In [1]:
```
import pandas as pd
```

In [2]:
```
df_train = pd.read_csv('../Admin/datasets/TITANIC/train.csv')
df_test = pd.read_csv('../Admin/datasets/TITANIC/test.csv')
```

In [3]:
```
X_cols = list(df_train.columns)
y_col  = 'Survived'
```

In [4]:
```
X_cols.remove('Cabin')
X_cols.remove('PassengerId')
X_cols.remove('Survived')
X_cols.remove('Ticket')
X_cols.remove('Name')
```

In [5]:
```
df_train['Age'].fillna(df_train['Age'].median(),inplace=True)
df_test['Age'].fillna(df_train['Age'].median(),inplace=True)

df_train['Embarked'].fillna(df_train['Embarked'].mode()[0],inplace=True)
df_test['Embarked'].fillna(df_train['Embarked'].mode()[0],inplace=True)
```

In [6]:
```
temp = pd.get_dummies(df_train['Embarked'])
df_train = pd.concat([df_train,temp],axis=1)

temp = pd.get_dummies(df_test['Embarked'])
df_test = pd.concat([df_test,temp],axis=1)

X_cols.extend(temp.columns)
```

In [7]:
```
X_cols.remove('Embarked')
```

In [8]:
```
X_cols
```

Out[8]:
```
['Pclass', 'Sex', 'Age', 'SibSp', 'Parch', 'Fare', 'C', 'Q', 'S']
```

In [9]:
```
temp_1 = pd.get_dummies(df_train['Sex'])
df_train = pd.concat([df_train,temp_1],axis=1)

temp_1 = pd.get_dummies(df_test['Sex'])
df_test = pd.concat([df_test,temp_1],axis=1)
```

```
X_cols.extend(temp_1.columns)
```

In [10]:
```
X_cols.remove('Sex')
```

In [11]:
```
X_cols
```

Out[11]:
```
['Pclass', 'Age', 'SibSp', 'Parch', 'Fare', 'C', 'Q', 'S', 'female', 'male']
```

In [12]:
```
X_cols.remove('male')
```

In [13]:
```
X_cols
```

Out[13]:
```
['Pclass', 'Age', 'SibSp', 'Parch', 'Fare', 'C', 'Q', 'S', 'female']
```

In [14]:
```
df_train[X_cols].info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 9 columns):
 #   Column  Non-Null Count  Dtype  
---  ------  --------------  -----  
 0   Pclass  891 non-null    int64  
 1   Age     891 non-null    float64
 2   SibSp   891 non-null    int64  
 3   Parch   891 non-null    int64  
 4   Fare    891 non-null    float64
 5   C       891 non-null    uint8  
 6   Q       891 non-null    uint8  
 7   S       891 non-null    uint8  
 8   female  891 non-null    uint8  
dtypes: float64(2), int64(3), uint8(4)
memory usage: 38.4 KB
```

In [15]:
```
df_test[X_cols].info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 418 entries, 0 to 417
Data columns (total 9 columns):
 #   Column  Non-Null Count  Dtype  
---  ------  --------------  -----  
 0   Pclass  418 non-null    int64  
 1   Age     418 non-null    float64
 2   SibSp   418 non-null    int64  
```

```
 3   Parch   418 non-null    int64
 4   Fare    417 non-null    float64
 5   C       418 non-null    uint8
 6   Q       418 non-null    uint8
 7   S       418 non-null    uint8
 8   female  418 non-null    uint8
dtypes: float64(2), int64(3), uint8(4)
memory usage: 18.1 KB
```

In [16]:
```
df_test['Fare'].fillna(df_train['Fare'].median(),inplace=True)
```

In [17]:
```
df_test[X_cols].isna().sum()
```

Out[17]:
```
Pclass    0
Age       0
SibSp     0
Parch     0
Fare      0
C         0
Q         0
S         0
female    0
dtype: int64
```

In [18]:
```
df_train[X_cols]
```

Out[18]:

| | Pclass | Age | SibSp | Parch | Fare | C | Q | S | female |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 3 | 22.0 | 1 | 0 | 7.2500 | 0 | 0 | 1 | 0 |
| **1** | 1 | 38.0 | 1 | 0 | 71.2833 | 1 | 0 | 0 | 1 |
| **2** | 3 | 26.0 | 0 | 0 | 7.9250 | 0 | 0 | 1 | 1 |
| **3** | 1 | 35.0 | 1 | 0 | 53.1000 | 0 | 0 | 1 | 1 |
| **4** | 3 | 35.0 | 0 | 0 | 8.0500 | 0 | 0 | 1 | 0 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **886** | 2 | 27.0 | 0 | 0 | 13.0000 | 0 | 0 | 1 | 0 |
| **887** | 1 | 19.0 | 0 | 0 | 30.0000 | 0 | 0 | 1 | 1 |
| **888** | 3 | 28.0 | 1 | 2 | 23.4500 | 0 | 0 | 1 | 1 |
| **889** | 1 | 26.0 | 0 | 0 | 30.0000 | 1 | 0 | 0 | 0 |

| | Pclass | Age | SibSp | Parch | Fare | C | Q | S | female |
|---|---|---|---|---|---|---|---|---|---|
| **890** | 3 | 32.0 | 0 | 0 | 7.7500 | 0 | 1 | 0 | 0 |

891 rows × 9 columns

In [19]:
```
def get_agegroup(X):
    if X<20:
        return 'P'
    elif X<40:
        return 'W'
    elif X<60:
        return 'D'
    else:
        return 'Z'
```

In [20]:
```
df_train['Age_Group'] = df_train['Age'].apply(get_agegroup)
df_test['Age_Group'] = df_test['Age'].apply(get_agegroup)
```

In [21]:
```
df_train[['Age','Age_Group']]
```

Out[21]:

| | Age | Age_Group |
|---|---|---|
| **0** | 22.0 | W |
| **1** | 38.0 | W |
| **2** | 26.0 | W |
| **3** | 35.0 | W |
| **4** | 35.0 | W |
| **...** | ... | ... |
| **886** | 27.0 | W |
| **887** | 19.0 | P |
| **888** | 28.0 | W |
| **889** | 26.0 | W |
| **890** | 32.0 | W |

