

In [21]:

```
# Wolkus Project
# import pandas library
import pandas as pd
```

In [23]:

```
# Reading LWSum file in which we take the Average of Temperature of 24 hours in a day and
Sum of Leaf wetness of 24 hour
df = pd.read_csv("LWSum.csv")
```

In [24]:

```
Risk = []
data = pd.DataFrame(df)
```

In [25]:

```
data.head()
```

Out[25]:

	deviceid	date	month	AVG(sampleddata.TC)	SUM(LW)	AVG(PLV2)	farmid	cropname
0	ZT1FC3FS	25-01-2021	1	15.797500	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate
1	ZT1FC3FS	26-01-2021	1	12.386250	14	0.0	2CkGqcWtBndq5pHCh	Pomegranate
2	ZT1FC3FS	27-01-2021	1	11.767708	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate
3	ZT1FC3FS	28-01-2021	1	13.056250	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate
4	ZT1FC3FS	29-01-2021	1	11.803750	36	0.0	2CkGqcWtBndq5pHCh	Pomegranate

In [26]:

```
# Applying the condition of Table 1 from Docx file:

for (row,rowData) in data.iterrows():
    if int(rowData['AVG(sampleddata.TC)']) < 5:
        Risk.append("Low")
    elif int(rowData['AVG(sampleddata.TC)']) >= 5 and int(rowData['AVG(sampleddata.TC)'])
< 18 and int(rowData['SUM(LW)']) < 14:
        Risk.append("Low")
    elif int(rowData['AVG(sampleddata.TC)']) >= 5 and int(rowData['AVG(sampleddata.TC)'])
< 18 and int(rowData['SUM(LW)']) >= 14:
        Risk.append("Medium")
    elif int(rowData['AVG(sampleddata.TC)']) >= 18 and int(rowData['AVG(sampleddata.TC)'])
< 25 and int(rowData['SUM(LW)']) < 6:
        Risk.append("Low")
    elif int(rowData['AVG(sampleddata.TC)']) >= 18 and int(rowData['AVG(sampleddata.TC)'])
< 25 and int(rowData['SUM(LW)']) >= 6 and int(rowData['SUM(LW)']) < 12:
        Risk.append("Medium")
    elif int(rowData['AVG(sampleddata.TC)']) >= 18 and int(rowData['AVG(sampleddata.TC)'])
< 25 and int(rowData['SUM(LW)']) >= 12:
        Risk.append("High")
    elif int(rowData['AVG(sampleddata.TC)']) >= 25 and int(rowData['AVG(sampleddata.TC)'])
< 30 and int(rowData['SUM(LW)']) < 10:
        Risk.append("Low")
    elif int(rowData['AVG(sampleddata.TC)']) >= 25 and int(rowData['AVG(sampleddata.TC)'])
< 30 and int(rowData['SUM(LW)']) >= 14:
        Risk.append("Medium")
    elif int(rowData['AVG(sampleddata.TC)']) >= 30:
        Risk.append("Low")
```

In [27]:

```
# Creating a new column Risk to see the risk after 24 hours
```

```
data['Risk'] = Risk
```

```
In [28]:
```

```
data.head()
```

```
Out[28]:
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	deviceid	date	month	AVG(sampledata.TC)	SUM(LW)	AVG(PLV2)	farmid	cropname	Risk
0	ZT1FC3FS	25-01-2021	1	15.797500	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low
1	ZT1FC3FS	26-01-2021	1	12.386250	14	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Medium
2	ZT1FC3FS	27-01-2021	1	11.767708	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low
3	ZT1FC3FS	28-01-2021	1	13.056250	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low
4	ZT1FC3FS	29-01-2021	1	11.803750	36	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Medium

```
In [30]:
```

```
data.to_csv('export1.csv',index=None,header=True)
```

```
In [58]:
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```
# Reading a new csv file in which we create avearge of Rain Intensity of 10 days
df1 = pd.read_csv("new.csv")
```

```
In [59]:
```

```
riskwater = []
data1 = pd.DataFrame(df1)
```

```
In [60]:
```

```
# Apply the condition of Table 2 from Docx file:

for (row,rowData) in data1.iterrows():
    if int(rowData['AVG(temp.PLV2)']) >= 0.28 and int(rowData['AVG(temp.PLV2)']) < 3:
        riskwater.append("Low")
    elif int(rowData['AVG(temp.PLV2)']) >= 3 and int(rowData['AVG(temp.PLV2)']) < 7:
        riskwater.append("Medium")
    elif int(rowData['AVG(temp.PLV2)']) >= 7 and int(rowData['AVG(temp.PLV2)']) < 25:
        riskwater.append("High")
    elif int(rowData['AVG(temp.PLV2)']) >= 25:
        riskwater.append("Low")
    else:
        riskwater.append("Low")
```

```
In [61]:
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```
# creating a new column riskwater in which risk of plants due to Rain Intensity in 10 th
day
data1['RiskWater'] = riskwater
```

