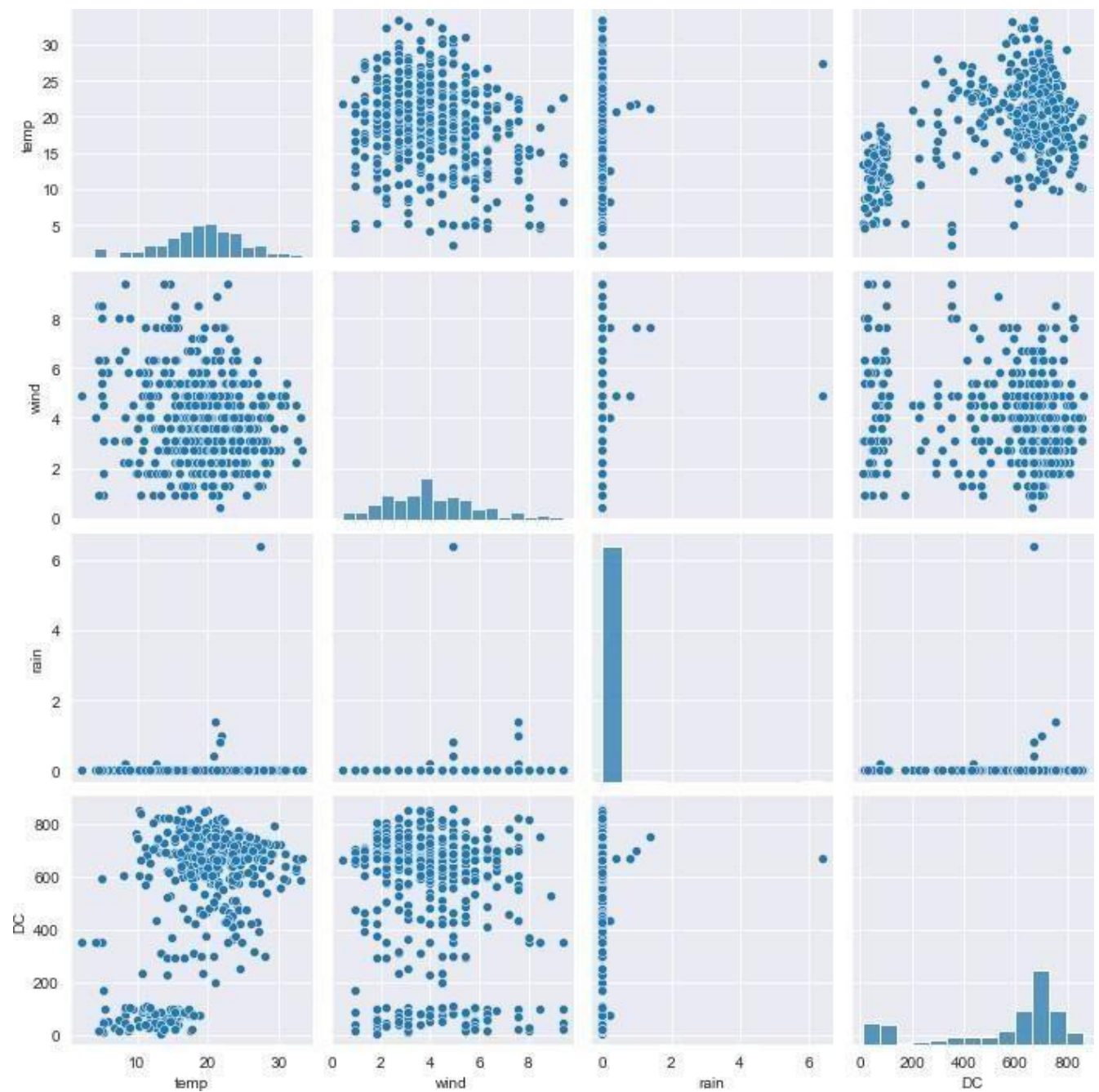
```
In [15]: numerical_feature = fires.describe(include=["int", "float"]).columns

# 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
# plt.subplot(fires)

sns.pairplot(fires[["temp", "wind", "rain", "DC"]])
plt.show()
```

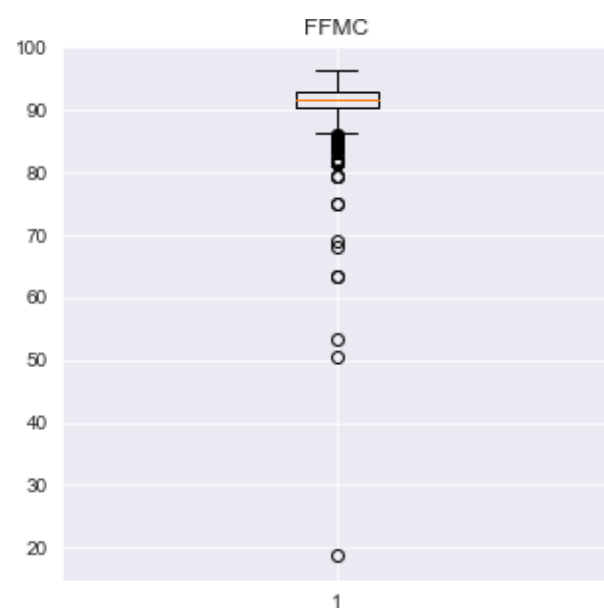
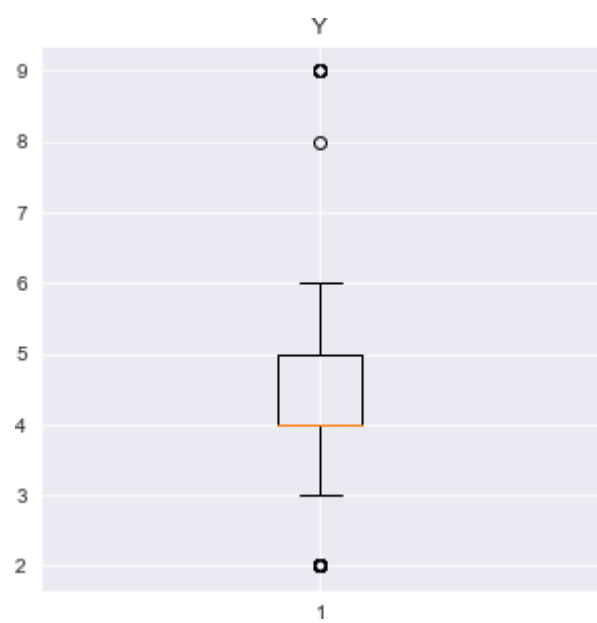


