EMERGING METHODS FOR EARLY DETECTION OF FOREST FIRES

PROJECT DEVELOPMENT PHASE

SPRINT 3

```
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

	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	area
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]:
```python
fires.shape
```

(517, 13)

Out[7]:

In [8]:
```python
#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
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	18.7	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
#renaming the area attribute to output for clear understanding
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]:

	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

```python
fires.corr()
```

	X	Y	FFMC	DMC	DC	ISI	temp	RH	wind	rain
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	0.055702	0.025

```python
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']
```

```python
sns.set_style('darkgrid')
# Find the relation #
plt.subplot(fires)
 sns.pairplot(fires[["temp", "wind",
"rain","DC"]]) plt.show()
```
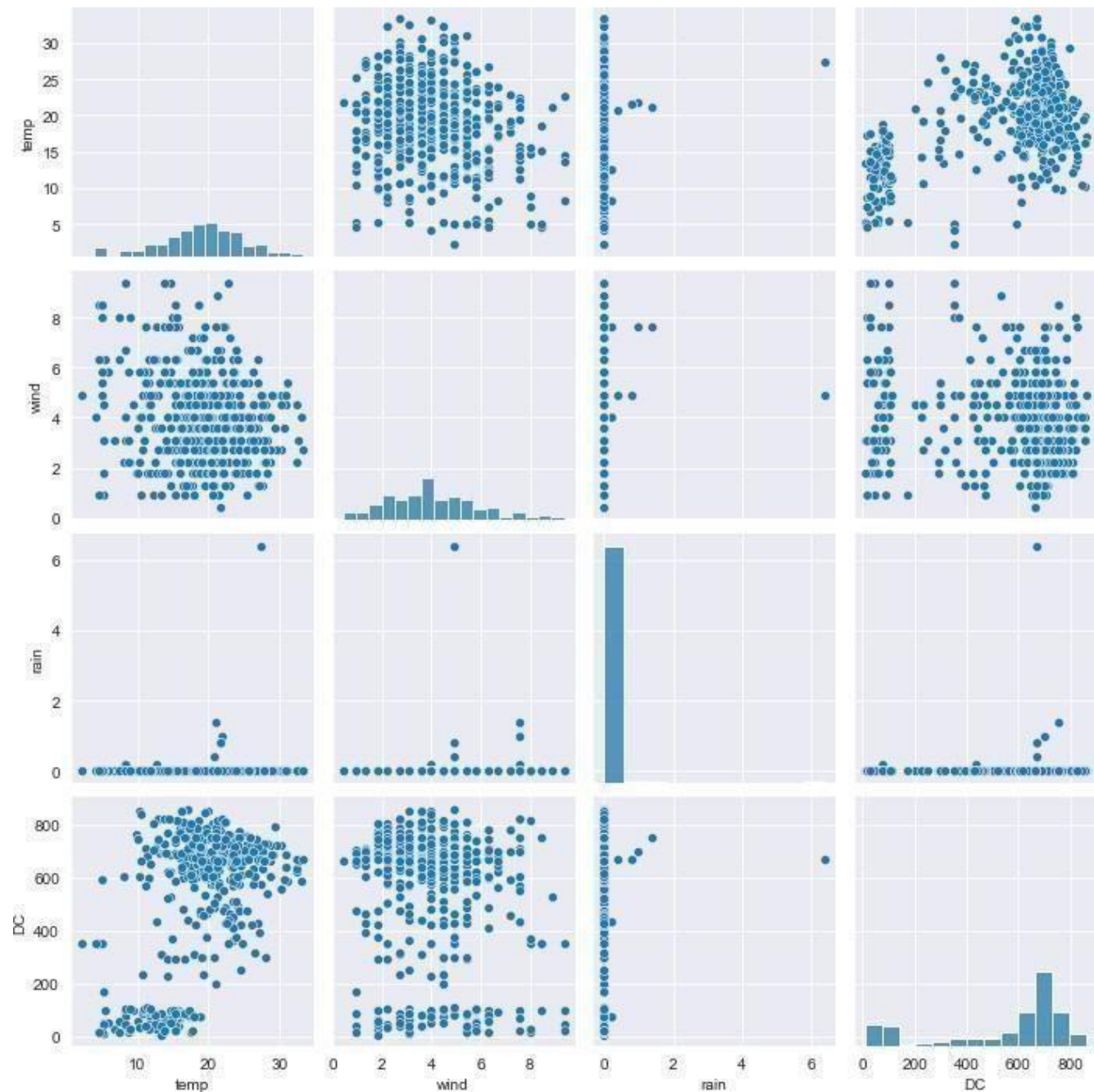
In [17]:
```python
for idx, col in enumerate(numerical_feature, 1):
    plt.figure(figsize=(5,5))
    # plt.subplot(len(numerical_feature) // 2, 3, idx) plt.boxplot(fires[col])
plt.title(col)
#       plt.hist(fires[col])
 plt.tight_layout()
plt.show(plt)
```