891 rows × 2 columns

In [22]:
```
df_train[X_cols]
```

Out[22]:

| | Pclass | Age | SibSp | Parch | Fare | C | Q | S | female |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 3 | 22.0 | 1 | 0 | 7.2500 | 0 | 0 | 1 | 0 |
| **1** | 1 | 38.0 | 1 | 0 | 71.2833 | 1 | 0 | 0 | 1 |
| **2** | 3 | 26.0 | 0 | 0 | 7.9250 | 0 | 0 | 1 | 1 |
| **3** | 1 | 35.0 | 1 | 0 | 53.1000 | 0 | 0 | 1 | 1 |
| **4** | 3 | 35.0 | 0 | 0 | 8.0500 | 0 | 0 | 1 | 0 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **886** | 2 | 27.0 | 0 | 0 | 13.0000 | 0 | 0 | 1 | 0 |
| **887** | 1 | 19.0 | 0 | 0 | 30.0000 | 0 | 0 | 1 | 1 |
| **888** | 3 | 28.0 | 1 | 2 | 23.4500 | 0 | 0 | 1 | 1 |
| **889** | 1 | 26.0 | 0 | 0 | 30.0000 | 1 | 0 | 0 | 0 |
| **890** | 3 | 32.0 | 0 | 0 | 7.7500 | 0 | 1 | 0 | 0 |

891 rows × 9 columns

In [23]:
```
X_cols = list(df_train.columns)
```

In [24]:
```
X_cols
```

Out[24]:
```
['PassengerId',
 'Survived',
 'Pclass',
 'Name',
 'Sex',
 'Age',
 'SibSp',
 'Parch',
 'Ticket',
 'Fare',
```

```
 'Cabin',
 'Embarked',
 'C',
 'Q',
 'S',
 'female',
 'male',
 'Age_Group']
```

In [25]:
```
X_cols.remove('Cabin')
X_cols.remove('PassengerId')
X_cols.remove('Survived')
X_cols.remove('Ticket')
X_cols.remove('Name')
X_cols.remove('Age')
X_cols.remove('Sex')
X_cols.remove('Embarked')
X_cols.remove('male')
```

In [26]:
```
X_cols
```

Out[26]:
```
['Pclass', 'SibSp', 'Parch', 'Fare', 'C', 'Q', 'S', 'female', 'Age_Group']
```

In [27]:
```
df_train[X_cols].info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 9 columns):
 #   Column     Non-Null Count  Dtype  
---  ------     --------------  -----  
 0   Pclass     891 non-null    int64  
 1   SibSp      891 non-null    int64  
 2   Parch      891 non-null    int64  
 3   Fare       891 non-null    float64
 4   C          891 non-null    uint8  
 5   Q          891 non-null    uint8  
 6   S          891 non-null    uint8  
 7   female     891 non-null    uint8  
 8   Age_Group  891 non-null    object 
dtypes: float64(1), int64(3), object(1), uint8(4)
memory usage: 38.4+ KB
```

In [28]:
```
df_test[X_cols].info()
```

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

```
RangeIndex: 418 entries, 0 to 417
Data columns (total 9 columns):
 #   Column     Non-Null Count  Dtype
---  ------     --------------  -----
 0   Pclass     418 non-null    int64
 1   SibSp      418 non-null    int64
 2   Parch      418 non-null    int64
 3   Fare       418 non-null    float64
 4   C          418 non-null    uint8
 5   Q          418 non-null    uint8
 6   S          418 non-null    uint8
 7   female     418 non-null    uint8
 8   Age_Group  418 non-null    object
dtypes: float64(1), int64(3), object(1), uint8(4)
memory usage: 18.1+ KB
```

In [29]:
```
temp_4 = pd.get_dummies(df_train['Age_Group'])
df_train = pd.concat([df_train,temp_4],axis=1)

temp_4 = pd.get_dummies(df_test['Age_Group'])
df_test = pd.concat([df_test,temp_4],axis=1)

X_cols.extend(temp_4.columns)
```

In [30]:
```
X_cols
```

Out[30]:
```
['Pclass',
 'SibSp',
 'Parch',
 'Fare',
 'C',
 'Q',
 'S',
 'female',
 'Age_Group',
 'D',
 'P',
 'W',
 'Z']
```

In [31]:
```
 df_train[X_cols].info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 13 columns):
 #   Column     Non-Null Count  Dtype
```

```
---  ------     --------------  -----
 0   Pclass     891 non-null    int64
 1   SibSp      891 non-null    int64
 2   Parch      891 non-null    int64
 3   Fare       891 non-null    float64
 4   C          891 non-null    uint8
 5   Q          891 non-null    uint8
 6   S          891 non-null    uint8
 7   female     891 non-null    uint8
 8   Age_Group  891 non-null    object
 9   D          891 non-null    uint8
 10  P          891 non-null    uint8
 11  W          891 non-null    uint8
 12  Z          891 non-null    uint8
dtypes: float64(1), int64(3), object(1), uint8(8)
memory usage: 41.9+ KB
```

In [32]:
```
df_test[X_cols].info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 418 entries, 0 to 417
Data columns (total 13 columns):
 #   Column     Non-Null Count  Dtype
---  ------     --------------  -----
 0   Pclass     418 non-null    int64
 1   SibSp      418 non-null    int64
 2   Parch      418 non-null    int64
 3   Fare       418 non-null    float64
 4   C          418 non-null    uint8
 5   Q          418 non-null    uint8
 6   S          418 non-null    uint8
 7   female     418 non-null    uint8
 8   Age_Group  418 non-null    object
 9   D          418 non-null    uint8
 10  P          418 non-null    uint8
 11  W          418 non-null    uint8
 12  Z          418 non-null    uint8
dtypes: float64(1), int64(3), object(1), uint8(8)
memory usage: 19.7+ KB
```

In [33]:
```
X_cols.remove('Age_Group')
```

In [34]:
```
X_cols
```

Out[34]:
```
['Pclass',
 'SibSp',
```

```
 'Parch',
 'Fare',
 'C',
 'Q',
 'S',
 'female',
 'D',
 'P',
 'W',
 'Z']
```

In [35]:
```
df_train[X_cols].info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 12 columns):
 #   Column  Non-Null Count  Dtype  
---  ------  --------------  -----  
 0   Pclass  891 non-null    int64  
 1   SibSp   891 non-null    int64  
 2   Parch   891 non-null    int64  
 3   Fare    891 non-null    float64
 4   C       891 non-null    uint8  
 5   Q       891 non-null    uint8  
 6   S       891 non-null    uint8  
 7   female  891 non-null    uint8  
 8   D       891 non-null    uint8  
 9   P       891 non-null    uint8  
 10  W       891 non-null    uint8  
 11  Z       891 non-null    uint8  
dtypes: float64(1), int64(3), uint8(8)
memory usage: 34.9 KB
```

