```python
from google.colab import drive
drive.mount('/content/drive', force_remount=True)
```

    Mounted at /content/drive

```python
import numpy as np
import pandas as pd
```

```python
dir_path = '/content/drive/MyDrive/Lab6/'
```

Load Dataset

```python
X_train = pd.read_csv(dir_path + "N_X_train.csv",header=None)
Y_train = pd.read_csv(dir_path + "N_Y_train.csv",header=None)
X_test = pd.read_csv(dir_path + "N_X_test.csv",header=None)
#Y_test = pd.read_csv(dir_path + "N_Y_test.csv",header=None)
```

```python
Y_train.columns = ['Label']
```

```python
Y_train['Label'].unique()
```

    array([0, 1])

```python
Y_train.head()
```

	Label
0	0
1	0
2	0
3	0
4	0

```python
for i in range(0, 115):
    X_train.rename(columns={i: f'Column_{i}'}, inplace=True)
```

```python
X_train.head()
```

	Column_0	Column_1	Column_2	Column_3	Column_4	Column_5	Column_6	Colur
0	5.688842	82.000000	1.270000e-09	8.147002	81.999999	8.470000e-06	16.450803	81.99:
1	2.054324	73.819740	2.355805e+00	2.317782	73.295223	9.140854e+00	4.684740	72.70:
2	7.668872	82.000000	7.280000e-12	10.287058	82.000000	3.020000e-07	22.760781	81.99&
3	4.138542	74.000000	1.460000e-11	4.851187	74.000000	2.510000e-06	8.148162	74.06∠
4	2.191980	81.967791	7.075699e-01	3.022267	81.584711	8.963883e+00	11.588484	79.30:

5 rows × 115 columns

```python
for i in range(0, 115):
    X_test.rename(columns={i: f'Column_{i}'}, inplace=True)
```

```python
X_test.head()
```

	Column_0	Column_1	Column_2	Column_3	Column_4	Column_5	Column_6	Column_7
0	3.999561	81.998951	2.307881e-02	4.010667	81.942775	1.255672	5.436740	78.745968
1	2.296989	67.382381	6.278587e+01	2.704489	67.083816	60.901900	4.923927	67.539508
2	6.668247	81.999989	2.459550e-04	9.285530	81.998762	0.027229	22.490466	81.919482
3	6.589568	80.161164	3.707308e+01	8.978418	78.856422	59.276630	19.902186	77.257854
4	1.000006	74.000000	3.070000e-09	1.001488	74.000016	0.000130	1.690290	74.683022

5 rows × 115 columns

```python
print(X_train.shape)
print(Y_train.shape)
print(X_test.shape)
#print(Y_test.shape)
```

```
(250202, 115)
(250202, 1)
(23040, 115)
```

Training Model

```python
# Decision Tree model
from sklearn.tree import DecisionTreeClassifier

# instantiate
tree = DecisionTreeClassifier(max_depth = 5)
# fit
tree.fit(X_train, Y_train)
```

```
▼         DecisionTreeClassifier
    DecisionTreeClassifier(max_depth=5)
```

                   + Code   + Text

```python
y_pred = tree.predict(X_test)
```

Hint Flag

```python
f = np.zeros((180, 128))
```

```python
f
```

```
array([[0., 0., 0., ..., 0., 0., 0.],
       [0., 0., 0., ..., 0., 0., 0.],
       [0., 0., 0., ..., 0., 0., 0.],
       ...,
       [0., 0., 0., ..., 0., 0., 0.],
       [0., 0., 0., ..., 0., 0., 0.],
       [0., 0., 0., ..., 0., 0., 0.]])
```

```python
from google.colab.patches import cv2_imshow
a = np.array(y_pred).reshape(23040, 1)
a = a.reshape(180,128)
a[a == 1] = 255
cv2_imshow(a)
```