In [1]: import numpy as np
 import pandas as pd
 import matplotlib.pyplot as plt,seaborn as sns

Out[2]:

	id	battery_power	blue	clock_speed	dual_sim	fc	four_g	int_memory	m_dep	mobile_wt	 рс	px_height
0	1	1043	1	1.8	1	14	0	5	0.1	193	 16	226
1	2	841	1	0.5	1	4	1	61	0.8	191	 12	746
2	3	1807	1	2.8	0	1	0	27	0.9	186	 4	1270
3	4	1546	0	0.5	1	18	1	25	0.5	96	 20	295
4	5	1434	0	1.4	0	11	1	49	0.5	108	 18	749
995	996	1700	1	1.9	0	0	1	54	0.5	170	 17	644
996	997	609	0	1.8	1	0	0	13	0.9	186	 2	1152
997	998	1185	0	1.4	0	1	1	8	0.5	80	 12	477
998	999	1533	1	0.5	1	0	0	50	0.4	171	 12	38
999	1000	1270	1	0.5	0	4	1	35	0.1	140	 19	457

1000 rows × 21 columns

In [3]: test_df=pd.read_csv(r"C:\Users\Lenovo\OneDrive\Desktop\Data Sets\Mobile_Price_Classification_tra:
 test_df

Out[3]:

	battery_power	blue	clock_speed	dual_sim	fc	four_g	int_memory	m_dep	mobile_wt	n_cores	 px_height
0	842	0	2.2	0	1	0	7	0.6	188	2	 20
1	1021	1	0.5	1	0	1	53	0.7	136	3	 905
2	563	1	0.5	1	2	1	41	0.9	145	5	 1263
3	615	1	2.5	0	0	0	10	0.8	131	6	 1216
4	1821	1	1.2	0	13	1	44	0.6	141	2	 1208
1995	794	1	0.5	1	0	1	2	0.8	106	6	 1222
1996	1965	1	2.6	1	0	0	39	0.2	187	4	 915
1997	1911	0	0.9	1	1	1	36	0.7	108	8	 868
1998	1512	0	0.9	0	4	1	46	0.1	145	5	 336
1999	510	1	2.0	1	5	1	45	0.9	168	6	 483

2000 rows × 21 columns

In [4]: train_df.info()

```
RangeIndex: 1000 entries, 0 to 999
Data columns (total 21 columns):
    Column
                    Non-Null Count
                                   Dtype
 0
                    1000 non-null
                                    int64
    id
    battery_power 1000 non-null
                                    int64
 1
                                    int64
 2
    blue
                    1000 non-null
 3
                                    float64
    clock speed
                    1000 non-null
 4
    dual sim
                    1000 non-null
                                    int64
 5
    fc
                   1000 non-null
                                    int64
 6
     four g
                   1000 non-null
                                    int64
    int_memory
 7
                   1000 non-null
                                    int64
 8
    m dep
                    1000 non-null
                                    float64
 9
    mobile wt
                    1000 non-null
                                    int64
 10
    n_cores
                    1000 non-null
                                    int64
 11
                    1000 non-null
                                    int64
    рс
                   1000 non-null
                                    int64
 12
    px height
    px_width
 13
                   1000 non-null
                                    int64
                    1000 non-null
 14 ram
                                    int64
 15 sc_h
                   1000 non-null
                                    int64
                   1000 non-null
 16 sc_w
                                    int64
 17 talk_time
                    1000 non-null
                                    int64
 18 three_g
                    1000 non-null
                                    int64
                   1000 non-null
 19 touch_screen
                                    int64
 20 wifi
                    1000 non-null
                                    int64
dtypes: float64(2), int64(19)
memory usage: 164.2 KB
```

<class 'pandas.core.frame.DataFrame'>

In [5]: test_df.info()

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2000 entries, 0 to 1999
Data columns (total 21 columns):
# Column Non-Null Count Dtype
```