In [36]:
```
df_test[X_cols].info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 418 entries, 0 to 417
Data columns (total 12 columns):
 #   Column  Non-Null Count  Dtype  
---  ------  --------------  -----  
 0   Pclass  418 non-null    int64  
 1   SibSp   418 non-null    int64  
 2   Parch   418 non-null    int64  
 3   Fare    418 non-null    float64
 4   C       418 non-null    uint8  
 5   Q       418 non-null    uint8  
 6   S       418 non-null    uint8  
```

```
 7   female  418 non-null    uint8
 8   D       418 non-null    uint8
 9   P       418 non-null    uint8
 10  W       418 non-null    uint8
 11  Z       418 non-null    uint8
dtypes: float64(1), int64(3), uint8(8)
memory usage: 16.5 KB
```

# Build ML mode

# 1. Using RandomForest

In [41]:
```
X = df_train[X_cols]
y = df_train[y_col]
```

In [42]:
```
from sklearn.model_selection import train_test_split
X_train, X_val, y_train, y_val=train_test_split(X,y,test_size=0.25,random_state=96)
```

In [43]:
```
X_train.shape,X_val.shape
```

Out[43]:
```
((668, 12), (223, 12))
```

In [47]:
```
from sklearn.ensemble import RandomForestClassifier
```

In [76]:
```
model = RandomForestClassifier(random_state=10)
model.fit(X_train,y_train)
model.score(X_val,y_val)
```

Out[76]:
```
0.7982062780269058
```

In [77]:
```
y_pre = model.predict(df_test[X_cols])
```

In [78]:
```
df_test['Survived'] = y_pre
```

In [79]:
```
 df_test[['PassengerId','Survived']]
```

Out[79]:

| | PassengerId | Survived |
|---|---|---|

| | PassengerId | Survived |
|---|---|---|
| **0** | 892 | 0 |
| **1** | 893 | 0 |
| **2** | 894 | 0 |
| **3** | 895 | 0 |
| **4** | 896 | 0 |
| **...** | ... | ... |
| **413** | 1305 | 0 |
| **414** | 1306 | 1 |
| **415** | 1307 | 0 |
| **416** | 1308 | 0 |
| **417** | 1309 | 1 |

418 rows × 2 columns

In [80]:
```
df_test[['PassengerId','Survived']].to_csv('sub01.csv', index=False)
```

In [81]:
```
from sklearn.model_selection import GridSearchCV
```

In [82]:
```
params = {'max_depth':[2,3,4,5],
          'min_samples_leaf':[3,4,5,6],
           'n_estimators':[10,15,20,30,40,50,100,150]}
```

In [83]:
```
grid_cv = GridSearchCV(RandomForestClassifier(),params,cv=5,verbose=3)
```