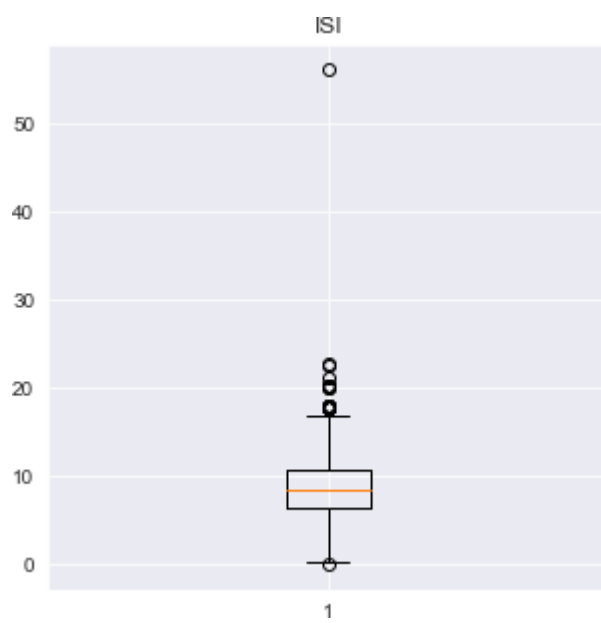
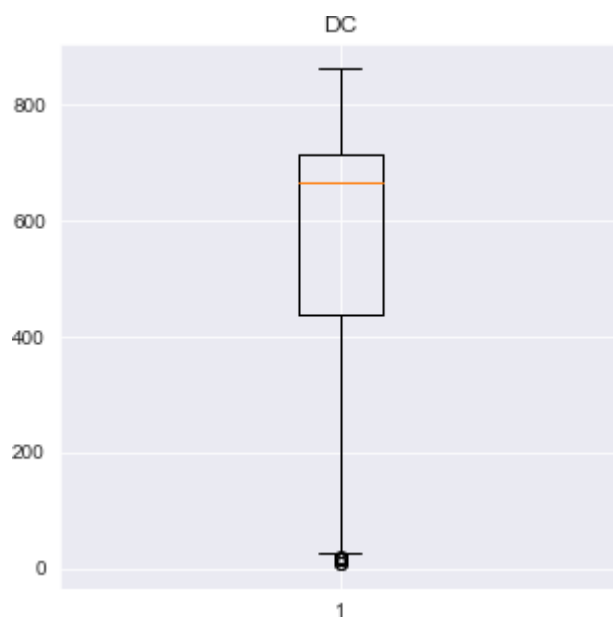
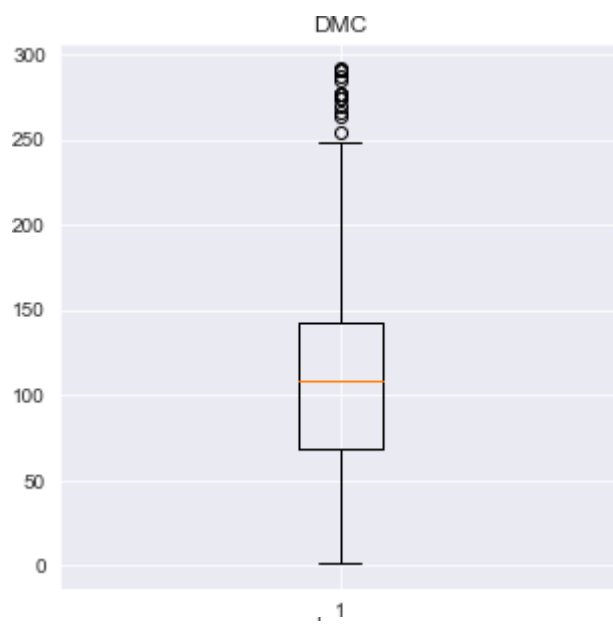
```
In [17]: for idx, col in enumerate(numerical_feature, 1):
plt.figure(figsize=(5,5))

# plt.subplot(len(numerical_feature) // 2, 3, idx)
plt.boxplot(fires[col])

