

EMERGING METHODS FOR EARLY DETECTION OF FOREST FIRES

PROJECT DEVELOPMENT PHASE

SPRINT 1

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Team ID	PNT2022TMID33633
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 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
	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
	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]: 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	
	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

```

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

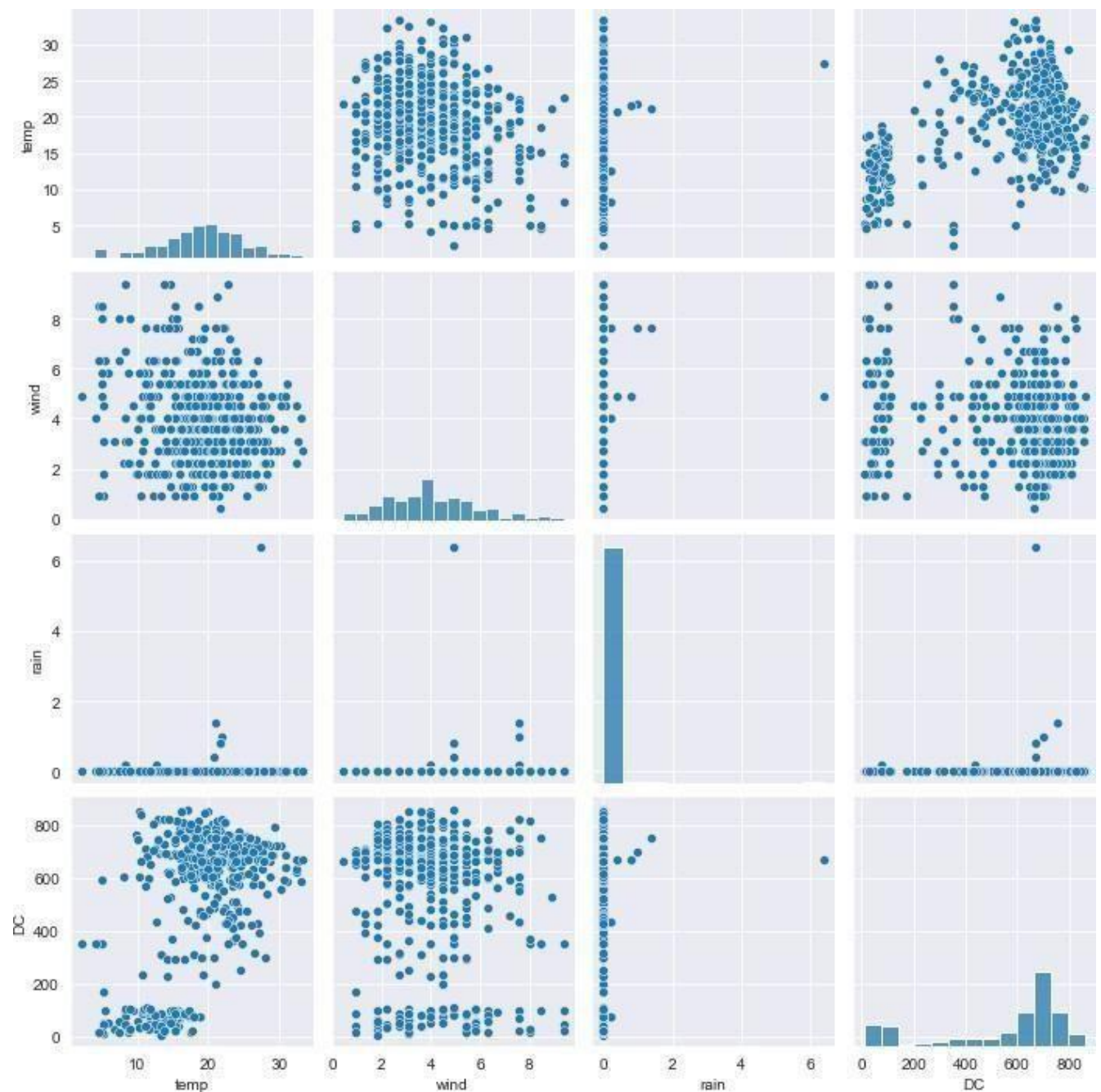
# Print it in list type ..
print(list(numerical_feature))

['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()

```

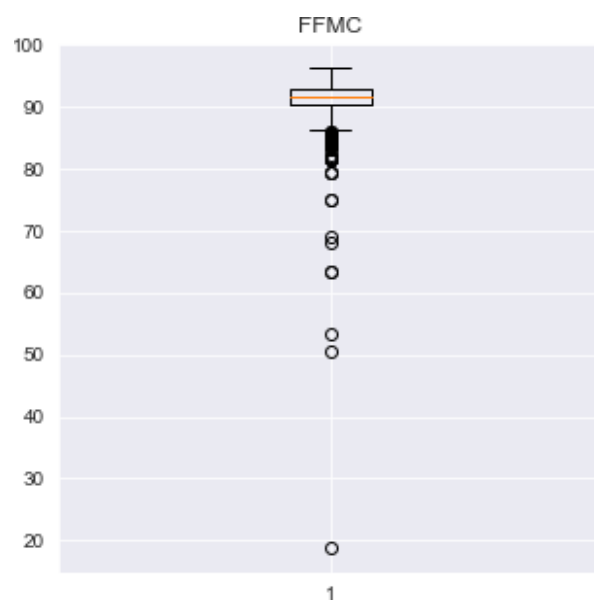
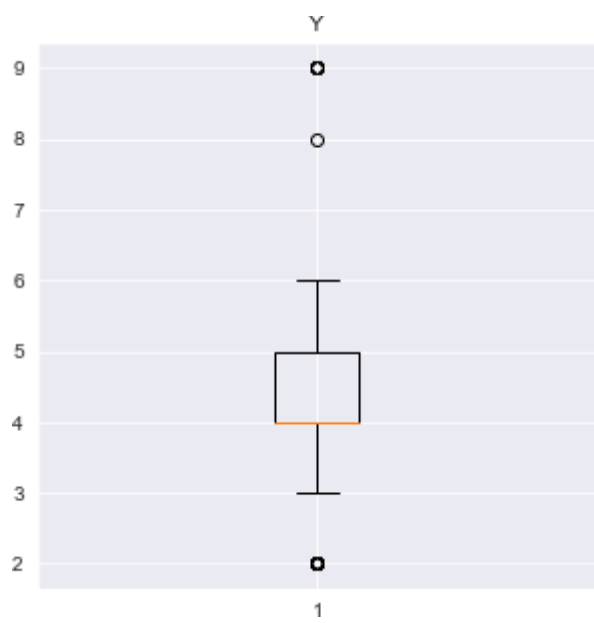


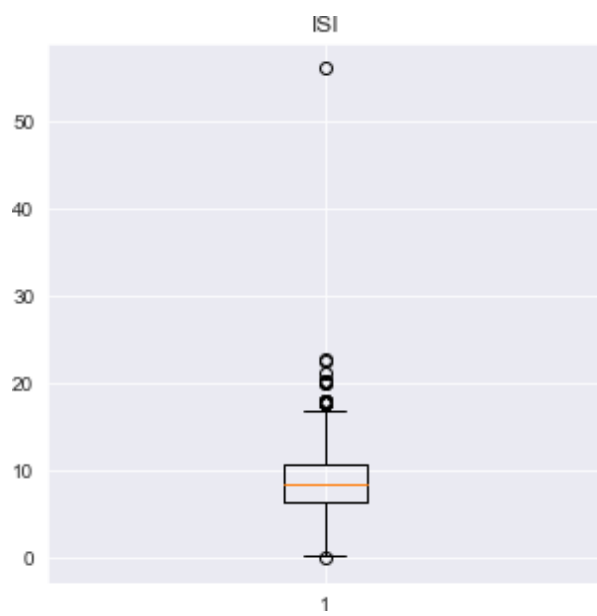
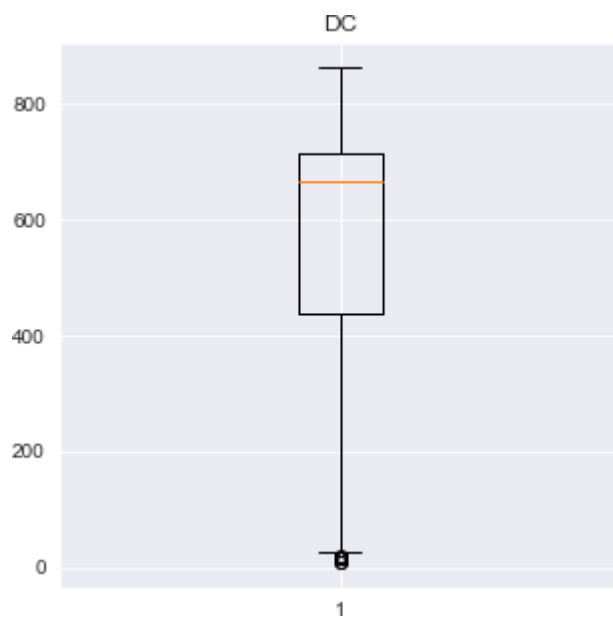
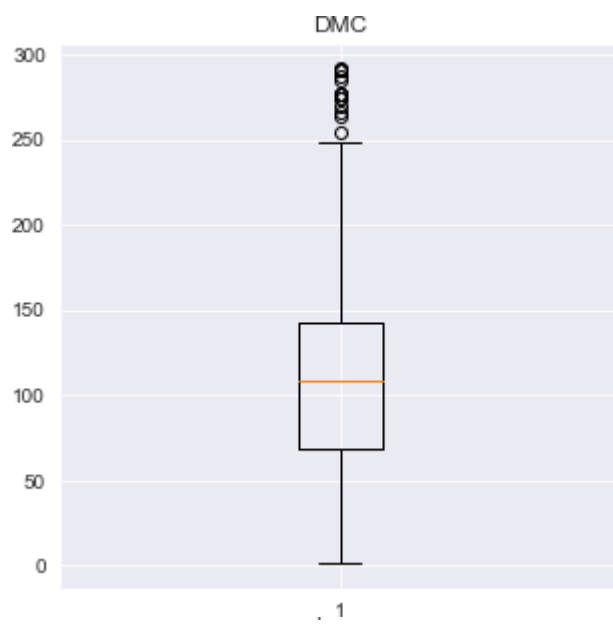
```
In [17]: for idx, col in enumerate(numerical_feature, 1):
plt.figure(figsize=(5,5))

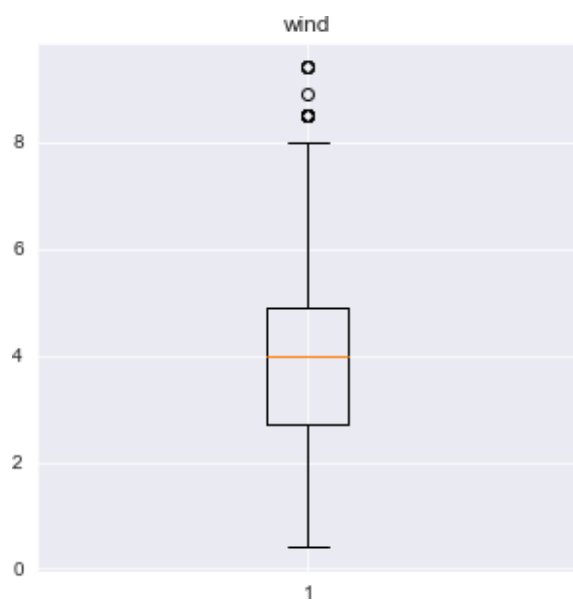
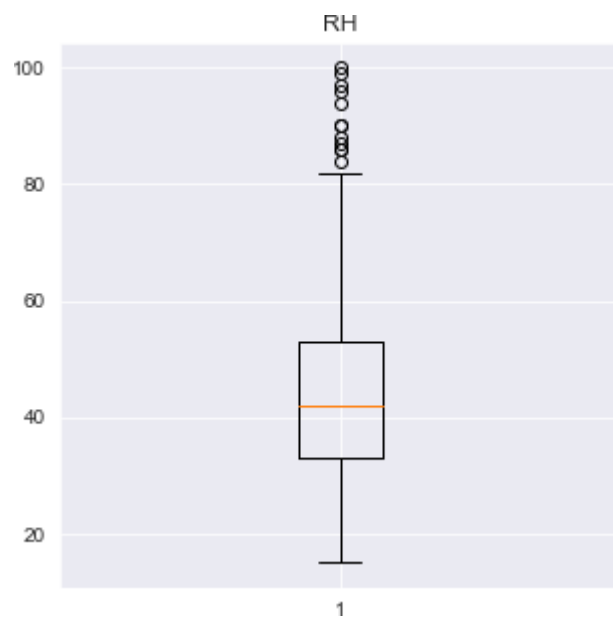