In [84]:
```
grid_cv.fit(X_train,y_train)
```

```
Fitting 5 folds for each of 128 candidates, totalling 640 fits
[CV] max_depth=2, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=10, score=0.799, total=   0.0s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=10, score=0.761, total=   0.0s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=10 ................
```

```
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=10, score=0.731, total=   0.0s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=10, score=0.782, total=   0.0s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=10, score=0.767, total=   0.0s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=15 ................
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
[Parallel(n_jobs=1)]: Done   1 out of   1 | elapsed:    0.0s remaining:    0.0s
[Parallel(n_jobs=1)]: Done   2 out of   2 | elapsed:    0.0s remaining:    0.0s
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=15, score=0.784, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=15, score=0.731, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=15, score=0.746, total=   0.0s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=15, score=0.744, total=   0.0s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=15, score=0.835, total=   0.0s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=20, score=0.784, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=20, score=0.769, total=   0.0s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=20, score=0.754, total=   0.0s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=20, score=0.752, total=   0.0s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=20, score=0.812, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=30, score=0.806, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=30, score=0.769, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=30, score=0.731, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=30, score=0.759, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=30, score=0.820, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=40, score=0.776, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=40, score=0.776, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=40, score=0.716, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=40, score=0.782, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=40 ................
```

```
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=40, score=0.820, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=50, score=0.784, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=50, score=0.746, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=50, score=0.724, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=50, score=0.767, total=   0.1s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=50, score=0.827, total=   0.2s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=100, score=0.784, total=   0.3s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=100, score=0.784, total=   0.3s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=100, score=0.754, total=   0.3s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=100, score=0.767, total=   0.3s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=100, score=0.827, total=   0.3s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=150, score=0.799, total=   0.5s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=150, score=0.784, total=   0.4s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=150, score=0.754, total=   0.4s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=150, score=0.759, total=   0.3s
[CV] max_depth=2, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=3, n_estimators=150, score=0.842, total=   0.4s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=10, score=0.799, total=   0.0s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=10, score=0.761, total=   0.0s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=10, score=0.709, total=   0.0s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=10, score=0.812, total=   0.0s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=10, score=0.699, total=   0.0s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=15, score=0.836, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=15, score=0.776, total=   0.0s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=15, score=0.754, total=   0.0s
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[CV] max_depth=2, min_samples_leaf=4, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=15, score=0.797, total=   0.0s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=15, score=0.797, total=   0.0s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=20, score=0.791, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=20, score=0.784, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=20, score=0.769, total=   0.0s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=20, score=0.759, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=20, score=0.850, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=30, score=0.784, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=30, score=0.754, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=30, score=0.746, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=30, score=0.782, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=30, score=0.789, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=40, score=0.791, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=40, score=0.821, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=40, score=0.754, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=40, score=0.782, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=40, score=0.842, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=50, score=0.784, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=50, score=0.769, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=50, score=0.746, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=50, score=0.782, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=50, score=0.827, total=   0.1s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=100, score=0.799, total=   0.3s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=100 ...............
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[CV]  max_depth=2, min_samples_leaf=4, n_estimators=100, score=0.776, total=   0.3s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=100, score=0.716, total=   0.3s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=100, score=0.767, total=   0.3s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=100, score=0.820, total=   0.3s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=150, score=0.776, total=   0.4s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=150, score=0.784, total=   0.4s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=150, score=0.754, total=   0.4s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=150, score=0.759, total=   0.4s
[CV] max_depth=2, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=4, n_estimators=150, score=0.820, total=   0.4s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=10, score=0.791, total=   0.0s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=10, score=0.776, total=   0.0s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=10, score=0.731, total=   0.0s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=10, score=0.797, total=   0.0s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=10, score=0.744, total=   0.0s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=15, score=0.799, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=15, score=0.776, total=   0.0s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=15, score=0.739, total=   0.0s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=15, score=0.789, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=15, score=0.842, total=   0.0s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=20, score=0.821, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=20, score=0.769, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=20, score=0.746, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=20, score=0.729, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=20, score=0.774, total=   0.1s
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[CV] max_depth=2, min_samples_leaf=5, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=30, score=0.776, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=30, score=0.791, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=30, score=0.739, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=30, score=0.759, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=30, score=0.827, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=40, score=0.791, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=40, score=0.769, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=40, score=0.776, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=40, score=0.774, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=40, score=0.789, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=50, score=0.799, total=   0.2s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=50, score=0.746, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=50, score=0.739, total=   0.2s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=50, score=0.774, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=50, score=0.812, total=   0.1s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=100, score=0.791, total=   0.2s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=100, score=0.776, total=   0.2s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=100, score=0.761, total=   0.3s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=100, score=0.782, total=   0.3s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=100, score=0.789, total=   0.3s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=150, score=0.791, total=   0.4s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=150, score=0.791, total=   0.5s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=150, score=0.746, total=   0.5s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=150 ...............
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[CV]  max_depth=2, min_samples_leaf=5, n_estimators=150, score=0.759, total=   0.4s
[CV] max_depth=2, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=5, n_estimators=150, score=0.842, total=   0.5s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=10, score=0.791, total=   0.0s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=10, score=0.776, total=   0.0s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=10, score=0.709, total=   0.0s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=10, score=0.789, total=   0.0s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=10, score=0.812, total=   0.0s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=15, score=0.784, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=15, score=0.776, total=   0.0s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=15, score=0.731, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=15, score=0.767, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=15, score=0.767, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=20, score=0.791, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=20, score=0.776, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=20, score=0.776, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=20, score=0.789, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=20, score=0.774, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=30, score=0.784, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=30, score=0.754, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=30, score=0.754, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=30, score=0.782, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=30, score=0.782, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=40, score=0.784, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=40, score=0.776, total=   0.1s
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[CV] max_depth=2, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=40, score=0.754, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=40, score=0.774, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=40, score=0.797, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=50, score=0.769, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=50, score=0.791, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=50, score=0.724, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=50, score=0.759, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=50, score=0.842, total=   0.1s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=100, score=0.791, total=   0.3s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=100, score=0.776, total=   0.3s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=100, score=0.731, total=   0.3s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=100, score=0.789, total=   0.2s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=100, score=0.805, total=   0.3s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=150, score=0.784, total=   0.4s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=150, score=0.791, total=   0.5s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=150, score=0.754, total=   0.5s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=150, score=0.767, total=   0.5s
[CV] max_depth=2, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=2, min_samples_leaf=6, n_estimators=150, score=0.835, total=   0.4s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=10, score=0.799, total=   0.0s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=10, score=0.769, total=   0.0s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=10, score=0.791, total=   0.0s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=10, score=0.820, total=   0.0s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=10, score=0.805, total=   0.0s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=15 ................