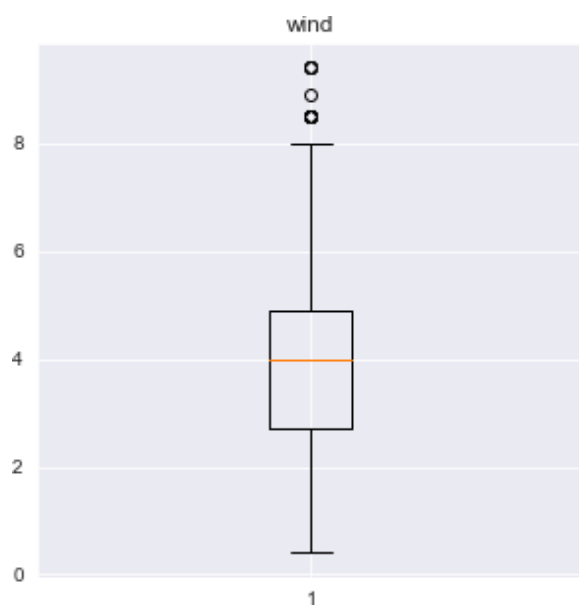
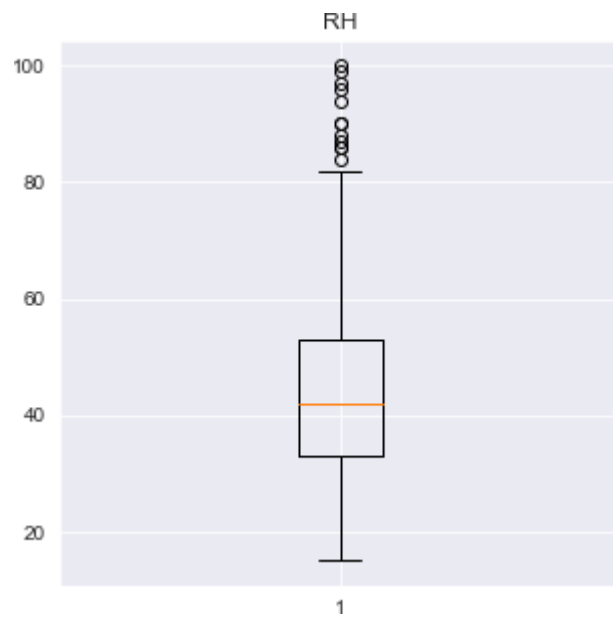
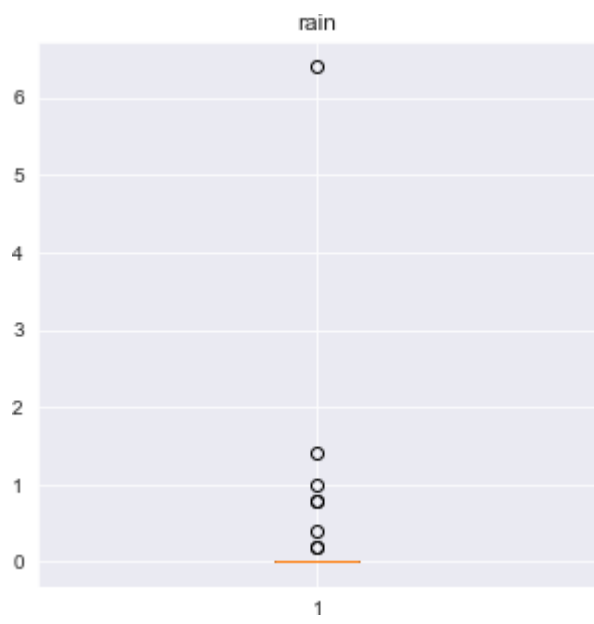
plt.title(col)
# plt.hist(fires[col])

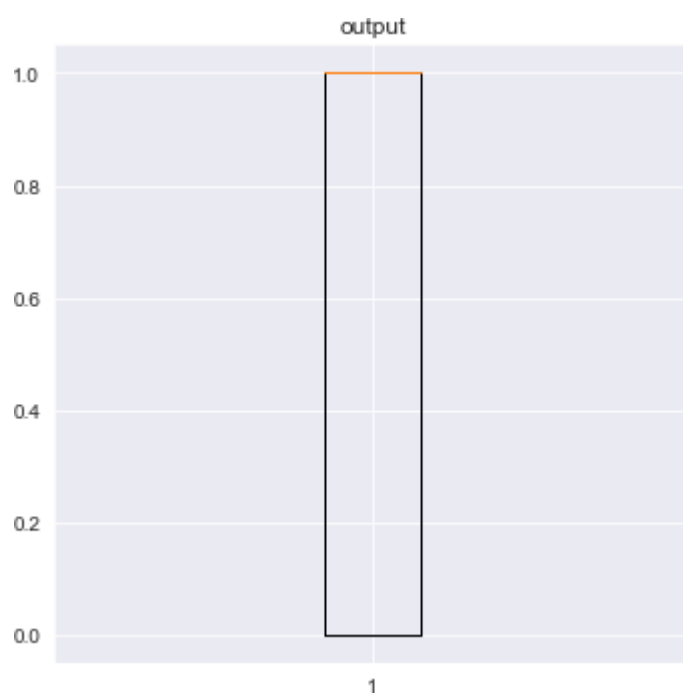
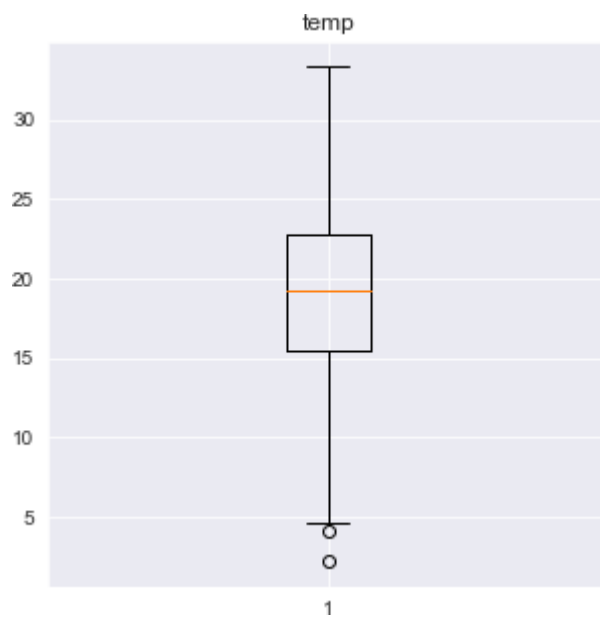
plt.tight_layout()
plt.show(plt)
```