```
---
    -----
                    -----
0
     battery power 2000 non-null
                                    int64
 1
     blue
                    2000 non-null
                                    int64
     clock_speed
 2
                    2000 non-null
                                    float64
                    2000 non-null
 3
    dual_sim
                                    int64
                    2000 non-null
 4
    fc
                                   int64
 5
                    2000 non-null
    four g
                                    int64
 6
     int memory
                    2000 non-null
                                    int64
                    2000 non-null
                                    float64
 7
    m dep
 8
    mobile wt
                    2000 non-null
                                    int64
 9
    n_cores
                    2000 non-null
                                    int64
 10
    рс
                    2000 non-null
                                    int64
 11
    px_height
                    2000 non-null
                                    int64
 12
    px width
                    2000 non-null
                                    int64
 13
    ram
                    2000 non-null
                                    int64
                    2000 non-null
 14 sc h
                                    int64
 15 sc_w
                   2000 non-null
                                   int64
                   2000 non-null
 16 talk_time
                                   int64
 17 three_g
                    2000 non-null
                                   int64
                   2000 non-null
 18 touch screen
                                    int64
 19 wifi
                    2000 non-null
                                    int64
 20 price range
                    2000 non-null
                                    int64
dtypes: float64(2), int64(19)
memory usage: 328.3 KB
```

localhost:8888/notebooks/Random Forest(Mobile Price).ipynb

```
In [7]: x=train_df.drop('wifi',axis=1)
          y=train_df['wifi']
 In [9]: x=test_df.drop('wifi',axis=1)
          y=test_df['wifi']
In [10]: train_df['dual_sim'].value_counts()
Out[10]: dual_sim
          1
                517
          0
                483
          Name: count, dtype: int64
In [11]: test_df['blue'].value_counts()
Out[11]: blue
          0
                1010
          1
                 990
          Name: count, dtype: int64
In [12]: T={"Home Owner":{"Yes":1,"No":0}}
          train_df=train_df.replace(T)
          print(train_df)
                      battery_power
                                       blue
                                              clock_speed dual_sim
                                                                       fc
                                                                                    int_memory
                                                                            four_g
          0
                                1043
                                          1
                                                       1.8
                                                                       14
                                                                                 0
                                                                                               5
                                                                                                  \
                   1
                                                                    1
          1
                   2
                                                       0.5
                                                                        4
                                                                                              61
                                 841
                                          1
                                                                                 1
                                                                    1
          2
                                                                        1
                   3
                                1807
                                          1
                                                       2.8
                                                                    0
                                                                                 0
                                                                                              27
          3
                                1546
                                                       0.5
                                                                                              25
                   4
                                          0
                                                                    1
                                                                       18
                                                                                 1
          4
                   5
                                1434
                                          0
                                                       1.4
                                                                    0
                                                                       11
                                                                                 1
                                                                                              49
                 . . .
                                  . . .
                                                       . . .
                                                                        . .
                                        . . .
                                                                                             . . .
          995
                                1700
                                                       1.9
                                                                        0
                                                                                              54
                 996
                                          1
                                                                    0
                                                                                 1
          996
                 997
                                 609
                                          0
                                                       1.8
                                                                        0
                                                                                 0
                                                                                              13
                                                                    1
                 998
          997
                                                                                              8
                                1185
                                          a
                                                       1.4
                                                                    a
                                                                        1
                                                                                 1
                                                                                              50
          998
                 999
                                                                        0
                                                                                 0
                                1533
                                          1
                                                       0.5
                                                                    1
                                                                                 1
                1000
                                          1
                                                                        4
                                                                                              35
          999
                                1270
                                                       0.5
                       mobile wt
                                             px_height px_width
                                                                                  SC_W
                m_dep
                                         рс
                                                                      ram
                                                                            sc h
                                   . . .
          0
                              193
                                                                                      7
                  0.1
                                         16
                                                    226
                                                               1412
                                                                     3476
                                                                              12
                                                                                         \
                                   . . .
          1
                  0.8
                              191
                                                    746
                                                                857
                                                                     3895
                                                                                      0
                                         12
                                                                               6
                                   . . .
          2
                  0.9
                              186
                                          4
                                                   1270
                                                               1366
                                                                     2396
                                                                                     10
                                                                              17
          3
                  0.5
                               96
                                         20
                                                    295
                                                               1752
                                                                     3893
                                                                              10
                                                                                      0
          4
                  0.5
                              108
                                         18
                                                    749
                                                                810
                                                                     1773
                                                                              15
                                                                                      8
                              . . .
                                         . .
                                                    . . .
                                                                . . .
                                                                      . . .
                  . . .
          995
                              170
                                         17
                                                    644
                                                                913
                                                                     2121
                                                                                      8
                  0.5
                                                                              14
          996
                  0.9
                              186
                                          2
                                                   1152
                                                               1632
                                                                     1933
                                                                               8
                                                                                      1
          997
                               80
                                                                825
                                                                     1223
                                                                               5
                                                                                      0
                  0.5
                                         12
                                                    477
          998
                              171
                                                                     2509
                                                                              15
                  0.4
                                         12
                                                      38
                                                                832
                                                                                     11
          999
                              140
                                                    457
                                                                608 2828
                                                                               9
                  0.1
                                         19
                                                                                      2
                            three_g
                talk_time
                                     touch_screen
                                                     wifi
          0
                         2
                                   0
                                                  1
                                                         0
          1
                        7
                                   1
                                                  0
                                                         0
          2
                       10
                                   0
                                                  1
                                                         1
          3
                         7
                                   1
                                                  1
                                                         0
                         7
          4
                                   1
                                                  0
                                                         1
                       . . .
                                 . . .
                                                       . . .
          995
                                                         0
                       15
                                  1
                                                  1
                       19
          996
                                   0
                                                  1
                                                         1
          997
                       14
                                   1
                                                  0
                                                         0
          998
                         6
                                   0
                                                  1
                                                         0
                         3
          999
                                   1
                                                  0
                                                         1
          [1000 rows x 21 columns]
```