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[CV]  max_depth=3, min_samples_leaf=3, n_estimators=15, score=0.799, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=15, score=0.754, total=   0.0s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=15, score=0.701, total=   0.0s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=15, score=0.797, total=   0.0s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=15, score=0.865, total=   0.0s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=20, score=0.821, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=20, score=0.806, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=20, score=0.739, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=20, score=0.805, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=20, score=0.797, total=   0.0s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=30, score=0.821, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=30, score=0.761, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=30, score=0.776, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=30, score=0.774, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=30, score=0.789, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=40, score=0.813, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=40, score=0.776, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=40, score=0.776, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=40, score=0.774, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=40, score=0.827, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=50, score=0.821, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=50, score=0.821, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=50, score=0.776, total=   0.2s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=50, score=0.767, total=   0.1s
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[CV] max_depth=3, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=50, score=0.835, total=   0.1s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=100, score=0.806, total=   0.3s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=100, score=0.799, total=   0.2s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=100, score=0.776, total=   0.2s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=100, score=0.782, total=   0.3s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=100, score=0.812, total=   0.3s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=150, score=0.791, total=   0.4s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=150, score=0.799, total=   0.4s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=150, score=0.776, total=   0.3s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=150, score=0.805, total=   0.4s
[CV] max_depth=3, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=3, n_estimators=150, score=0.842, total=   0.3s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=10 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=10, score=0.806, total=   0.0s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=10 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=10, score=0.769, total=   0.0s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=10 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=10, score=0.754, total=   0.0s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=10 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=10, score=0.767, total=   0.0s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=10 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=10, score=0.767, total=   0.0s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=15 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=15, score=0.799, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=15 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=15, score=0.746, total=   0.0s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=15 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=15, score=0.739, total=   0.0s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=15 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=15, score=0.812, total=   0.0s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=15 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=15, score=0.857, total=   0.0s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=20 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=20, score=0.813, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=20 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=20, score=0.776, total=   0.0s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=20 ................
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[CV]  max_depth=3, min_samples_leaf=4, n_estimators=20, score=0.791, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=20 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=20, score=0.767, total=   0.0s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=20 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=20, score=0.789, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=30 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=30, score=0.799, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=30 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=30, score=0.784, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=30 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=30, score=0.799, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=30 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=30, score=0.797, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=30 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=30, score=0.812, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=40, score=0.813, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=40, score=0.776, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=40, score=0.769, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=40, score=0.805, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=40, score=0.842, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=50, score=0.799, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=50, score=0.776, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=50, score=0.784, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=50, score=0.789, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=50, score=0.827, total=   0.1s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=100, score=0.791, total=   0.2s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=100, score=0.791, total=   0.2s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=100, score=0.769, total=   0.2s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=100, score=0.797, total=   0.2s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=100, score=0.820, total=   0.2s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=150, score=0.799, total=   0.3s
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[CV] max_depth=3, min_samples_leaf=4, n_estimators=150 ..............
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=150, score=0.791, total=   0.3s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=150 ..............
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=150, score=0.769, total=   0.4s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=150 ..............
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=150, score=0.797, total=   0.3s
[CV] max_depth=3, min_samples_leaf=4, n_estimators=150 ..............
[CV]  max_depth=3, min_samples_leaf=4, n_estimators=150, score=0.820, total=   0.3s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=10 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=10, score=0.784, total=   0.0s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=10 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=10, score=0.761, total=   0.0s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=10 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=10, score=0.739, total=   0.0s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=10 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=10, score=0.797, total=   0.0s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=10 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=10, score=0.789, total=   0.0s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=15 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=15, score=0.791, total=   0.0s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=15 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=15, score=0.799, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=15 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=15, score=0.776, total=   0.0s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=15 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=15, score=0.767, total=   0.0s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=15 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=15, score=0.827, total=   0.0s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=20 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=20, score=0.806, total=   0.0s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=20 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=20, score=0.769, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=20 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=20, score=0.791, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=20 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=20, score=0.774, total=   0.0s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=20 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=20, score=0.782, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=30 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=30, score=0.828, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=30 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=30, score=0.776, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=30 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=30, score=0.784, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=30 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=30, score=0.797, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=30 ...............
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[CV]  max_depth=3, min_samples_leaf=5, n_estimators=30, score=0.827, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=40, score=0.828, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=40, score=0.813, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=40, score=0.776, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=40, score=0.789, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=40, score=0.797, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=50, score=0.799, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=50, score=0.799, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=50, score=0.776, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=50, score=0.774, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=50, score=0.789, total=   0.1s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=100, score=0.828, total=   0.2s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=100, score=0.791, total=   0.3s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=100, score=0.776, total=   0.2s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=100, score=0.797, total=   0.2s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=100, score=0.812, total=   0.2s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=150, score=0.799, total=   0.3s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=150, score=0.806, total=   0.3s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=150, score=0.769, total=   0.4s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=150, score=0.797, total=   0.4s
[CV] max_depth=3, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=5, n_estimators=150, score=0.835, total=   0.3s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=10, score=0.784, total=   0.0s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=10, score=0.799, total=   0.0s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=10, score=0.754, total=   0.0s
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[CV] max_depth=3, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=10, score=0.797, total=   0.0s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=10, score=0.797, total=   0.0s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=15, score=0.813, total=   0.0s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=15, score=0.784, total=   0.0s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=15, score=0.799, total=   0.0s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=15, score=0.805, total=   0.0s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=15, score=0.797, total=   0.0s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=20, score=0.791, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=20, score=0.776, total=   0.0s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=20, score=0.746, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=20, score=0.797, total=   0.0s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=20, score=0.797, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=30, score=0.813, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=30, score=0.799, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=30, score=0.761, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=30, score=0.774, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=30, score=0.812, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=40, score=0.821, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=40, score=0.799, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=40, score=0.769, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=40, score=0.782, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=40, score=0.797, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=50, score=0.821, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=50 ................
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[CV]  max_depth=3, min_samples_leaf=6, n_estimators=50, score=0.806, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=50, score=0.776, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=50, score=0.805, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=50, score=0.835, total=   0.1s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=100, score=0.806, total=   0.2s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=100, score=0.806, total=   0.2s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=100, score=0.776, total=   0.2s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=100, score=0.774, total=   0.2s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=100, score=0.820, total=   0.2s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=150, score=0.813, total=   0.3s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=150, score=0.799, total=   0.4s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=150, score=0.776, total=   0.3s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=150, score=0.797, total=   0.3s
[CV] max_depth=3, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=3, min_samples_leaf=6, n_estimators=150, score=0.827, total=   0.3s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=10, score=0.821, total=   0.0s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=10, score=0.784, total=   0.0s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=10, score=0.776, total=   0.0s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=10, score=0.789, total=   0.0s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=10, score=0.774, total=   0.0s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=15, score=0.813, total=   0.1s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=15, score=0.761, total=   0.0s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=15, score=0.776, total=   0.0s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=15, score=0.805, total=   0.0s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=15, score=0.805, total=   0.0s