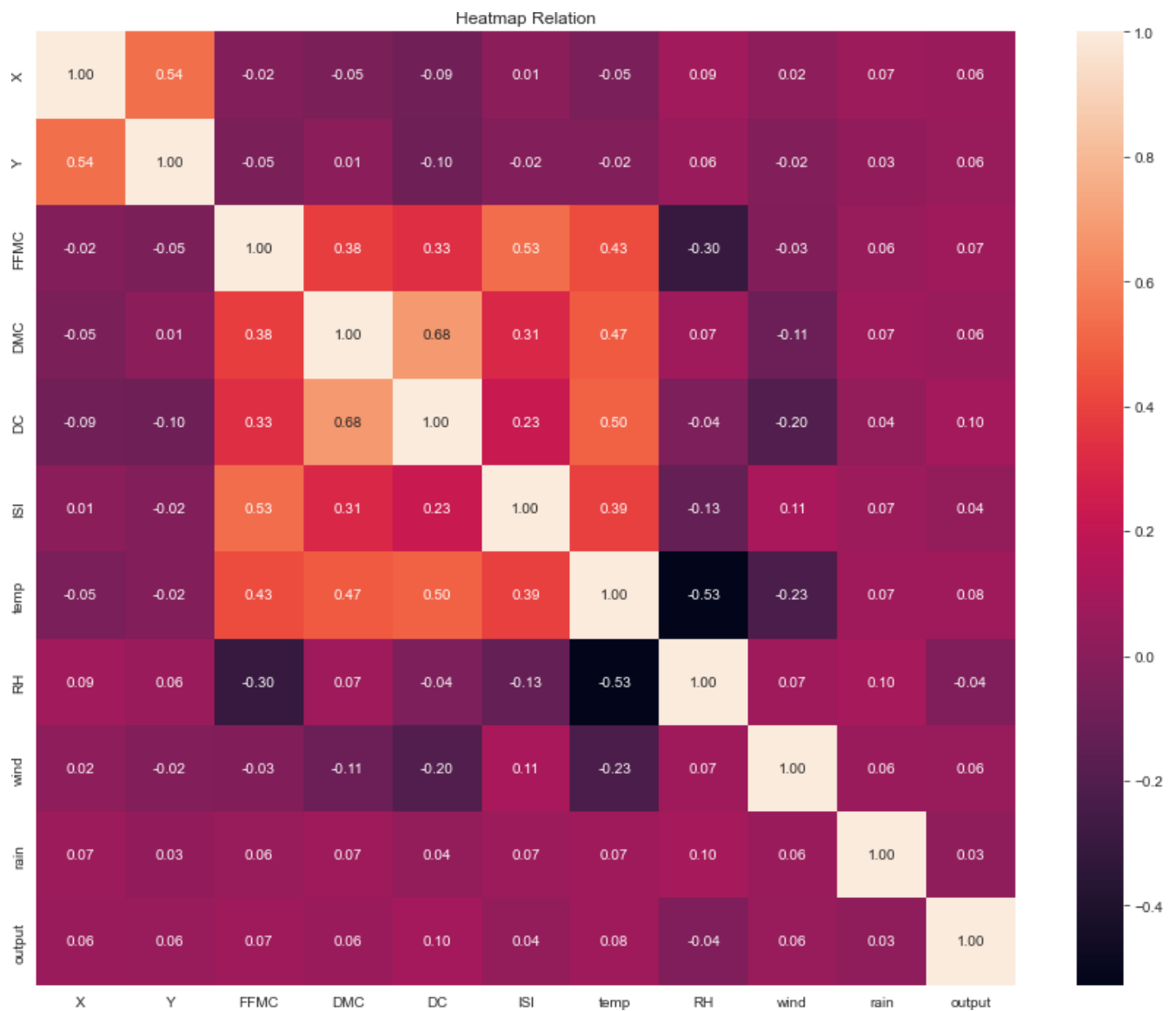








```
In [18]: plt.figure(figsize=(15, 12))  
  
plt.title("Heatmap Relation")  
  
sns.heatmap(fires[numerical_feature].corr(), annot=True, fmt='.2f');
```



```
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

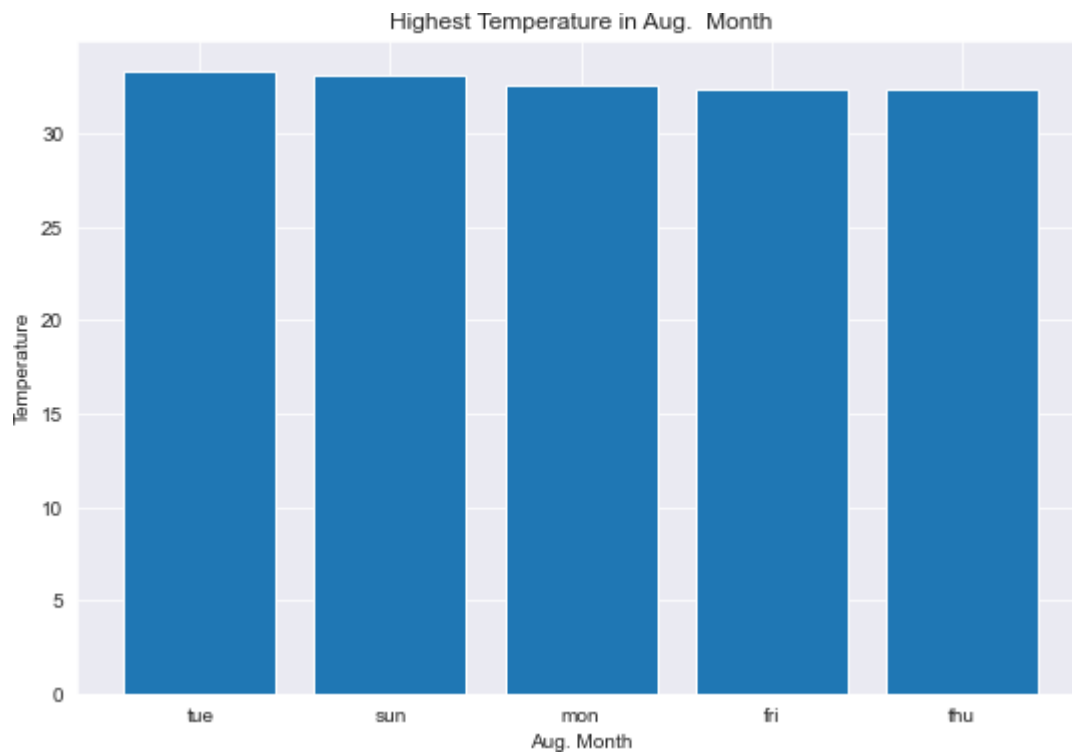
```
In [20]: highest_temp = fires.sort_values(by='temp', ascending=False)[['month', 'day', 'temp']].head()
plt.figure(figsize=(9, 6))