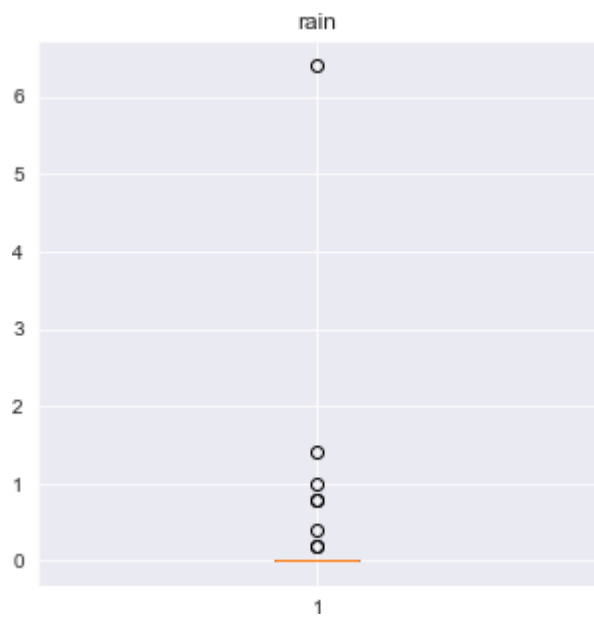
# plt.subplot(len(numerical_feature) // 2, 3, idx)
plt.boxplot(fires[col])

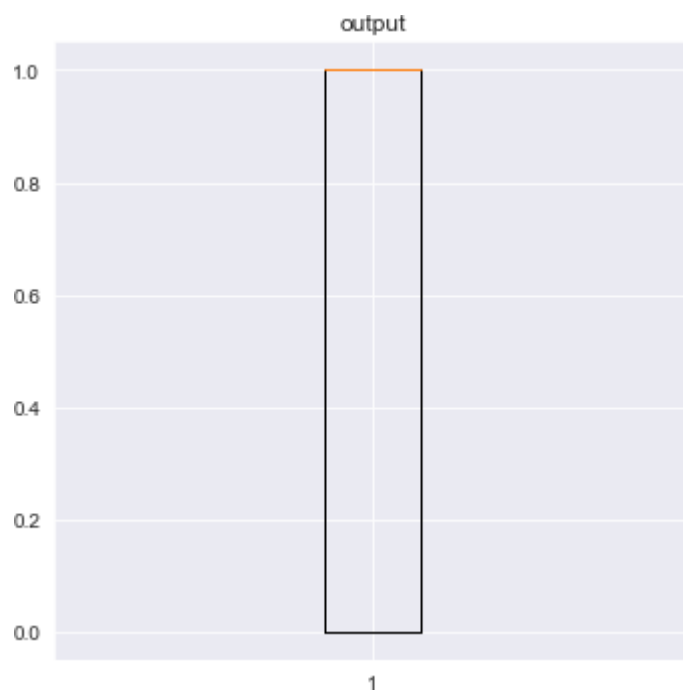
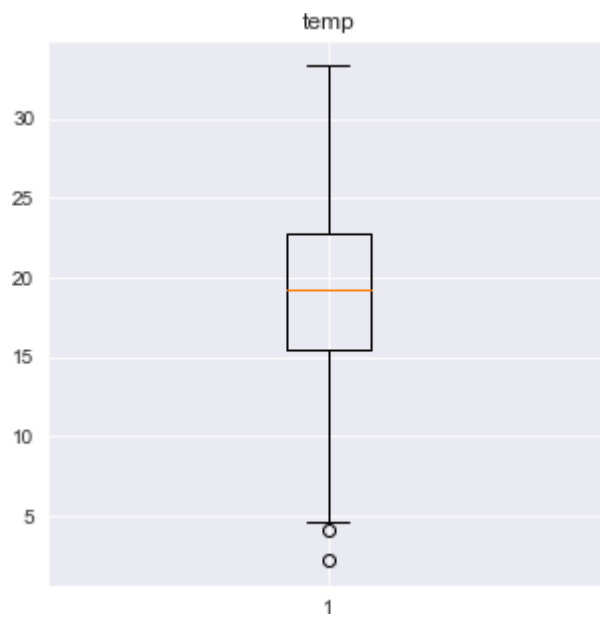
plt.title(col)
# plt.hist(fires[col])

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

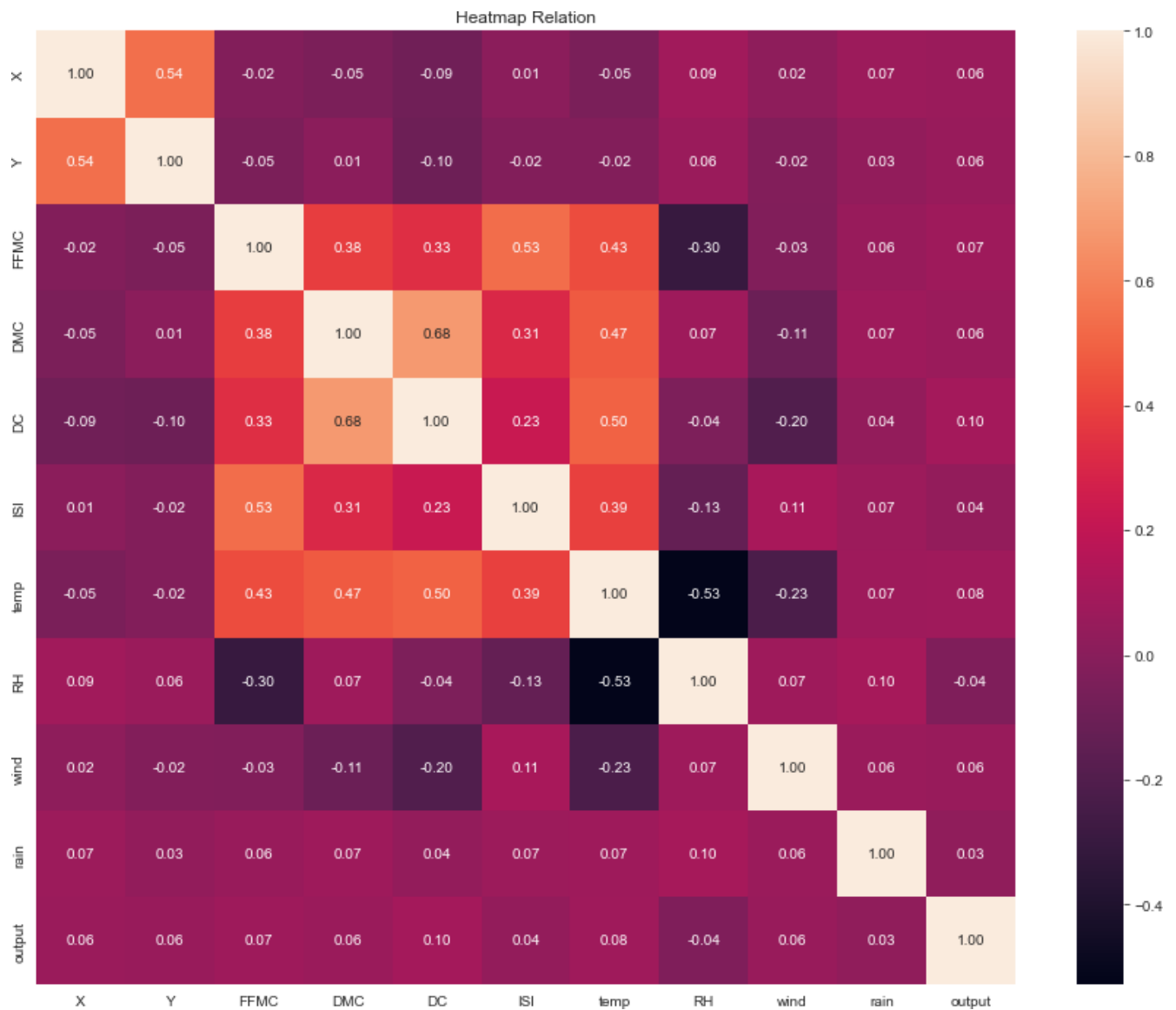








```
In [18]: plt.figure(figsize=(15, 12))  
  
plt.title("Heatmap Relation")  
  
sns.heatmap(fires[numerical_feature].corr(), annot=True, fmt='.2f');
```



```