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[CV] max_depth=4, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=20, score=0.806, total=   0.1s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=20, score=0.813, total=   0.1s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=20, score=0.776, total=   0.0s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=20, score=0.797, total=   0.1s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=20, score=0.805, total=   0.1s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=30, score=0.799, total=   0.1s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=30, score=0.813, total=   0.1s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=30, score=0.776, total=   0.1s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=30, score=0.797, total=   0.1s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=30, score=0.812, total=   0.1s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=40, score=0.821, total=   0.2s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=40, score=0.806, total=   0.1s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=40, score=0.784, total=   0.1s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=40, score=0.805, total=   0.2s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=40, score=0.835, total=   0.2s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=50, score=0.828, total=   0.2s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=50, score=0.769, total=   0.1s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=50, score=0.776, total=   0.1s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=50, score=0.805, total=   0.1s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=50, score=0.820, total=   0.2s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=100, score=0.821, total=   0.3s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=100, score=0.813, total=   0.3s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=100, score=0.776, total=   0.3s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=100 ...............
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[CV]  max_depth=4, min_samples_leaf=3, n_estimators=100, score=0.805, total=   0.2s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=100, score=0.835, total=   0.3s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=150, score=0.813, total=   0.4s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=150, score=0.799, total=   0.4s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=150, score=0.769, total=   0.4s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=150, score=0.797, total=   0.5s
[CV] max_depth=4, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=3, n_estimators=150, score=0.842, total=   0.4s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=10, score=0.813, total=   0.0s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=10, score=0.806, total=   0.0s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=10, score=0.784, total=   0.0s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=10, score=0.782, total=   0.0s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=10, score=0.820, total=   0.0s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=15, score=0.784, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=15, score=0.769, total=   0.0s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=15, score=0.769, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=15, score=0.820, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=15, score=0.820, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=20, score=0.813, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=20, score=0.776, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=20, score=0.746, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=20, score=0.797, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=20, score=0.805, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=30, score=0.836, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=30, score=0.776, total=   0.1s
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[CV] max_depth=4, min_samples_leaf=4, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=30, score=0.784, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=30, score=0.805, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=30, score=0.805, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=40, score=0.799, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=40, score=0.799, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=40, score=0.769, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=40, score=0.797, total=   0.2s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=40, score=0.842, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=50, score=0.821, total=   0.2s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=50, score=0.799, total=   0.2s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=50, score=0.776, total=   0.2s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=50, score=0.789, total=   0.1s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=50, score=0.820, total=   0.2s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=100, score=0.821, total=   0.3s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=100, score=0.791, total=   0.3s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=100, score=0.769, total=   0.3s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=100, score=0.805, total=   0.3s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=100, score=0.812, total=   0.3s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=150, score=0.821, total=   0.4s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=150, score=0.799, total=   0.4s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=150, score=0.776, total=   0.4s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=150, score=0.797, total=   0.4s
[CV] max_depth=4, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=4, n_estimators=150, score=0.835, total=   0.4s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=10 ................
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[CV]  max_depth=4, min_samples_leaf=5, n_estimators=10, score=0.821, total=   0.0s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=10, score=0.739, total=   0.0s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=10, score=0.754, total=   0.0s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=10, score=0.805, total=   0.0s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=10, score=0.835, total=   0.0s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=15, score=0.799, total=   0.1s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=15, score=0.799, total=   0.1s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=15, score=0.784, total=   0.0s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=15, score=0.759, total=   0.1s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=15, score=0.835, total=   0.0s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=20, score=0.791, total=   0.1s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=20, score=0.791, total=   0.1s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=20, score=0.754, total=   0.1s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=20, score=0.789, total=   0.1s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=20, score=0.782, total=   0.1s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=30, score=0.821, total=   0.1s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=30, score=0.784, total=   0.1s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=30, score=0.754, total=   0.1s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=30, score=0.820, total=   0.1s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=30, score=0.835, total=   0.1s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=40, score=0.806, total=   0.1s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=40, score=0.799, total=   0.2s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=40, score=0.746, total=   0.1s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=40, score=0.789, total=   0.2s
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[CV] max_depth=4, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=40, score=0.812, total=   0.2s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=50, score=0.821, total=   0.2s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=50, score=0.784, total=   0.2s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=50, score=0.784, total=   0.2s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=50, score=0.805, total=   0.2s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=50, score=0.835, total=   0.2s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=100, score=0.799, total=   0.4s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=100, score=0.776, total=   0.3s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=100, score=0.776, total=   0.3s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=100, score=0.797, total=   0.3s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=100, score=0.820, total=   0.3s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=150, score=0.828, total=   0.4s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=150, score=0.791, total=   0.4s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=150, score=0.761, total=   0.4s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=150, score=0.805, total=   0.4s
[CV] max_depth=4, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=5, n_estimators=150, score=0.842, total=   0.5s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=10, score=0.799, total=   0.0s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=10, score=0.799, total=   0.0s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=10, score=0.776, total=   0.0s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=10, score=0.797, total=   0.0s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=10, score=0.827, total=   0.0s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=15, score=0.836, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=15, score=0.776, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=15 ................
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[CV]  max_depth=4, min_samples_leaf=6, n_estimators=15, score=0.769, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=15, score=0.789, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=15, score=0.835, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=20, score=0.828, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=20, score=0.791, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=20, score=0.776, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=20, score=0.797, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=20, score=0.797, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=30, score=0.813, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=30, score=0.769, total=   0.2s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=30, score=0.754, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=30, score=0.797, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=30, score=0.827, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=40, score=0.813, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=40, score=0.784, total=   0.2s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=40, score=0.761, total=   0.2s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=40, score=0.782, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=40, score=0.797, total=   0.2s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=50, score=0.813, total=   0.2s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=50, score=0.806, total=   0.2s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=50, score=0.761, total=   0.2s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=50, score=0.789, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=50, score=0.805, total=   0.1s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=100, score=0.821, total=   0.3s
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[CV] max_depth=4, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=100, score=0.806, total=   0.2s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=100, score=0.776, total=   0.2s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=100, score=0.789, total=   0.2s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=100, score=0.842, total=   0.2s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=150, score=0.813, total=   0.4s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=150, score=0.813, total=   0.3s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=150, score=0.776, total=   0.3s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=150, score=0.789, total=   0.4s
[CV] max_depth=4, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=4, min_samples_leaf=6, n_estimators=150, score=0.827, total=   0.4s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=10, score=0.813, total=   0.0s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=10, score=0.761, total=   0.0s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=10, score=0.776, total=   0.0s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=10, score=0.797, total=   0.0s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=10 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=10, score=0.782, total=   0.0s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=15, score=0.828, total=   0.0s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=15, score=0.784, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=15, score=0.776, total=   0.0s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=15, score=0.812, total=   0.0s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=15 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=15, score=0.797, total=   0.0s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=20, score=0.821, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=20, score=0.784, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=20, score=0.791, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=20 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=20, score=0.805, total=   0.0s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=20 ................
