```python
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd



from sklearn import metrics
from sklearn.metrics import classification_report,confusion_matrix

import warnings
warnings.filterwarnings(action="ignore")
%matplotlib inline
pd.set_option("display.max_rows", 1000)
pd.set_option("display.max_columns", 1000)

fires = pd.read_csv(r"C:\Users\Naren Karthick\Desktop\CSV\
forestfires.csv")
fires.head(15)
```

```
    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
```

```
fires.tail(10)
```

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

```
fires.describe().T
```

	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
```

```python
fires['area'].values[fires['area'].values > 0] = 1

fires = fires.rename(columns={'area': 'output'})
fires.head(5)
```

```
   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
```

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

```
              X         Y      FFMC       DMC        DC       ISI
temp  \
X      1.000000  0.539548 -0.021039 -0.048384 -0.085916  0.006210 -
0.051258
Y      0.539548  1.000000 -0.046308  0.007782 -0.101178 -0.024488 -
0.024103
FFMC  -0.021039 -0.046308  1.000000  0.382619  0.330512  0.531805
0.431532
DMC   -0.048384  0.007782  0.382619  1.000000  0.682192  0.305128
0.469594
DC    -0.085916 -0.101178  0.330512  0.682192  1.000000  0.229154
0.496208
ISI    0.006210 -0.024488  0.531805  0.305128  0.229154  1.000000
0.394287
temp  -0.051258 -0.024103  0.431532  0.469594  0.496208  0.394287
1.000000
RH     0.085223  0.062221 -0.300995  0.073795 -0.039192 -0.132517 -
0.527390
wind   0.018798 -0.020341 -0.028485 -0.105342 -0.203466  0.106826 -
0.227116
rain   0.065387  0.033234  0.056702  0.074790  0.035861  0.067668
0.069491
output 0.062491  0.056892  0.073823  0.062672  0.096724  0.035663
0.076047

             RH      wind      rain    output
X      0.085223  0.018798  0.065387  0.062491
```

```
Y       0.062221 -0.020341  0.033234  0.056892
FFMC    -0.300995 -0.028485  0.056702  0.073823
DMC      0.073795 -0.105342  0.074790  0.062672
DC      -0.039192 -0.203466  0.035861  0.096724
ISI     -0.132517  0.106826  0.067668  0.035663
temp    -0.527390 -0.227116  0.069491  0.076047
RH       1.000000  0.069410  0.099751 -0.035587
wind     0.069410  1.000000  0.061119  0.055702
rain     0.099751  0.061119  1.000000  0.025550
output  -0.035587  0.055702  0.025550  1.000000
```