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

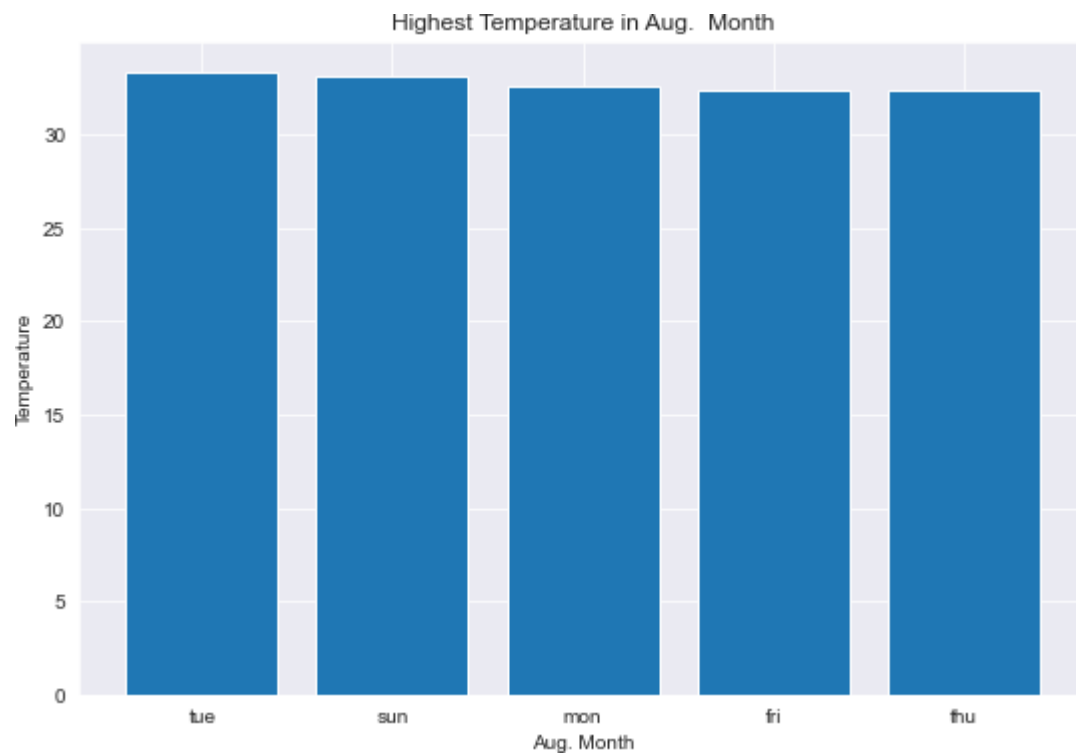
```
In [20]: highest_temp = fires.sort_values(by='temp', ascending=False)[['month', 'day', 'temp']].head()
plt.figure(figsize=(9, 6))

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))

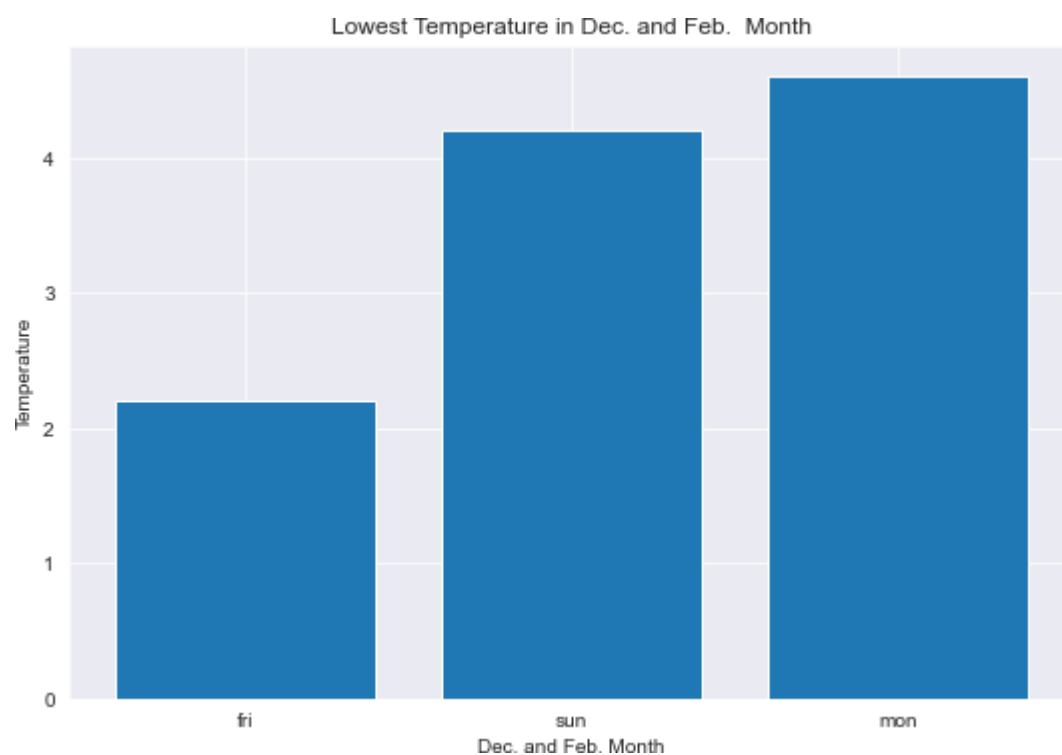
plt.title("Lowest Temperature in Dec. and Feb. Month")

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
	38	7	3	oct	sat	90.6	43.7	686.9	6.7	17.8	27	4.0	0.0
	39	4	4	mar	tue	88.1	25.7	67.6	3.8	14.1	43	2.7	0.0