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[CV]  max_depth=5, min_samples_leaf=3, n_estimators=20, score=0.812, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=30, score=0.828, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=30, score=0.776, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=30, score=0.769, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=30, score=0.789, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=30 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=30, score=0.857, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=40, score=0.799, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=40, score=0.799, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=40, score=0.813, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=40, score=0.797, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=40, score=0.812, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=50, score=0.828, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=50, score=0.791, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=50, score=0.769, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=50, score=0.797, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=50, score=0.835, total=   0.1s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=100, score=0.821, total=   0.3s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=100, score=0.806, total=   0.2s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=100, score=0.791, total=   0.2s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=100, score=0.797, total=   0.3s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=100, score=0.835, total=   0.2s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=150, score=0.828, total=   0.4s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=150, score=0.806, total=   0.4s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=150, score=0.806, total=   0.4s
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[CV] max_depth=5, min_samples_leaf=3, n_estimators=150 ..............
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=150, score=0.805, total=   0.4s
[CV] max_depth=5, min_samples_leaf=3, n_estimators=150 ..............
[CV]  max_depth=5, min_samples_leaf=3, n_estimators=150, score=0.850, total=   0.4s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=10 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=10, score=0.806, total=   0.0s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=10 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=10, score=0.746, total=   0.0s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=10 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=10, score=0.821, total=   0.0s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=10 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=10, score=0.782, total=   0.0s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=10 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=10, score=0.857, total=   0.0s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=15 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=15, score=0.806, total=   0.0s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=15 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=15, score=0.784, total=   0.0s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=15 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=15, score=0.799, total=   0.0s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=15 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=15, score=0.797, total=   0.0s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=15 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=15, score=0.812, total=   0.0s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=20 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=20, score=0.813, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=20 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=20, score=0.799, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=20 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=20, score=0.754, total=   0.0s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=20 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=20, score=0.797, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=20 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=20, score=0.805, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=30 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=30, score=0.828, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=30 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=30, score=0.791, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=30 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=30, score=0.784, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=30 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=30, score=0.789, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=30 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=30, score=0.805, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=40 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=40, score=0.784, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=40 ...............
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[CV]  max_depth=5, min_samples_leaf=4, n_estimators=40, score=0.776, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=40, score=0.791, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=40, score=0.797, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=40, score=0.820, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=50, score=0.813, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=50, score=0.806, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=50, score=0.791, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=50, score=0.797, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=50, score=0.820, total=   0.1s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=100, score=0.821, total=   0.3s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=100, score=0.799, total=   0.2s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=100, score=0.806, total=   0.2s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=100, score=0.805, total=   0.2s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=100, score=0.835, total=   0.3s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=150, score=0.828, total=   0.4s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=150, score=0.791, total=   0.4s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=150, score=0.769, total=   0.4s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=150, score=0.797, total=   0.3s
[CV] max_depth=5, min_samples_leaf=4, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=4, n_estimators=150, score=0.820, total=   0.3s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=10 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=10, score=0.806, total=   0.0s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=10 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=10, score=0.761, total=   0.0s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=10 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=10, score=0.754, total=   0.0s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=10 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=10, score=0.827, total=   0.0s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=10 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=10, score=0.805, total=   0.0s
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[CV] max_depth=5, min_samples_leaf=5, n_estimators=15 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=15, score=0.791, total=   0.0s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=15 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=15, score=0.791, total=   0.0s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=15 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=15, score=0.784, total=   0.0s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=15 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=15, score=0.759, total=   0.0s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=15 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=15, score=0.812, total=   0.0s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=20 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=20, score=0.836, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=20 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=20, score=0.761, total=   0.0s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=20 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=20, score=0.784, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=20 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=20, score=0.827, total=   0.0s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=20 ................
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[CV] max_depth=5, min_samples_leaf=5, n_estimators=30 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=30, score=0.821, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=30 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=30, score=0.776, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=30 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=30, score=0.791, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=30 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=30, score=0.797, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=30 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=30, score=0.827, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=40, score=0.836, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=40, score=0.791, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=40, score=0.769, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=40, score=0.805, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=40, score=0.820, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=50, score=0.806, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=50, score=0.806, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=50, score=0.799, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=50 ................
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[CV]  max_depth=5, min_samples_leaf=5, n_estimators=50, score=0.797, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=50, score=0.820, total=   0.1s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=100, score=0.821, total=   0.2s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=100, score=0.776, total=   0.2s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=100, score=0.776, total=   0.2s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=100, score=0.805, total=   0.3s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=100, score=0.827, total=   0.2s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=150, score=0.828, total=   0.4s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=150, score=0.799, total=   0.4s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=150, score=0.776, total=   0.3s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=150, score=0.812, total=   0.4s
[CV] max_depth=5, min_samples_leaf=5, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=5, n_estimators=150, score=0.835, total=   0.4s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=10, score=0.821, total=   0.0s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=10, score=0.776, total=   0.0s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=10, score=0.806, total=   0.0s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=10, score=0.789, total=   0.0s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=10 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=10, score=0.820, total=   0.0s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=15, score=0.813, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=15, score=0.761, total=   0.0s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=15, score=0.813, total=   0.0s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=15, score=0.789, total=   0.0s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=15 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=15, score=0.827, total=   0.0s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=20, score=0.806, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=20, score=0.784, total=   0.0s
```

```
[CV] max_depth=5, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=20, score=0.791, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=20, score=0.789, total=   0.0s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=20 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=20, score=0.850, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=30, score=0.821, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=30, score=0.791, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=30, score=0.776, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=30, score=0.797, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=30 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=30, score=0.820, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=40, score=0.836, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=40, score=0.799, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=40, score=0.784, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=40, score=0.797, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=40 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=40, score=0.827, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=50, score=0.821, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=50, score=0.813, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=50, score=0.776, total=   0.1s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=50, score=0.797, total=   0.2s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=50 ................
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=50, score=0.842, total=   0.2s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=100, score=0.821, total=   0.3s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=100, score=0.791, total=   0.3s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=100, score=0.754, total=   0.3s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=100, score=0.805, total=   0.3s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=100 ...............
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=100, score=0.812, total=   0.4s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=150 ...............
```

```
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=150, score=0.828, total=   0.5s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=150, score=0.776, total=   0.5s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=150, score=0.791, total=   0.5s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=150, score=0.805, total=   0.5s
[CV] max_depth=5, min_samples_leaf=6, n_estimators=150 ...............
[CV]  max_depth=5, min_samples_leaf=6, n_estimators=150, score=0.820, total=   0.5s
[Parallel(n_jobs=1)]: Done 640 out of 640 | elapsed:  1.6min finished
```