```
In [13]: T={"Home Owner":{"Yes":1,"No":0}}
    train_df=train_df.replace(T)
    print(train_df)
```

	id	battery_power	blue	clock_speed	dual_si	.m fc	four_g	int_r	nemory	
0	1	1043	1	1.8	3	1 14	0		5	\
1	2	841	. 1	0.5	.	1 4	1	1 61		
2	3	1807	1	2.8	3	0 1			27	
3	4	1546	0	0.5	;	1 18	1	1 25		
4	5	1434	. 0	1.4	ļ	0 11	1	49		
995	996	1700	1	1.9)	0 0			54	
996	997	609	0	1.8	3	1 0			13	
997	998	1185	0	1.4	ļ	0 1		1 8		
998	999	1 533	1	0.5	;	1 0		0 5		
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 <u></u> g	touch_	screen wifi	-					
0		2 0		1 0)					

	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]

```
In [14]: T={"Home Owner":{"Yes":1,"No":0}}
          test_df=test_df.replace(T)
          print(test_df)
                                       clock_speed dual_sim
                battery_power
                                 blue
                                                                fc
                                                                    four_g
                                                                             int memory
          0
                           842
                                                2.2
                                                             0
                                                                          0
                                    0
                                                                 1
                                                                                       7
                          1021
                                                0.5
                                                                 0
                                                                                      53
          1
                                    1
                                                             1
                                                                          1
          2
                           563
                                                0.5
                                                             1
                                                                 2
                                                                          1
                                                                                      41
                                    1
                                                                 0
          3
                           615
                                                2.5
                                                             0
                                                                          0
                                                                                      10
                                    1
          4
                          1821
                                                1.2
                                                             0
                                                                13
                                                                          1
                                                                                      44
                                    1
                            . . .
          1995
                           794
                                                0.5
                                                             1
                                                                 0
                                                                          1
                                                                                       2
                                    1
          1996
                          1965
                                    1
                                                2.6
                                                             1
                                                                          0
                                                                                      39
          1997
                          1911
                                    0
                                                0.9
                                                             1
                                                                 1
                                                                          1
                                                                                      36
          1998
                          1512
                                                0.9
                                                                                      46
                                    0
                                                             0
                                                                 4
                                                                          1
                           510
                                                                 5
                                                                                      45
          1999
                                    1
                                                2.0
                                                             1
                                                                          1
                        mobile_wt
                m_dep
                                    n_cores
                                                   px_height
                                                               px_width
                                                                           ram
                                                                                 sc_h
                                                                                       SC_W
                                              . . .
          0
                   0.6
                               188
                                           2
                                                           20
                                                                     756
                                                                          2549
                                                                                    9
                                                                                           7
                                                                                              \
                                              . . .
                   0.7
                               136
                                           3
                                                          905
                                                                    1988
                                                                                   17
                                                                                           3
          1
                                                                          2631