DC

ISI

rain

RH

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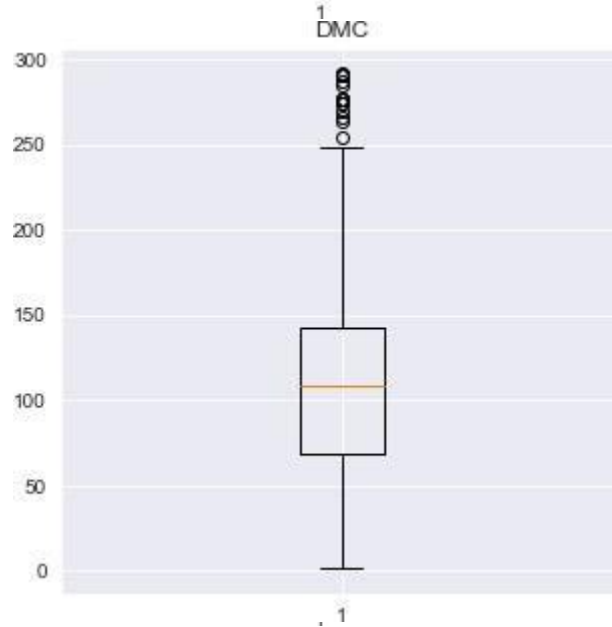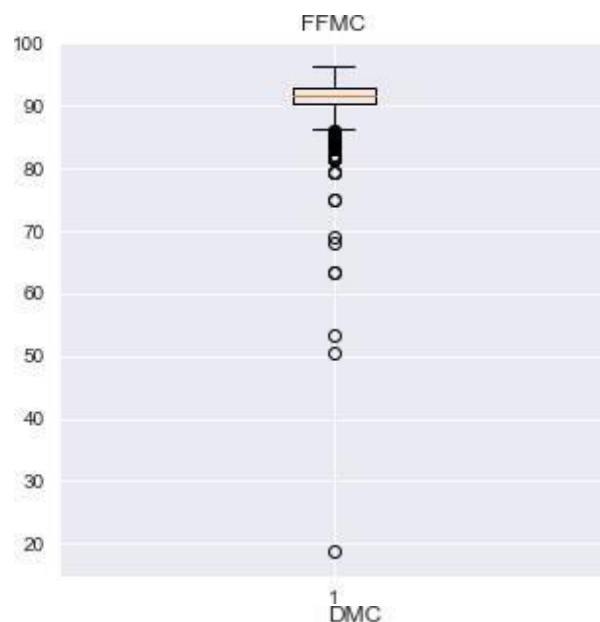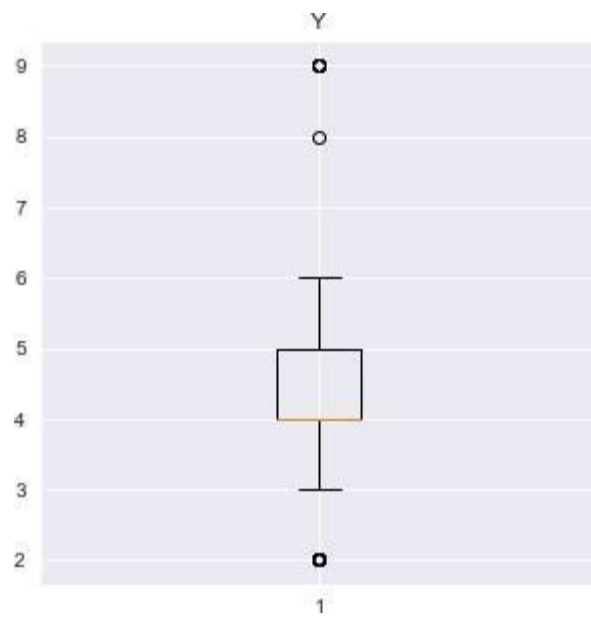