plt.title("Highest Temperature in Aug. Month")

plt.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))

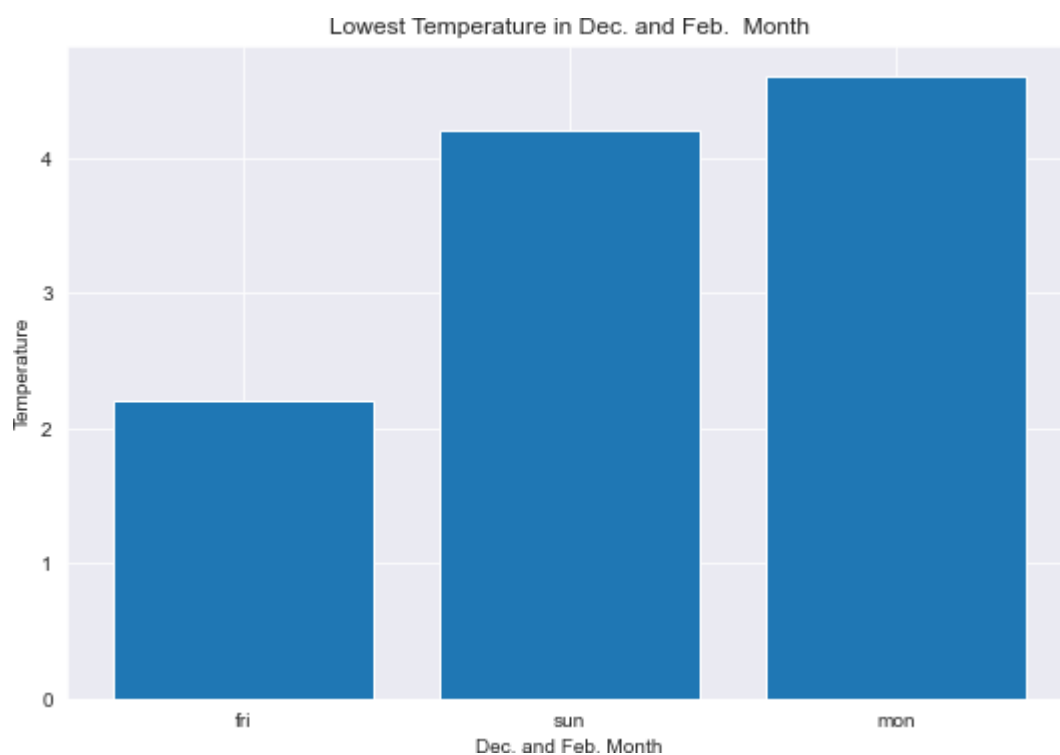
plt.title("Lowest Temperature in Dec. and Feb. Month")

plt.bar(lowest_temp['day'], lowest_temp['temp'])

plt.xlabel("Day")
plt.xlabel("Dec. and Feb. Month")

plt.ylabel("Temperature")