	40	4	4	jul	tue	79.5	60.6	366.7	1.5	23.3	37	3.1	0.0
	41	4	4	aug	sat	90.2	96.9	624.2	8.9	18.4	42	6.7	0.0
	42	4	4	aug	tue	94.8	108.3	647.1	17.0	16.6	54	5.4	0.0
	43	4	4	sep	sat	92.5	88.0	698.6	7.1	19.6	48	2.7	0.0
	44	4	4	sep	wed	90.1	82.9	735.7	6.2	12.9	74	4.9	0.0
	45	5	6	sep	wed	94.3	85.1	692.3	15.9	25.9	24	4.0	0.0
	46	5	6	sep	mon	90.9	126.5	686.5	7.0	14.7	70	3.6	0.0
	47	6	6	jul	mon	94.2	62.3	442.9	11.0	23.0	36	3.1	0.0
	48	4	4	mar	mon	87.2	23.9	64.7	4.1	11.8	35	1.8	0.0
	49	4	4	mar	mon	87.6	52.2	103.8	5.0	11.0	46	5.8	0.0
	50	4	4	sep	thu	92.9	137.0	706.4	9.2	20.8	17	1.3	0.0
	51	4	3	aug	sun	90.2	99.6	631.2	6.3	21.5	34	2.2	0.0
	52	4	3	aug	wed	92.1	111.2	654.1	9.6	20.4	42	4.9	0.0
	53	4	3	aug	wed	92.1	111.2	654.1	9.6	20.4	42	4.9	0.0
	54	4	3	aug	thu	91.7	114.3	661.3	6.3	17.6	45	3.6	0.0
	55	4	3	sep	thu	92.9	137.0	706.4	9.2	27.7	24	2.2	0.0
	56	4	3	sep	tue	90.3	80.7	730.2	6.3	17.8	63	4.9	0.0
	57	4	3	oct	sun	92.6	46.5	691.8	8.8	13.8	50	2.7	0.0
	58	2	2	feb	mon	84.0	9.3	34.0	2.1	13.9	40	5.4	0.0
	59	2	2	feb	fri	86.6	13.2	43.0	5.3	12.3	51	0.9	0.0
	60	2	2	mar	sun	89.3	51.3	102.2	9.6	11.5	39	5.8	0.0