                                              . . .
          2
                   0.9
                               145
                                           5
                                                         1263
                                                                    1716
                                                                          2603
                                                                                   11
                                                                                           2
                                              . . .
                   0.8
                               131
                                                                          2769
                                                                                           8
          3
                                           6
                                                         1216
                                                                    1786
                                                                                   16
                                             . . .
                                                         1208
                                                                                           2
          4
                  0.6
                               141
                                           2
                                                                    1212 1411
                                                                                    8
                                             . . .
                                              . . .
          1995
                  0.8
                               106
                                           6
                                                         1222
                                                                    1890
                                                                           668
                                                                                   13
                                                                                          4
                                             . . .
          1996
                  0.2
                               187
                                                          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
                                                          483
                                                                     754
                                                                          3919
                               168
                                           6
                                                                                   19
                                                                                           4
                 talk_time
                            three_g
                                     touch_screen
                                                     wifi price_range
          0
                        19
                                   0
                                                  0
                                                                       1
                                                         1
          1
                         7
                                   1
                                                  1
                                                         0
                                                                       2
                         9
          2
                                   1
                                                  1
                                                         0
                                                                       2
                                                                       2
          3
                        11
                                   1
                                                  0
                                                         a
                        15
                                                  1
                                                                       1
          4
                                   1
                                                         0
          1995
                        19
                                                  1
                                                         0
                                                                       0
          1996
                        16
                                   1
                                                  1
                                                         1
                                                                       2
          1997
                         5
                                   1
                                                  1
                                                         0
                                                                       3
          1998
                        19
                                   1
                                                  1
                                                                       0
                                                         1
          1999
                         2
                                   1
                                                  1
                                                         1
                                                                       3
          [2000 rows x 21 columns]
In [15]: x=train_df.drop('wifi',axis=1)
          y=train_df['wifi']
In [16]: x=test_df.drop('wifi',axis=1)
          y=test_df['wifi']
In [17]: from sklearn.model selection import train test split
          x_train,x_test,y_train,y_test = train_test_split(x,y,train_size=0.7,random_state=42)
          x_train.shape,x_test.shape
Out[17]: ((1400, 20), (600, 20))
```

```
In [18]: from sklearn.ensemble import RandomForestClassifier
         rfc = RandomForestClassifier()
         rfc.fit(x_train,y_train)
Out[18]:
          ▼ RandomForestClassifier
          RandomForestClassifier()
In [19]: rf = RandomForestClassifier()
In [20]: params = {'max_depth': [2,3,5,10,20],
          'min_samples_leaf': [5,10,20,50,100,200],
          'n_estimators': [10,25,30,50,100,200]}
In [21]: from sklearn.model selection import GridSearchCV
         grid_search = GridSearchCV(estimator=rf,param_grid=params,cv = 2, scoring='accuracy')
         grid_search.fit(x_train,y_train)
Out[21]:
                      GridSearchCV
           ▶ estimator: RandomForestClassifier
                ▶ RandomForestClassifier
In [22]: grid_search.best_score_
Out[22]: 0.5285714285714285
In [23]: rf_best = grid_search.best_estimator_
         print(rf_best)
         RandomForestClassifier(max_depth=3, min_samples_leaf=100, n_estimators=10)
```