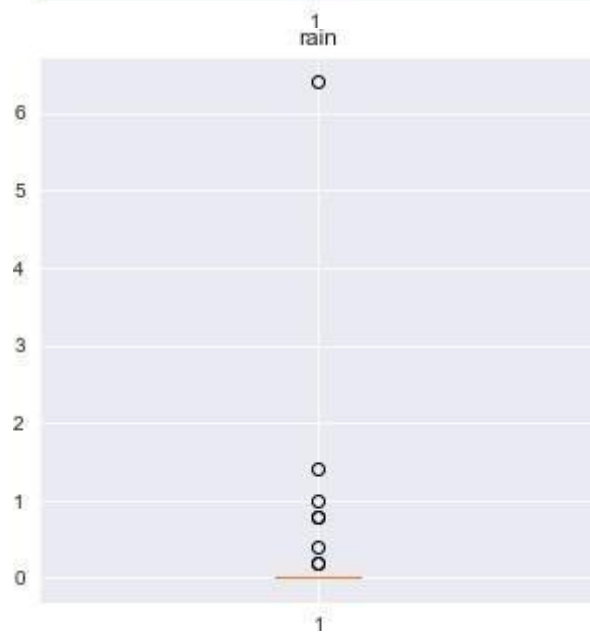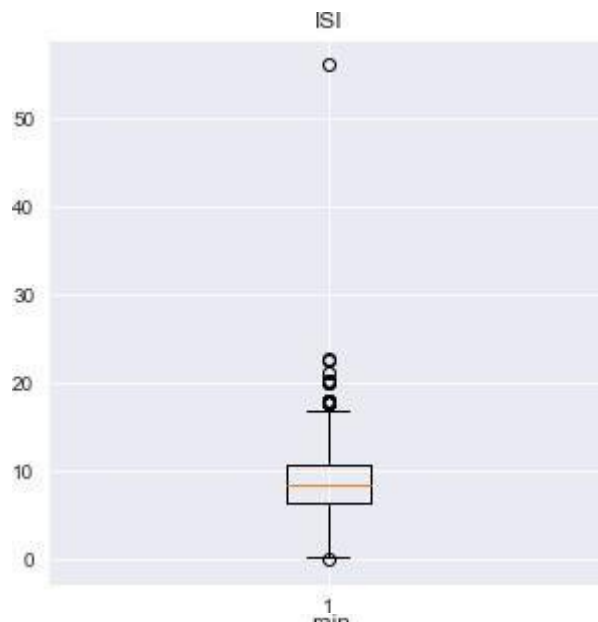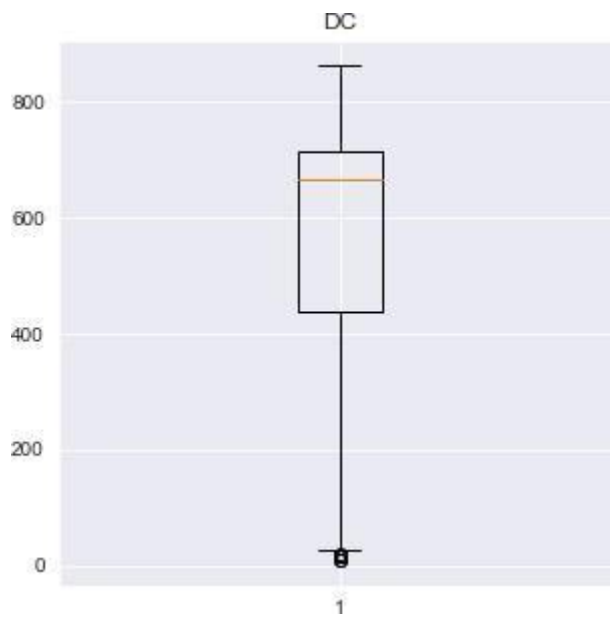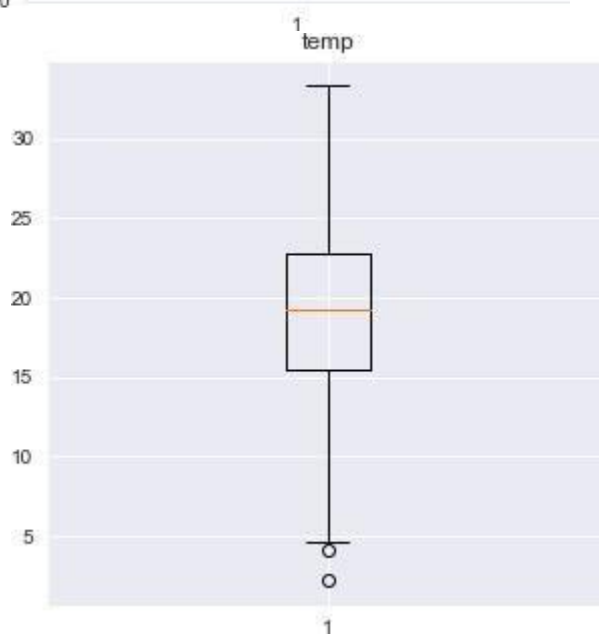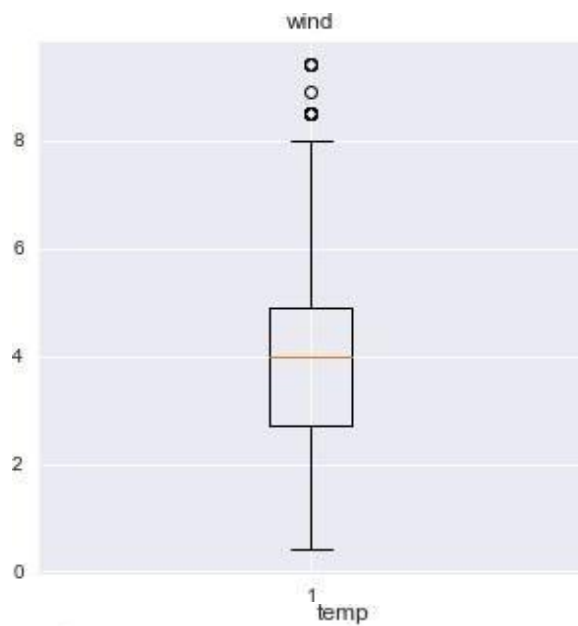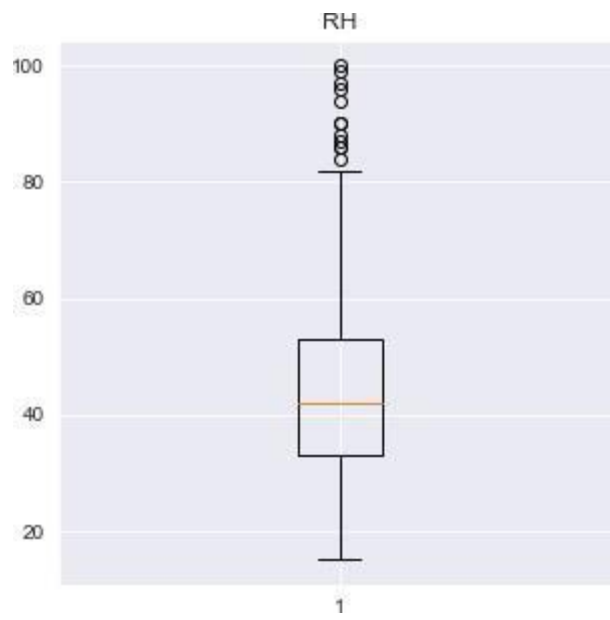