```
In [62]:
```

```
data1.head()
```

```
Out[62]:
```

	deviceid	date	avg(temp.TC)	avg(temp.LW)	AVG(temp.PLV2)	farmid	cropname	RiskWater
0	ZT1FC3FS	25-01-2021	14.059979	5.0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low
1	ZT1FC3FS	4/2/2021	16.993417	3.9	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low
2	ZT1FC3FS	14-02-2021	19.144250	31.1	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low
3	ZT1FC3FS	24-02-2021	22.047625	6.3	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low
4	ZT1FC3FS	6/3/2021	23.744229	15.4	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low

In []:

```
# Applying the condition for Spray Scheduling
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In [44]:

```
k = []
H = 0
L = 0
M = 0
count = 0
for i in data['Risk']:
    if(i == "Low"):
        L +=1
    elif(i == "Medium"):
        M +=1
    else:
        H +=1
    if(count <9):
        k.append(0)
        count +=1
    elif (count==9):
        count = 0
        if ((H <= 4) or (H <= 3 and M <= 2) or (H<=2 and M<=4) or (H<=1 and M<=6) or (H
== 0 and M<=8)):
            k.append("No")
        else:
            k.append("Yes")
        L,H,M = 0,0,0
```

In [45]:

```
print(k)
```

```
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 'No', 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 'No', 0, 0, 0, 0, 0, 0, 0, 0,
0, 'Yes', 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 'No', 0, 0, 0, 0, 0, 0, 0, 0, 0, 'No', 0, 0, 0, 0, 0,
0, 0, 0, 0, 'No', 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 'No', 0, 0, 0, 0, 0, 0, 0, 0, 0, 'No', 0, 0,
0, 0, 0, 0, 0, 0, 0, 'No', 0, 0, 0, 0, 0, 0, 0, 0, 0, 'No', 0, 0, 0, 0, 0, 0, 0, 0, 0, 'No',
', 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 'No', 0, 0, 0, 0, 0, 0, 0]
```

In [46]:

```
data['Spray'] = k
```

In [47]:

```
l = []
for i in k:
    if(i == 0):
        l.append(0)
    else:
        l.append('Low')
```

In [48]:

```
data['RiskLV2'] = l
```

In [49]:

```
print(l)
```

```
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 'Low', 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 'Low', 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 'Low', 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 'Low', 0, 0, 0, 0, 0, 0, 0, 0, 0, 'Low', 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 'Low', 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 'Low', 0, 0, 0, 0, 0, 0, 0, 0, 0, 'Low
', 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 'Low', 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 'Low', 0, 0, 0, 0, 0, 0, 0,
, 0, 0, 'Low', 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 'Low', 0, 0, 0, 0, 0, 0, 0]
```

In [50]:

```
# Final CSV file here show that Spray is work or not
```

```
data.to_csv('FinalAnswerofSpary.csv', index=None, header=True)
```

In [52]:

```
data.head(20)
```

Out[52]:

	deviceid	date	month	AVG(sampledata.TC)	SUM(LW)	AVG(PLV2)	farmid	cropname	Risk	Spray
0	ZT1FC3FS	25-01-2021	1	15.797500	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	0
1	ZT1FC3FS	26-01-2021	1	12.386250	14	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Medium	0
2	ZT1FC3FS	27-01-2021	1	11.767708	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	0
3	ZT1FC3FS	28-01-2021	1	13.056250	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	0
4	ZT1FC3FS	29-01-2021	1	11.803750	36	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Medium	0
5	ZT1FC3FS	30-01-2021	1	12.098333	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	0
6	ZT1FC3FS	31-01-2021	1	13.884167	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	0
7	ZT1FC3FS	01-02-2021	2	15.496250	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	0
8	ZT1FC3FS	02-02-2021	2	16.718333	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	0
9	ZT1FC3FS	03-02-2021	2	17.591250	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	No
10	ZT1FC3FS	04-02-2021	2	18.457500	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	0
11	ZT1FC3FS	05-02-2021	2	17.185417	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	0
12	ZT1FC3FS	06-02-2021	2	14.406250	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	0
13	ZT1FC3FS	07-02-2021	2	13.842500	31	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Medium	0
14	ZT1FC3FS	08-02-2021	2	14.674583	4	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	0
15	ZT1FC3FS	09-02-2021	2	16.657917	4	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	0
16	ZT1FC3FS	10-02-2021	2	18.034583	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	0
17	ZT1FC3FS	11-02-2021	2	18.383750	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	0

	deviceid	date	month	AVG(sampledata.TC)	SUM(LW)	AVG(PLV2)	farmid	cropname	Risk	Spray
18	ZT1FC3FS	02-2021	2	18.779583	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	0
19	ZT1FC3FS	13-02-2021	2	19.512083	0	0.0	2CkGqcWtBndq5pHCh	Pomegranate	Low	No



In []: