```python
import pandas as pd
d1= pd.read_csv('/content/test.csv')
d2=pd.read_csv('/content/train.csv')
print(d1)
print(d2)
```

```
       id  battery_power  blue  clock_speed  dual_sim  fc  four_g
int_memory  \
0       1           1043     1          1.8         1  14       0
5
1       2            841     1          0.5         1   4       1
61
2       3           1807     1          2.8         0   1       0
27
3       4           1546     0          0.5         1  18       1
25
4       5           1434     0          1.4         0  11       1
49
..    ...            ...   ...          ...       ...  ..     ...
...
995   996           1700     1          1.9         0   0       1
54
996   997            609     0          1.8         1   0       0
13
997   998           1185     0          1.4         0   1       1
8
998   999           1533     1          0.5         1   0       0
50
999  1000           1270     1          0.5         0   4       1
35

     m_dep  mobile_wt  ...  pc  px_height  px_width   ram  sc_h  sc_w
\
0      0.1        193  ...  16        226      1412  3476    12     7

1      0.8        191  ...  12        746       857  3895     6     0

2      0.9        186  ...   4       1270      1366  2396    17    10

3      0.5         96  ...  20        295      1752  3893    10     0

4      0.5        108  ...  18        749       810  1773    15     8

..     ...        ...  ...  ..        ...       ...   ...   ...   ...

995    0.5        170  ...  17        644       913  2121    14     8

996    0.9        186  ...   2       1152      1632  1933     8     1

997    0.5         80  ...  12        477       825  1223     5     0
```

```
998    0.4        171  ...  12         38       832  2509    15    11

999    0.1        140  ...  19        457       608  2828     9     2

     talk_time  three_g  touch_screen  wifi
0            2        0             1     0
1            7        1             0     0
2           10        0             1     1
3            7        1             1     0
4            7        1             0     1
..         ...      ...           ...   ...
995         15        1             1     0
996         19        0             1     1
997         14        1             0     0
998          6        0             1     0
999          3        1             0     1

[1000 rows x 21 columns]
      battery_power  blue  clock_speed  dual_sim  fc  four_g
int_memory  \
0               842     0          2.2         0   1       0
7
1              1021     1          0.5         1   0       1
53
2               563     1          0.5         1   2       1
41
3               615     1          2.5         0   0       0
10
4              1821     1          1.2         0  13       1
44
...             ...   ...          ...       ...  ..     ...          .
..
1995            794     1          0.5         1   0       1
2
1996           1965     1          2.6         1   0       0
39
1997           1911     0          0.9         1   1       1
36
1998           1512     0          0.9         0   4       1
46
1999            510     1          2.0         1   5       1
45

      m_dep  mobile_wt  n_cores  ...  px_height  px_width   ram  sc_h
sc_w  \
0       0.6        188        2  ...         20       756  2549     9
7
1       0.7        136        3  ...        905      1988  2631    17
```

```
3
2       0.9         145          5  ...         1263       1716  2603     11
2
3       0.8         131          6  ...         1216       1786  2769     16
8
4       0.6         141          2  ...         1208       1212  1411      8
2
...     ...         ...        ...  ...          ...        ...   ...    ...
...
1995    0.8         106          6  ...         1222       1890   668     13
4
1996    0.2         187          4  ...          915       1965  2032     11
10
1997    0.7         108          8  ...          868       1632  3057      9
1
1998    0.1         145          5  ...          336        670   869     18
10
1999    0.9         168          6  ...          483        754  3919     19
4

      talk_time  three_g  touch_screen  wifi  price_range
0            19        0             0     1            1
1             7        1             1     0            2
2             9        1             1     0            2
3            11        1             0     0            2
4            15        1             1     0            1
...         ...      ...           ...   ...          ...
1995         19        1             1     0            0
1996         16        1             1     1            2
1997          5        1             1     0            3
1998         19        1             1     1            0
1999          2        1             1     1            3

[2000 rows x 21 columns]

X= d2.drop('touch_screen', axis=1)
y= d2['touch_screen']
print(X)

      battery_power  blue  clock_speed  dual_sim  fc  four_g
int_memory  \
0               842     0          2.2         0   1       0
7
1              1021     1          0.5         1   0       1
53
2               563     1          0.5         1   2       1
41
3               615     1          2.5         0   0       0
10
4              1821     1          1.2         0  13       1
```

```
44
...             ...   ...          ...       ...  ..     ...         .
..
1995            794     1          0.5         1   0       1
2
1996           1965     1          2.6         1   0       0
39
1997           1911     0          0.9         1   1       1
36
1998           1512     0          0.9         0   4       1
46
1999            510     1          2.0         1   5       1
45

      m_dep  mobile_wt  n_cores  pc  px_height  px_width   ram  sc_h
sc_w  \
0       0.6        188        2   2         20       756  2549     9
7
1       0.7        136        3   6        905      1988  2631    17
3
2       0.9        145        5   6       1263      1716  2603    11
2
3       0.8        131        6   9       1216      1786  2769    16
8
4       0.6        141        2  14       1208      1212  1411     8
2
...     ...        ...      ...  ..        ...       ...   ...   ...
...
1995    0.8        106        6  14       1222      1890   668    13
4
1996    0.2        187        4   3        915      1965  2032    11
10
1997    0.7        108        8   3        868      1632  3057     9
1
1998    0.1        145        5   5        336       670   869    18
10
1999    0.9        168        6  16        483       754  3919    19
4

      talk_time  three_g  wifi  price_range
0            19        0     1            1
1             7        1     0            2
2             9        1     0            2
3            11        1     0            2
4            15        1     0            1
...         ...      ...   ...          ...
1995         19        1     0            0
1996         16        1     1            2
1997          5        1     0            3
```

```
1998         19        1     1            0
1999          2        1     1            3

[2000 rows x 20 columns]
```

```
X_test = d2.drop('touch_screen', axis=1)
y_test = d2['touch_screen']

from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y,
test_size=0.2, random_state=42)

print(X_train)
```

```
      battery_power  blue  clock_speed  dual_sim  fc  four_g
int_memory  \
968            1923     0          0.5         1   7       0
46
240             633     1          2.2         0   0       1
49
819            1236     0          0.9         1   2       1
57
692             781     0          1.1         0   2       0
38
420            1456     1          0.5         1   7       0
7
...             ...   ...          ...       ...  ..     ...         .
..
1130           1975     1          1.9         1   2       0
31
1294            589     1          0.5         0   1       1
59
860            1829     1          0.5         0   0       1
15
1459           1927     0          0.9         1   3       0
11
1126            635     1          0.6         1   1       1
50

      m_dep  mobile_wt  n_cores  pc  px_height  px_width   ram  sc_h
sc_w  \
968     0.5        191        1  10        767      1759  1489    10
9
240     0.1        139        8   1        529      1009  3560    11
1
819     0.1        188        1  14        517       809  1406    14
12
692     0.4        198        5   7        304      1674  3508    13
8
420     0.4        105        5  12        823      1104  1587     6
```

```
5
...     ...        ...      ...  ..        ...       ...   ...   ...
...
1130    0.9        151        1  17        775      1607  3022    13
5
1294    0.7        146        8   4        759      1858   362    16
10
860     0.4        160        5   7        729      1267  2080    16
11
1459    0.4        190        8  12        491      1506  2916    16
11
1126    0.3         97        5  13        193       989  2107    13
12

      talk_time  three_g  wifi  price_range
968           3        1     1            1
240          16        1     1            2
819          20        1     1            0
692           5        0     1            3
420          20        1     1            1
...         ...      ...   ...          ...
1130         19        0     1            3
1294          6        1     1            0
860          12        1     1            2
1459         18        0     1            3
1126         12        1     0            1

[1600 rows x 20 columns]
```

```
print(y_train)
```

```
968     1
240     1
819     0
692     0
420     0
       ..
1130    0
1294    1
860     0
1459    1
1126    0
Name: touch_screen, Length: 1600, dtype: int64
```

```
from sklearn.preprocessing import MinMaxScaler
scaler = MinMaxScaler()
X_train_scaled = scaler.fit_transform(x)
X_test_scaled = scaler.fit_transform(X_test)
print(X_train_scaled)
```

```
[[0.22778891 0.         0.68       ... 0.         1.
0.33333333]
 [0.34736139 1.         0.         ... 1.         0.
0.66666667]
 [0.04141617 1.         0.         ... 1.         0.
0.66666667]
 ...
 [0.94188377 0.         0.16       ... 1.         0.         1.
]
 [0.6753507  0.         0.16       ... 1.         1.         0.
]
 [0.00601202 1.         0.6        ... 1.         1.         1.
]]
```

```python
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import accuracy_score
model = LogisticRegression()
model.fit(X_train_scaled, y)
y_pred = model.predict(X_test_scaled)
accuracy = accuracy_score(y_test, y_pred)
print(f'Accuracy: {accuracy}')
```

```
Accuracy: 0.5425
```

```python
from sklearn.metrics import accuracy_score, precision_score,
recall_score,confusion_matrix

accuracy = accuracy_score(y_test, y_pred)
precision = precision_score(y_test, y_pred, average='weighted')
recall = recall_score(y_test, y_pred, average='weighted')
conf_matrix = confusion_matrix(y_test, y_pred)
print("Accuracy:", accuracy)
print("Precision:", precision)
print("Recall:", recall)
print("Confusion Matrix:")
print(conf_matrix)
```

```
Accuracy: 0.5425
Precision: 0.5436003185115903
Recall: 0.5425
Confusion Matrix:
[[ 99 103]
 [ 80 118]]
```