```
In [24]:
                       from sklearn.tree import plot tree
                       plt.figure(figsize=(80,40))
                       plot tree(rf best.estimators [5], feature names = x.columns,class names=['Yes',"No"],filled=True
Out[24]: [Text(0.4230769230769231, 0.875, 'price range <= 1.5\ngini = 0.5\nsamples = 880\nvalue = [702,
                       698]\nclass = Yes'),
                         Text(0.15384615384615385, 0.625, 'int memory <= 27.5\ngini = 0.496\nsamples = 443\nvalue = [32]
                       3, 386]\nclass = No'),
                         Text(0.07692307692307693, 0.375, 'gini = 0.487 \setminus samples = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = N = 185 \setminus value = [120, 166] \setminus samples = [
                          Text(0.23076923076923078, 0.375, 'clock speed <= 1.15\ngini = 0.499\nsamples = 258\nvalue = [2
                       03, 220]\nclass = No'),
                         Text(0.15384615384615385, 0.125, 'gini = 0.471\nsamples = 106\nvalue = [66, 108]\nclass = N
                       o'),
                         Text(0.3076923076923077, 0.125, 'gini = 0.495\nsamples = 152\nvalue = [137, 112]\nclass = Ye
                       s'),
                          Text(0.6923076923076923, 0.625, 'four g <= 0.5\ngini = 0.495\nsamples = 437\nvalue = [379, 31
                       2]\nclass = Yes'),
                         Text(0.5384615384615384, 0.375, 'dual sim <= 0.5\ngini = 0.487\nsamples = 211\nvalue = [194, 1
                       40]\nclass = Yes'),
                         Text(0.46153846153846156, 0.125, 'gini = 0.495\nsamples = 103\nvalue = [91, 74]\nclass = Ye
                       s'),
                         Text(0.6153846153846154, 0.125, 'gini = 0.476\nsamples = 108\nvalue = [103, 66]\nclass = Ye
                       s'),
                          Text(0.8461538461538461, 0.375, 'blue <= 0.5\ngini = 0.499\nsamples = 226\nvalue = [185, 172]
                       \nclass = Yes'),
                         Text(0.7692307692307693, 0.125, 'gini = 0.486\nsamples = 122\nvalue = [109, 78]\nclass = Ye
                       s'),
                          Text(0.92307692307, 0.125, 'gini = 0.494\nsamples = 104\nvalue = [76, 94]\nclass = No')]
                                                                                                            price_range <= 1.5
                                                                                                                   \overline{gini} = 0.5
                                                                                                               samples = 880
                                                                                                            value = [702, 698]
                                                                                                                  class = Yes
                                           int memory <= 27.5
                                                                                                                                                                               four_g <= 0.5
gini = 0.495
                                                 gini = 0.496
                                                samples = 443
                                                                                                                                                                               samples = 437
                                             value = [323, 386]
                                                                                                                                                                            value = [379, 312]
                                                   class = No
                                                                                                                                                                                 class = Yes
                                                             clock_speed <= 1.15
                                                                                                                                         dual sim \leq 0.5
                                                                                                                                                                                                                     blue <= 0.5
                                gini = 0.487
                                                                    gini = 0.499
                                                                                                                                            gini = 0.487
                                                                                                                                                                                                                     gini = 0.499
                              samples = 185
                                                                  samples = 258
                                                                                                                                          samples = 211
                                                                                                                                                                                                                  samples = 226
                           value = [120, 166]
                                                                                                                                                                                                                value = [185, 172]
                                                               value = [203, 220]
                                                                                                                                        value = [194, 140]
                                 class = No
                                                                      class = No
                                                                                                                                             class = Yes
                                                                                                                                                                                                                      class = Yes
                                                  qini = 0.471
                                                                                      aini = 0.495
                                                                                                                          aini = 0.495
                                                                                                                                                               aini = 0.476
                                                                                                                                                                                                  qini = 0.486
                                                                                                                                                                                                                                       aini = 0.494
                                                samples = 106
                                                                                                                        samples = 103
                                                                                                                                                            samples = 108
                                                                                    samples = 152
                                                                                                                                                                                                 samples = 122
                                                                                                                                                                                                                                     samples = 104
                                                                                                                                                                                                                                    value = [76, 94]
                                              value = [66, 108]
                                                                                 value = [137, 112]
                                                                                                                        value = [91, 74]
                                                                                                                                                           value = [103, 66]
                                                                                                                                                                                               value = [109, 78]
                                                   class = No
                                                                                       class = Yes
                                                                                                                           class = Yes
                                                                                                                                                                class = Yes
                                                                                                                                                                                                    class = Yes
                                                                                                                                                                                                                                        class = No
```