plt.show()
```



```
In [22]: fires
```

Out[22]:	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	output	
	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
	28	6	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
	30	6	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
	32	6	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
	34	6	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	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
93	8	6	aug	sun	91.4	142.4	601.4	10.6	18.2	43	4.9	0.0	0.0
94	8	6	aug	mon	91.1	103.2	638.8	5.8	23.4	22	2.7	0.0	0.0
95	4	4	sep	sun	89.7	90.0	704.4	4.8	17.8	64	1.3	0.0	0.0
96	3	4	feb	sat	83.9	8.0	30.2	2.6	12.7	48	1.8	0.0	0.0
97	3	4	mar	sat	69.0	2.4	15.5	0.7	17.4	24	5.4	0.0	0.0
98	3	4	aug	sun	91.4	142.4	601.4	10.6	11.6	87	4.5	0.0	0.0
99	3	4	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	0.0

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

	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	output
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
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	mar	mon	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	mar	mon	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
222	4	3	mar	mon	87.6	52.2	103.8	5.0	11.0	46	5.8	0.0	1.0
223	2	2	jul	fri	88.3	150.3	309.9	6.8	13.4	79	3.6	0.0	1.0
224	7	4	sep	wed	90.1	82.9	735.7	6.2	15.4	57	4.5	0.0	1.0
225	4	4	sep	sun	93.5	149.3	728.6	8.1	22.9	39	4.9	0.0	1.0
226	7	5	oct	mon	91.7	48.5	696.1	11.1	16.1	44	4.0	0.0	1.0
227	8	6	aug	sat	92.2	81.8	480.8	11.9	20.1	34	4.5	0.0	1.0
228	4	6	sep	sun	93.5	149.3	728.6	8.1	28.3	26	3.1	0.0	1.0
229	8	6	aug	sat	92.2	81.8	480.8	11.9	16.4	43	4.0	0.0	1.0
230	4	4	sep	wed	92.9	133.3	699.6	9.2	26.4	21	4.5	0.0	1.0
231	1	5	sep	sun	93.5	149.3	728.6	8.1	27.8	27	3.1	0.0	1.0
232	6	4	sep	tue	91.0	129.5	692.6	7.0	18.7	43	2.7	0.0	1.0
233	9	4	sep	tue	84.4	73.4	671.9	3.2	24.3	36	3.1	0.0	1.0
234	4	5	sep	sat	92.5	121.1	674.4	8.6	17.7	25	3.1	0.0	1.0
235	8	6	aug	sun	91.4	142.4	601.4	10.6	19.6	41	5.8	0.0	1.0
236	2	2	sep	sat	92.5	121.1	674.4	8.6	18.2	46	1.8	0.0	1.0
237	1	2	sep	tue	91.0	129.5	692.6	7.0	18.8	40	2.2	0.0	1.0
238	6	5	sep	sat	92.5	121.1	674.4	8.6	25.1	27	4.0	0.0	1.0
239	7	5	apr	sun	81.9	3.0	7.9	3.5	13.4	75	1.8	0.0	0.0
240	6	3	apr	wed	88.0	17.2	43.5	3.8	15.2	51	2.7	0.0	0.0
241	4	4	apr	fri	83.0	23.3	85.3	2.3	16.7	20	3.1	0.0	0.0
242	2	4	aug	sun	94.2	122.3	589.9	12.9	15.4	66	4.0	0.0	1.0
243	7	4	aug	sun	91.8	175.1	700.7	13.8	21.9	73	7.6	1.0	0.0
244	2	4	aug	sun	91.8	175.1	700.7	13.8	22.4	54	7.6	0.0	1.0
245	3	4	aug	sun	91.8	175.1	700.7	13.8	26.8	38	6.3	0.0	1.0
246	5	4	aug	sun	91.8	175.1	700.7	13.8	25.7	39	5.4	0.0	1.0
247	2	4	aug	wed	92.2	91.6	503.6	9.6	20.7	70	2.2	0.0	1.0
248	8	6	aug	wed	93.1	157.3	666.7	13.5	28.7	28	2.7	0.0	0.0
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	sat	91.8	170.9	692.3	13.7	20.6	59	0.9	0.0	0.0

	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	output
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
276	4	4	dec	mon	85.4	25.4	349.7	2.6	4.6	21	8.5	0.0	1.0
277	3	4	dec	mon	85.4	25.4	349.7	2.6	4.6	21	8.5	0.0	1.0
278	4	4	dec	mon	85.4	25.4	349.7	2.6	4.6	21	8.5	0.0	1.0
279	4	4	dec	mon	85.4	25.4	349.7	2.6	4.6	21	8.5	0.0	1.0
280	4	6	dec	fri	84.7	26.7	352.6	4.1	2.2	59	4.9	0.0	1.0
281	6	5	dec	tue	85.4	25.4	349.7	2.6	5.1	24	8.5	0.0	1.0
282	6	3	feb	sun	84.9	27.5	353.5	3.4	4.2	51	4.0	0.0	0.0
283	3	4	feb	wed	86.9	6.6	18.7	3.2	8.8	35	3.1	0.0	1.0
284	5	4	feb	fri	85.2	4.9	15.8	6.3	7.5	46	8.0	0.0	1.0
285	2	5	jul	sun	93.9	169.7	411.8	12.3	23.4	40	6.3	0.0	0.0
286	7	6	jul	wed	91.2	183.1	437.7	12.5	12.6	90	7.6	0.2	0.0
287	7	4	jul	sat	91.6	104.2	474.9	9.0	22.1	49	2.7	0.0	0.0
288	7	4	jul	sat	91.6	104.2	474.9	9.0	24.2	32	1.8	0.0	0.0
289	7	4	jul	sat	91.6	104.2	474.9	9.0	24.3	30	1.8	0.0	0.0
290	2	5	jul	sat	91.6	104.2	474.9	9.0	18.7	53	1.8	0.0	0.0
291	9	4	jul	sat	91.6	104.2	474.9	9.0	25.3	39	0.9	0.0	1.0
292	4	5	jul	fri	91.6	100.2	466.3	6.3	22.9	40	1.3	0.0	1.0
293	7	6	jul	tue	93.1	180.4	430.8	11.0	26.9	28	5.4	0.0	1.0
294	8	6	jul	tue	92.3	88.8	440.9	8.5	17.1	67	3.6	0.0	1.0
295	7	5	jun	sun	93.1	180.4	430.8	11.0	22.2	48	1.3	0.0	0.0

	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	output