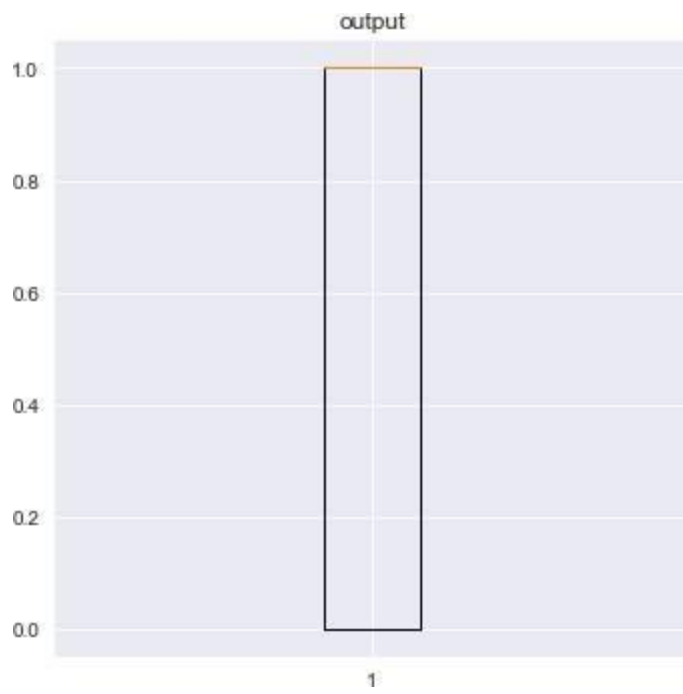
```python
plt.figure(figsize=(15,    12))  plt.title("Heatmap   Relation")
sns.heatmap(fires[numerical_feature].corr(), annot=True, fmt='.2f');
```

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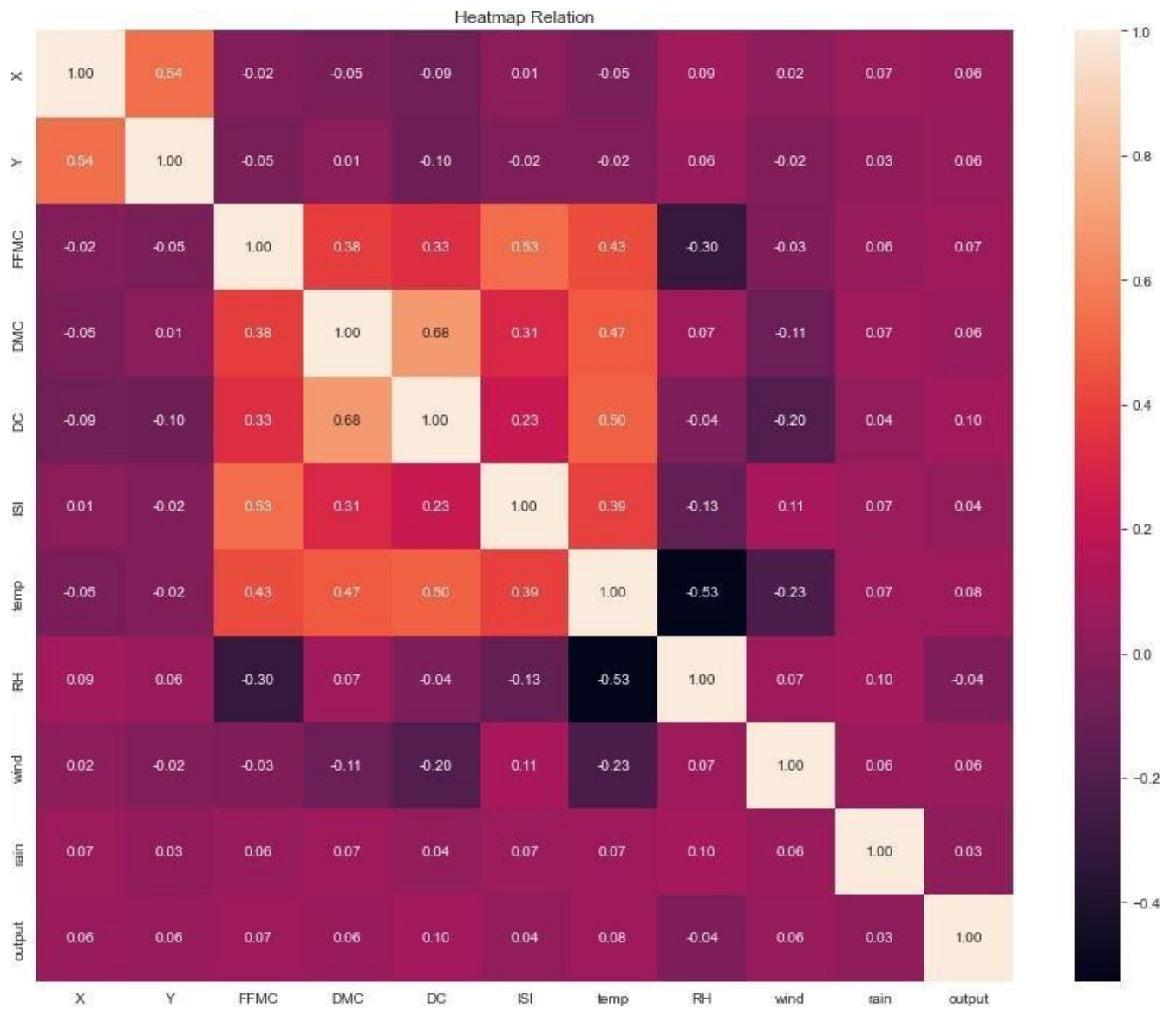
```
In [19]:   highest_rain                      = fires.sort_values(by='rain', ascending=False)[['month', 'day',
          'rain']].head()
          highest_rain
```