Out[84]:
```
GridSearchCV(cv=5, estimator=RandomForestClassifier(),
             param_grid={'max_depth': [2, 3, 4, 5],
                         'min_samples_leaf': [3, 4, 5, 6],
                         'n_estimators': [10, 15, 20, 30, 40, 50, 100, 150]},
             verbose=3)
```

In [85]:
```
grid_cv.best_params_
```

Out[85]:
```
{'max_depth': 5, 'min_samples_leaf': 3, 'n_estimators': 150}
```

In [87]:
```
model_01 = RandomForestClassifier(max_depth=5,min_samples_leaf=6,n_estimators=150)
```

In [88]:
```
model_01.fit(X_train,y_train)
```

Out[88]:
```
RandomForestClassifier(max_depth=5, min_samples_leaf=6, n_estimators=150)
```

In [89]:
```
model_01.score(X_val,y_val)
```

Out[89]:
```
0.820627802690583
```

In [101…
```
model_01_final = RandomForestClassifier(max_depth=5,min_samples_leaf=6,n_estimators=150,random_state=10)
model_01_final.fit(X,y)
model_01_final.score(X_val,y_val)
```

Out[101…
```
0.8475336322869955
```

In [104…
```
y_pre = model_01_final.predict(df_test[X_cols])
```

In [105…
```
y_pre
```

Out[105…
```
array([0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 0, 0, 1, 0, 1, 1, 0, 0, 0, 1, 0, 0,
       1, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1,
```

```
 1, 0, 0, 0, 1, 1, 0, 0, 1, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 1,
 1, 0, 0, 1, 1, 0, 0, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0,
 1, 1, 1, 0, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0,
 0, 1, 1, 1, 1, 0, 0, 1, 0, 1, 1, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0,
 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 1,
 0, 0, 1, 0, 0, 1, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1,
 1, 1, 1, 1, 0, 1, 1, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0,
 0, 0, 1, 0, 1, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 1, 0, 0, 1, 0, 1, 0,
 1, 0, 1, 0, 1, 1, 0, 1, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0, 1, 1, 1, 1,
 0, 0, 0, 0, 1, 0, 1, 1, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 1,
 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 1, 0, 0, 0, 0, 0, 0, 1, 1, 1, 0,
 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0,
 0, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0,
 1, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 1, 1, 0,
 0, 0, 1, 0, 1, 0, 0, 1, 0, 1, 1, 0, 1, 0, 0, 1, 1, 0, 0, 1, 0, 0,
 1, 1, 0, 0, 0, 0, 0, 0, 1, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1,
 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 1, 1, 1, 0, 0, 1, 0, 0, 0],
dtype=int64)
```

In [106…]
```
df_test.shape
```

Out[106…]
```
(418, 22)
```

In [107…]
```
df_test['Survived'] = y_pre
```

In [108…]
```
df_test[['PassengerId','Survived']]
```

Out[108…]

| | PassengerId | Survived |
|---|---|---|
| **0** | 892 | 0 |
| **1** | 893 | 0 |
| **2** | 894 | 0 |
| **3** | 895 | 0 |
| **4** | 896 | 1 |
| **...** | ... | ... |
| **413** | 1305 | 0 |
| **414** | 1306 | 1 |
| **415** | 1307 | 0 |

| | PassengerId | Survived |
|---|---|---|
| **416** | 1308 | 0 |
| **417** | 1309 | 0 |

418 rows × 2 columns

In [109…
```
df_test[['PassengerId','Survived']].to_csv('sub03.csv', index=False)
```

In [ ]:
```
```

# Using Xgboost Classifier

In [53]:
```
from xgboost import XGBClassifier
```

In [56]:
```
model_1 = XGBClassifier(n_estimators=30, min_samples_leaf=2, max_depth=4, random_state=10)
model_1.fit(X_train,y_train)
model_1.score(X_val,y_val)
```

```
[15:50:16] WARNING: ..\src\learner.cc:541:
Parameters: { min_samples_leaf } might not be used.

  This may not be accurate due to some parameters are only used in language bindings but
  passed down to XGBoost core.  Or some parameters are not used but slip through this
  verification. Please open an issue if you find above cases.


[15:50:16] WARNING: ..\src\learner.cc:1061: Starting in XGBoost 1.3.0, the default evaluation metric used with the objective 'bina
ry:logistic' was changed from 'error' to 'logloss'. Explicitly set eval_metric if you'd like to restore the old behavior.
```

Out[56]:
```
0.8161434977578476
```

In [91]:
```
model_1_final = XGBClassifier(n_estimators=30, min_samples_leaf=2, max_depth=4, random_state=10)
model_1_final.fit(X,y)
model_1_final.score(X_val,y_val)
```

```
[16:33:08] WARNING: ..\src\learner.cc:541:
Parameters: { min_samples_leaf } might not be used.

  This may not be accurate due to some parameters are only used in language bindings but
  passed down to XGBoost core.  Or some parameters are not used but slip through this
```

```
  verification. Please open an issue if you find above cases.


[16:33:08] WARNING: ..\src\learner.cc:1061: Starting in XGBoost 1.3.0, the default evaluation metric used with the objective 'bina
ry:logistic' was changed from 'error' to 'logloss'. Explicitly set eval_metric if you'd like to restore the old behavior.
C:\Users\Admin\anaconda3\lib\site-packages\xgboost\sklearn.py:888: UserWarning: The use of label encoder in XGBClassifier is depre
cated and will be removed in a future release. To remove this warning, do the following: 1) Pass option use_label_encoder=False wh
en constructing XGBClassifier object; and 2) Encode your labels (y) as integers starting with 0, i.e. 0, 1, 2, ..., [num_class -
1].
  warnings.warn(label_encoder_deprecation_msg, UserWarning)
```

Out[91]:
```
0.9013452914798207
```

In [92]:
```
y_pre = model_1_final.predict(df_test[X_cols])
```

In [93]:
```
y_pre
```

Out[93]:
```
array([0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 0, 0, 1, 0, 1, 1, 0, 0, 0, 0, 0, 0,
       1, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 1, 1, 0, 0, 1,
       1, 0, 0, 0, 1, 1, 0, 0, 1, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 1,
       1, 0, 0, 1, 1, 0, 1, 0, 1, 0, 0, 1, 0, 1, 1, 0, 0, 0, 0, 0, 1, 0,
       1, 1, 1, 0, 1, 0, 0, 0, 1, 0, 1, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0,
       0, 1, 1, 1, 1, 0, 0, 1, 0, 1, 1, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 1,
       0, 0, 1, 1, 0, 1, 1, 1, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1,
       1, 1, 1, 1, 0, 1, 1, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1, 1,
       0, 0, 1, 1, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 1, 1, 0, 1, 0, 1, 0,
       1, 0, 1, 0, 1, 1, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1,
       0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 1,
       0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 1, 0, 0, 0, 0, 0, 1, 1, 1, 1, 0,
       0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 1,
       0, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0,
       1, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 1, 1, 0,
       0, 0, 1, 0, 1, 0, 0, 1, 0, 1, 1, 0, 1, 0, 0, 0, 1, 0, 0, 1, 0, 0,
       1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 1, 0, 0, 1,
       0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 0, 1, 0, 0, 0],
      dtype=int64)
```

In [94]:
```
df_test.shape
```

Out[94]:
```
(418, 22)
```

In [95]:
```
df_test['Survived'] = y_pre
```

In [96]:
```
df_test[['PassengerId','Survived']]
```

Out[96]:

| | PassengerId | Survived |
|---|---|---|
| **0** | 892 | 0 |
| **1** | 893 | 0 |
| **2** | 894 | 0 |
| **3** | 895 | 0 |
| **4** | 896 | 1 |
| **...** | ... | ... |
| **413** | 1305 | 0 |
| **414** | 1306 | 1 |
| **415** | 1307 | 0 |
| **416** | 1308 | 0 |
| **417** | 1309 | 0 |

418 rows × 2 columns

In [97]:
```
df_test[['PassengerId','Survived']].to_csv('sub02.csv', index=False)
```

In [ ]:
```

```