296	6	4	jun	sun	90.4	89.5	290.8	6.4	14.3	46	1.8	0.0	1.0
297	8	6	jun	sun	90.4	89.5	290.8	6.4	15.4	45	2.2	0.0	0.0
298	8	6	jun	wed	91.2	147.8	377.2	12.7	19.6	43	4.9	0.0	0.0
299	6	5	jun	sat	53.4	71.0	233.8	0.4	10.6	90	2.7	0.0	0.0
300	6	5	jun	mon	90.4	93.3	298.1	7.5	20.7	25	4.9	0.0	0.0
301	6	5	jun	mon	90.4	93.3	298.1	7.5	19.1	39	5.4	0.0	1.0
302	3	6	jun	fri	91.1	94.1	232.1	7.1	19.2	38	4.5	0.0	0.0
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
330	3	3	sep	sat	92.2	102.3	751.5	8.4	24.2	27	3.1	0.0	1.0
331	7	4	sep	sat	91.2	124.4	795.3	8.5	21.5	28	4.5	0.0	1.0
332	4	4	sep	sat	91.2	124.4	795.3	8.5	17.1	41	2.2	0.0	1.0

	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	output
333	1	4	sep	mon	92.1	87.7	721.1	9.5	18.1	54	3.1	0.0	1.0
334	2	3	sep	mon	91.6	108.4	764.0	6.2	18.0	51	5.4	0.0	0.0
335	4	3	sep	mon	91.6	108.4	764.0	6.2	9.8	86	1.8	0.0	0.0
336	7	4	sep	mon	91.6	108.4	764.0	6.2	19.3	44	2.2	0.0	0.0
337	6	3	sep	mon	91.6	108.4	764.0	6.2	23.0	34	2.2	0.0	1.0
338	8	6	sep	mon	91.6	108.4	764.0	6.2	22.7	35	2.2	0.0	1.0
339	2	4	sep	mon	91.6	108.4	764.0	6.2	20.4	41	1.8	0.0	1.0
340	2	5	sep	mon	91.6	108.4	764.0	6.2	19.3	44	2.2	0.0	1.0
341	8	6	sep	mon	91.9	111.7	770.3	6.5	15.7	51	2.2	0.0	0.0
342	6	3	sep	mon	91.5	130.1	807.1	7.5	20.6	37	1.8	0.0	0.0
343	8	6	sep	mon	91.5	130.1	807.1	7.5	15.9	51	4.5	0.0	1.0
344	6	3	sep	mon	91.5	130.1	807.1	7.5	12.2	66	4.9	0.0	1.0
345	2	2	sep	mon	91.5	130.1	807.1	7.5	16.8	43	3.1	0.0	1.0
346	1	4	sep	mon	91.5	130.1	807.1	7.5	21.3	35	2.2	0.0	1.0
347	5	4	sep	fri	92.1	99.0	745.3	9.6	10.1	75	3.6	0.0	0.0
348	3	4	sep	fri	92.1	99.0	745.3	9.6	17.4	57	4.5	0.0	0.0
349	5	4	sep	fri	92.1	99.0	745.3	9.6	12.8	64	3.6	0.0	1.0
350	5	4	sep	fri	92.1	99.0	745.3	9.6	10.1	75	3.6	0.0	1.0
351	4	4	sep	fri	92.1	99.0	745.3	9.6	15.4	53	6.3	0.0	1.0
352	7	4	sep	fri	92.1	99.0	745.3	9.6	20.6	43	3.6	0.0	1.0
353	7	4	sep	fri	92.1	99.0	745.3	9.6	19.8	47	2.7	0.0	1.0
354	7	4	sep	fri	92.1	99.0	745.3	9.6	18.7	50	2.2	0.0	1.0
355	4	4	sep	fri	92.1	99.0	745.3	9.6	20.8	35	4.9	0.0	1.0
356	4	4	sep	fri	92.1	99.0	745.3	9.6	20.8	35	4.9	0.0	1.0
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

	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	input	output
370	7	4	sep	sun	91.0	276.3	825.1	7.1	13.8	77	7.6	0.0	1.0	
371	3	4	jul	wed	91.9	133.6	520.5	8.0	14.2	58	4.0	0.0	0.0	
372	4	5	aug	sun	92.0	203.2	664.5	8.1	10.4	75	0.9	0.0	0.0	
373	5	4	aug	thu	94.8	222.4	698.6	13.9	20.3	42	2.7	0.0	0.0	
374	6	5	sep	fri	90.3	290.0	855.3	7.4	10.3	78	4.0	0.0	1.0	
375	6	5	sep	sat	91.2	94.3	744.4	8.4	15.4	57	4.9	0.0	1.0	
376	8	6	aug	mon	92.1	207.0	672.6	8.2	21.1	54	2.2	0.0	0.0	
377	2	2	aug	sat	93.7	231.1	715.1	8.4	21.9	42	2.2	0.0	1.0	
378	6	5	mar	thu	90.9	18.9	30.6	8.0	8.7	51	5.8	0.0	0.0	
379	4	5	jan	sun	18.7	1.1	171.4	0.0	5.2	100	0.9	0.0	0.0	
380	5	4	jul	wed	93.7	101.3	458.8	11.9	19.3	39	7.2	0.0	1.0	
381	8	6	aug	thu	90.7	194.1	643.0	6.8	16.2	63	2.7	0.0	1.0	
382	8	6	aug	wed	95.2	217.7	690.0	18.0	28.2	29	1.8	0.0	1.0	
383	9	6	aug	thu	91.6	248.4	753.8	6.3	20.5	58	2.7	0.0	1.0	
384	8	4	aug	sat	91.6	273.8	819.1	7.7	21.3	44	4.5	0.0	1.0	
385	2	4	aug	sun	91.6	181.3	613.0	7.6	20.9	50	2.2	0.0	1.0	
386	3	4	sep	sun	90.5	96.7	750.5	11.4	20.6	55	5.4	0.0	1.0	
387	5	5	mar	thu	90.9	18.9	30.6	8.0	11.6	48	5.4	0.0	0.0	
388	6	4	aug	fri	94.8	227.0	706.7	12.0	23.3	34	3.1	0.0	1.0	
389	7	4	aug	fri	94.8	227.0	706.7	12.0	23.3	34	3.1	0.0	0.0	
390	7	4	feb	mon	84.7	9.5	58.3	4.1	7.5	71	6.3	0.0	1.0	
391	8	6	sep	fri	91.1	91.3	738.1	7.2	20.7	46	2.7	0.0	1.0	
392	1	3	sep	sun	91.0	276.3	825.1	7.1	21.9	43	4.0	0.0	1.0	
393	2	4	mar	tue	93.4	15.0	25.6	11.4	15.2	19	7.6	0.0	0.0	
394	6	5	feb	mon	84.1	4.6	46.7	2.2	5.3	68	1.8	0.0	0.0	
395	4	5	feb	sun	85.0	9.0	56.9	3.5	10.1	62	1.8	0.0	1.0	
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	sat	87.1	291.3	860.6	4.0	17.0	67	4.9	0.0	1.0	

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	wind	rain	input	output
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	
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	9	9	jul	thu	93.2	114.4	560.0	9.5	30.2	25	4.5	0.0	1.0	

	X	Y	month	day	FFMC	DMC	DC	ISI	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	6	3	nov	tue	79.5	3.0	106.7	1.1	11.8	31	4.5	0.0	0.0

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

