

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

```
df = pd.read_csv('forestfires.csv');
```

```
df.head()
```

	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

```
def classify_area(area):
    if area == 0.0:
        return 'NotAffected'
    elif area <= 10.0:
        return 'PartiallyAffected'
    else:
        return 'MostlyAffected'
```

```
df['class'] = df['area'].apply(classify_area)
```

```
# Create subsets
```

```
not_affected = df[df['class'] == 'NotAffected']
```

```
partially_affected = df[df['class'] == 'PartiallyAffected']
```

```
mostly_affected = df[df['class'] == 'MostlyAffected']
```

```
not_affected.head()
```

	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

```
class
0 NotAffected
1 NotAffected
2 NotAffected
```

```
3 NotAffected
```

```
4 NotAffected
```

```
partially_affected.head()
```

	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain
area \												
138	9	9	jul	tue	85.8	48.3	313.4	3.9	18.0	42	2.7	0.0
0.36												
139	1	4	sep	tue	91.0	129.5	692.6	7.0	21.7	38	2.2	0.0
0.43												
140	2	5	sep	mon	90.9	126.5	686.5	7.0	21.9	39	1.8	0.0
0.47												
141	1	2	aug	wed	95.5	99.9	513.3	13.2	23.3	31	4.5	0.0
0.55												
142	8	6	aug	fri	90.1	108.0	529.8	12.5	21.2	51	8.9	0.0
0.61												

	class
138	PartiallyAffected
139	PartiallyAffected
140	PartiallyAffected
141	PartiallyAffected
142	PartiallyAffected

```
mostly_affected.head()
```

	X	Y	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain
area \												
194	2	2	aug	tue	94.8	108.3	647.1	17.0	24.6	22	4.5	0.0
10.01												
195	2	5	aug	fri	93.9	135.7	586.7	15.1	23.5	36	5.4	0.0
10.02												
196	6	5	apr	thu	81.5	9.1	55.2	2.7	5.8	54	5.8	0.0
10.93												
197	4	5	sep	thu	92.9	137.0	706.4	9.2	21.5	15	0.9	0.0
11.06												
198	3	4	sep	tue	91.0	129.5	692.6	7.0	13.9	59	6.3	0.0
11.24												

	class
194	MostlyAffected
195	MostlyAffected
196	MostlyAffected
197	MostlyAffected
198	MostlyAffected

```
merged_df = pd.concat([not_affected, partially_affected],  
ignore_index=True)
```

```
merged_df.head()
```



X	7	7	7	8	8	8	8	8	8	7	...
2											
Y	5	4	4	6	6	6	6	6	6	5	...
4											
month	mar	oct	oct	mar	mar	aug	aug	aug	sep	sep	...
aug											
day	fri	tue	sat	fri	sun	sun	mon	mon	tue	sat	...
fri											
FFMC	86.2	90.6	90.6	91.7	89.3	92.3	92.3	91.5	91.0	92.5	...
91.0											

	508	509	510	511	512	513	514	515	516
X	1	5	6	8	4	2	7	1	6
Y	2	4	5	6	3	4	4	4	3
month	aug	aug	aug	aug	aug	aug	aug	aug	nov
day	fri	fri	fri	sun	sun	sun	sun	sat	tue
FFMC	91.0	91.0	91.0	81.6	81.6	81.6	81.6	94.4	79.5

```
[5 rows x 517 columns]
```

```
melted_df = pd.melt(df, id_vars=['X', 'Y', 'month', 'day'],
var_name='Variable', value_name='Value')
```

```
melted_df.head()
```

	X	Y	month	day	Variable	Value
0	7	5	mar	fri	FFMC	86.2
1	7	4	oct	tue	FFMC	90.6
2	7	4	oct	sat	FFMC	90.6
3	8	6	mar	fri	FFMC	91.7
4	8	6	mar	sun	FFMC	89.3

```
# First ensure melt has a 'class' column if needed for pivot
wide_df = melted_df.pivot_table(index=['X', 'Y', 'month', 'day'],
                                columns='Variable',
                                values='Value',
                                aggfunc='first').reset_index()
```

```
wide_df.head()
```

Variable	X	Y	month	day	DC	DMC	FFMC	ISI	RH	area
class \										
0	1	2	aug	fri	529.8	108.0	90.1	12.5	66	0.0
NotAffected										
1	1	2	aug	sat	715.1	231.1	93.7	8.4	32	0.0
NotAffected										
2	1	2	aug	sun	601.4	142.4	91.4	10.6	39	0.0
NotAffected										
3	1	2	aug	thu	661.3	114.3	91.7	6.3	45	0.0
NotAffected										
4	1	2	aug	tue	561.6	121.2	91.0	7.0	19	0.0

NotAffected

Variable	rain	temp	wind
0	0.0	14.7	2.7
1	0.0	25.9	3.1
2	0.0	19.5	6.3
3	0.0	20.2	3.6
4	0.0	21.6	6.7