	61	2	2	mar	sun	89.3	51.3	102.2	9.6	5.5	59	6.3	0.0
	62	2	2	aug	thu	93.0	75.3	466.6	7.7	18.8	35	4.9	0.0
	63	2	2	aug	sun	90.2	99.6	631.2	6.3	20.8	33	2.7	0.0
	64	2	2	aug	mon	91.1	103.2	638.8	5.8	23.1	31	3.1	0.0
	65	2	2	aug	thu	91.7	114.3	661.3	6.3	18.6	44	4.5	0.0
	66	2	2	sep	fri	92.4	117.9	668.0	12.2	23.0	37	4.5	0.0
	67	2	2	sep	fri	92.4	117.9	668.0	12.2	19.6	33	5.4	0.0
	68	2	2	sep	fri	92.4	117.9	668.0	12.2	19.6	33	6.3	0.0
	69	4	5	mar	fri	91.7	33.3	77.5	9.0	17.2	26	4.5	0.0
	70	4	5	mar	fri	91.2	48.3	97.8	12.5	15.8	27	7.6	0.0
	71	4	5	sep	fri	94.3	85.1	692.3	15.9	17.7	37	3.6	0.0
	72	5	4	mar	fri	91.7	33.3	77.5	9.0	15.6	25	6.3	0.0
	73	5	4	aug	tue	88.8	147.3	614.5	9.0	17.3	43	4.5	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: 0.5950Epoch 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

Epoch 7/10
 14/14 [=====] - 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: 0.1073 - val_accuracy: 0.96699/10
 Epoch
 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

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 = 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