```
In [25]: from sklearn.tree import plot_tree
         plt.figure(figsize=(80,40))
         plot tree(rf best.estimators [7],feature names=x.columns,class names=["Yes","No"],filled=True)
Out[25]: [Text(0.444444444444444, 0.875, 'fc <= 0.5\ngini = 0.5\nsamples = 904\nvalue = [710, 690]\ncla
         ss = Yes'),
          Text(0.2222222222222, 0.625, 'sc h <= 12.5\ngini = 0.486\nsamples = 221\nvalue = [210, 149]
         \nclass = Yes'),
          Text(0.11111111111111, 0.375, 'gini = 0.431\nsamples = 115\nvalue = [131, 60]\nclass = Ye
          Text(0.333333333333333, 0.375, 'gini = 0.498\nsamples = 106\nvalue = [79, 89]\nclass = No'),
          Text(0.666666666666666, 0.625, 'px width <= 783.5\ngini = 0.499\nsamples = 683\nvalue = [500,
         541\nclass = No'),
          Text(0.555555555555556, 0.375, 'gini = 0.491\nsamples = 140\nvalue = [123, 94]\nclass = Ye
         s'),
          Text(0.7777777777778, 0.375, 'pc <= 11.5\ngini = 0.496\nsamples = 543\nvalue = [377, 447]\n
         class = No'),
          Text(0.666666666666666, 0.125, 'gini = 0.486\nsamples = 260\nvalue = [165, 231]\nclass = N
         o'),
          Text(0.88888888888888, 0.125, 'gini = 0.5\nsamples = 283\nvalue = [212, 216]\nclass = No')]
                                                fc <= 0.5
                                                gini = 0.5
                                             samples = 904
                                            value = [710, 690]
                                               class = Yes
                        sc h <= 12.5
                                                                 px width <= 783.5
                         gini = 0.486
                                                                    gini = 0.499
                        samples = 221
                                                                   samples = 683
                      value = [210, 149]
                                                                 value = [500, 541]
                          class = Yes
                                                                     class = No
                                                                               pc <= 11.5
               aini = 0.431
                                    aini = 0.498
                                                         qini = 0.491
                                                                               qini = 0.496
             samples = 115
                                   samples = 106
                                                        samples = 140
                                                                              samples = 543
                                                       value = [123, 94]
            value = [131, 60]
                                  value = [79, 89]
                                                                            value = [377, 447]
               class = Yes
                                     class = No
                                                          class = Yes
                                                                                class = No
                                                                    gini = 0.486
                                                                                           qini = 0.5
                                                                   samples = 260
                                                                                        samples = 283
                                                                 value = [165, 231]
                                                                                       value = [212, 216]
                                                                     class = No
                                                                                          class = No
In [26]: rf best.feature importances
Out[26]: array([0.02266818, 0.01779351, 0.08494914, 0.00303683, 0.05861945,
                0.05858221, 0.06054766, 0.00585816, 0.04014095, 0.
                0.0543034 , 0.12675396, 0.12083748, 0.14386263, 0.0515548
```

, 0.02358964, 0.06362373])

```
localhost:8888/notebooks/Random Forest(Mobile Price).ipynb
```

0.00618813, 0.05709013, 0.

```
In [27]: imp_df = pd.DataFrame({"Vername": x_train.columns,"Imp": rf_best.feature_importances_})
imp_df.sort_values(by="Imp", ascending=False)
```

Out[27]:

	Vername	lmp
13	ram	0.143863
11	px_height	0.126754
12	px_width	0.120837
2	clock_speed	0.084949
19	price_range	0.063624
6	int_memory	0.060548
4	fc	0.058619
5	four <u>g</u>	0.058582
16	talk_time	0.057090
10	рс	0.054303
14	sc_h	0.051555
8	mobile_wt	0.040141
18	touch_screen	0.023590
0	battery_power	0.022668
1	blue	0.017794
15	sc_w	0.006188
7	m_dep	0.005858
3	dual_sim	0.003037
9	n_cores	0.000000
17	three_g	0.000000