```
In [2]: #Define the parameters/arguments for ImageDataGenerator class
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
from keras.layers import Convolution2D
#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
model.add(Dense(150,activation='relu')) #add output
layer model.add(Dense(1,activation='sigmoid'))
```

```
In [10]: #configure the learning process  
model.compile(loss='binary_crossentropy',optimizer="adam",metrics=["accuracy"])
```

```
In [11]: #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 [=====] - 84s 6s/step - loss: 4.2334 - accuracy: 0.5619 - val\_  
 loss: 1.3686 - val\_accuracy: 0.5950 Epoch 2/10  
 14/14 [=====] - 74s 5s/step - loss: 0.5689 - accuracy: 0.7362 - val\_  
 loss: 0.2423 - val\_accuracy: 0.8926 Epoch 3/10  
 14/14 [=====] - 123s 9s/step - loss: 0.2231 - accuracy: 0.9197 - val\_  
 \_loss: 0.1323 - val\_accuracy: 0.9669 Epoch 4/10  
 14/14 [=====] - 75s 5s/step - loss: 0.2170 - accuracy: 0.9128 - val\_  
 loss: 0.1082 - val\_accuracy: 0.9669 Epoch 5/10  
 14/14 [=====] - 129s 10s/step - loss: 0.1918 - accuracy: 0.9151 - va  
 l\_loss: 0.1145 - val\_accuracy: 0.9669 Epoch 6/10  
 14/14 [=====] - 111s 8s/step - loss: 0.1938 - accuracy: 0.9037 - val\_  
 \_loss: 0.1030 - val\_accuracy: 0.9669

Epoch	7/10				
14/14 [=====]	- 88s 6s/step	- loss: 0.1756	- accuracy: 0.9312	- val_	
	=====]				
loss: 0.0831 - val_accuracy: 0.9752	8/10				
Epoch					
14/14 [=====]	- 86s 6s/step	- loss: 0.1564	- accuracy: 0.9404	- val_	
	=====]				
loss: 0.1073 - val_accuracy: 0.9669	9/10				
Epoch					
14/14 [=====]	- 77s 6s/step	- loss: 0.1480	- accuracy: 0.9427	- val_	
	=====]				
loss: 0.0754 - val_accuracy: 0.9835	10/10				
Epoch [=====]					
14/14 [=====]	- 81s 6s/step	- loss: 0.1641	- accuracy: 0.9289	- val_	
	=====]				
loss: 0.0601 - val_accuracy: 0.9835					

Out[11]: <keras.callbacks.History at 0x2546507bf10>

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

In [13]: `#import load_model from keras.modelfrom  
 keras.models import load_model #import  
 image class from keras  
 from tensorflow.keras.preprocessing import image  
 #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')  
 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