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()
```
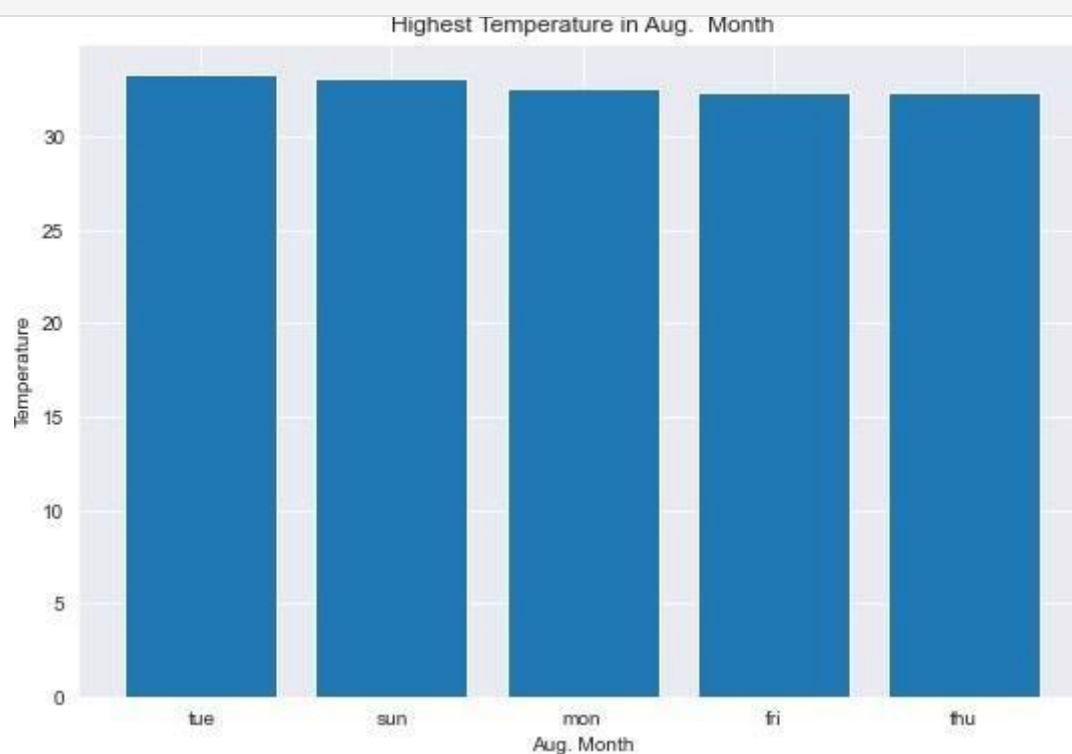
```
In [21]:  lowest_temp = fires.sort_values(by='temp', ascending=True)[['month', 'day', 'temp']].head()
          plt.figure(figsize=(9, 6))
           plt.title("Lowest Temperature in Dec. and Feb. Month")

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

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


Lowest Temperature in Dec. and Feb. Month

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

	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

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

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

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

0.0

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

	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

	X	Y	month	day	FFMC	DMC	DC	ISI	temp				
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
	X	Y	month	day	FFMC	DMC	DC	ISI	temp				
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

0.0

idx													
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		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   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

0.0

	X	Y	month	day	FFMC	DMC	DC	ISI	temp				
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
				sat								0.0	

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

	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	output
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
				sat								0.0	

	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	output
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
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
													1.0
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

	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	output
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		91.2	124.4	795.3	8.5	17.1	41	2.2		
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
				sat								0.0	

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

	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	output
													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
				sat									0.0

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

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
			sat									
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		87.1	291.3	860.6	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
												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

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

1.0

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

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

1.0

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 [ ]:

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

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

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

```python
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.

```python
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.

```python
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')
```

```python
In [7]:

         #initializing the model model=Sequential()
```

```python
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())
```

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

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

```python
#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: 0.5950Epoch 2/10
14/14 [==============================] - 74s 5s/step - loss: 0.5689 - accuracy: 0.7362 - val_ loss:
0.2423 - val_accuracy: 0.8926Epoch 3/10
14/14 [==============================] - 123s 9s/step - loss: 0.2231 - accuracy: 0.9197 - val _loss:
0.1323 - val_accuracy: 0.9669Epoch 4/10
14/14 [==============================] - 75s 5s/step - loss: 0.2170 - accuracy: 0.9128 - val_ loss:
0.1082 - val_accuracy: 0.9669Epoch 5/10
14/14 [==============================] - 129s 10s/step - loss: 0.1918 - accuracy: 0.9151 - va l_loss:
0.1145 - val_accuracy: 0.9669Epoch 6/10
14/14 [==============================] - 111s 8s/step - loss: 0.1938 - accuracy: 0.9037 - val _loss: 0.1030
- val_accuracy: 0.9669
```

```
Epoch14/14  [=========================7/10                                           ====]
- 88s 6s/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 [=========================
====] - 77s 6s/step - loss: 0.1480 - accuracy: 0.9427 - val_  loss: 0.0754 - val_accuracy: 0.983510/10        Epoch

[=========================
                                        ====]
    14/14    - 81s 6s/step      - loss:   0.1641  - accuracy: 0.9289        - val_    loss:      0.0601 - val_accuracy: 0.9835
```

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

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

In [13]:
```python
#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=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
```