```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler, LabelEncoder
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score, confusion_matrix, classification_report
```

```
df = pd.read_csv("C:/Users/HP/Desktop/codsoft/Titanic-Dataset.csv")
```

```
print(df.head())
```

```
   PassengerId  Survived  Pclass  \
0            1         0       3
1            2         1       1
2            3         1       3
3            4         1       1
4            5         0       3

                                                Name     Sex   Age  SibSp  \
0                            Braund, Mr. Owen Harris    male  22.0      1
1  Cumings, Mrs. John Bradley (Florence Briggs Th...  female  38.0      1
2                             Heikkinen, Miss. Laina  female  26.0      0
3       Futrelle, Mrs. Jacques Heath (Lily May Peel)  female  35.0      1
4                           Allen, Mr. William Henry    male  35.0      0

   Parch            Ticket     Fare Cabin Embarked
0      0         A/5 21171   7.2500   NaN        S
1      0          PC 17599  71.2833   C85        C
2      0  STON/O2. 3101282   7.9250   NaN        S
3      0            113803  53.1000  C123        S
4      0            373450   8.0500   NaN        S
```

```
print(df.isnull().sum())
```

```
PassengerId      0
Survived         0
Pclass           0
Name             0
Sex              0
Age            177
SibSp            0
Parch            0
Ticket           0
Fare             0
Cabin          687
Embarked         2
dtype: int64
```

```
#Fill missing Age values with the median
df['Age'].fillna(df['Age'].median(), inplace=True)

#Fill missing Embarked values with the mode
df['Embarked'].fillna(df['Embarked'].mode()[0], inplace=True)

#Drop the Cabin column
df.drop(columns=['Cabin'], inplace=True)

#Drop rows with missing values in Fare
df.dropna(subset=['Fare'], inplace=True)

#Encode categorical variables
df['Sex'] = LabelEncoder().fit_transform(df['Sex'])
df['Embarked'] = LabelEncoder().fit_transform(df['Embarked'])

#Drop columns that won't be used for prediction
df.drop(columns=['PassengerId', 'Name', 'Ticket'], inplace=True)
```

```
C:\Users\HP\AppData\Local\Temp\ipykernel_8028\1862650414.py:2: FutureWarning: A value is trying to be set on a copy of a DataFrame
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are setting

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col] = df[co
```

```
  df['Age'].fillna(df['Age'].median(), inplace=True)
C:\Users\HP\AppData\Local\Temp\ipykernel_8028\1862650414.py:5: FutureWarning: A value is trying to be set on a copy of a DataFrame
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are setting

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col] = df[co


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

```
print(df.head())
```

```
   Survived  Pclass  Sex   Age  SibSp  Parch     Fare  Embarked
0         0       3    1  22.0      1      0   7.2500         2
1         1       1    0  38.0      1      0  71.2833         0
2         1       3    0  26.0      0      0   7.9250         2
3         1       1    0  35.0      1      0  53.1000         2
4         0       3    1  35.0      0      0   8.0500         2
```

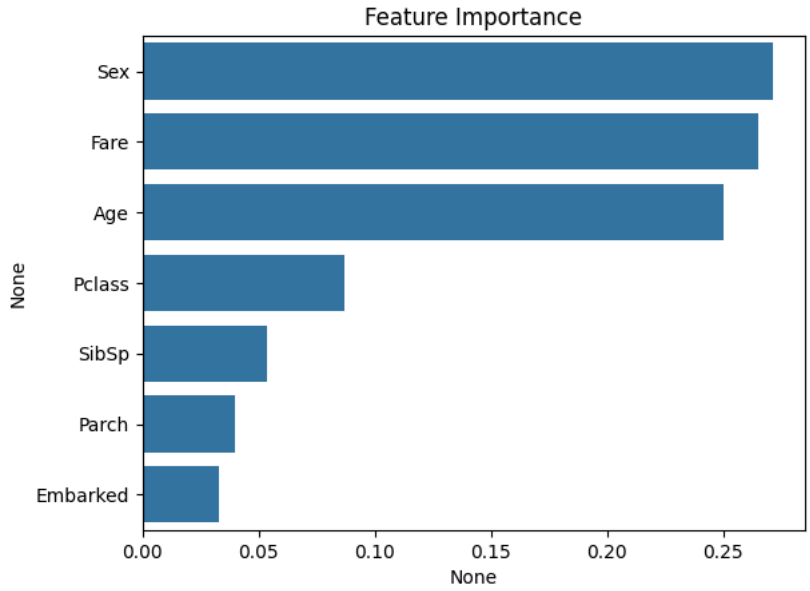
```
#Define features and target
X = df.drop(columns=['Survived'])
y = df['Survived']

#Split data into training and test sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

#Scale features
scaler = StandardScaler()
X_train = scaler.fit_transform(X_train)
X_test = scaler.transform(X_test)



#initialize the model
model = RandomForestClassifier(n_estimators=100, random_state=42)

#Train the model
model.fit(X_train, y_train)

#Make predictions
y_pred = model.predict(X_test)

#Evaluate the model
accuracy = accuracy_score(y_test, y_pred)
print(f'Accuracy: {accuracy:.2f}')

#Confusion matrix and classification report
print(confusion_matrix(y_test, y_pred))
print(classification_report(y_test, y_pred))
```

```
Accuracy: 0.82
[[92 13]
 [19 55]]
              precision    recall  f1-score   support

           0       0.83      0.88      0.85       105
           1       0.81      0.74      0.77        74

    accuracy                           0.82       179
   macro avg       0.82      0.81      0.81       179
weighted avg       0.82      0.82      0.82       179
```

```
print(df.head())
```

```
   Survived  Pclass  Sex   Age  SibSp  Parch     Fare  Embarked
0         0       3    1  22.0      1      0   7.2500         2
1         1       1    0  38.0      1      0  71.2833         0
2         1       3    0  26.0      0      0   7.9250         2
3         1       1    0  35.0      1      0  53.1000         2
4         0       3    1  35.0      0      0   8.0500         2
```

```
#Feature importance
feature_importance = pd.Series(model.feature_importances_, index=X.columns).sort_values(ascending=False)

#Plot feature importance
sns.barplot(x=feature_importance, y=feature_importance.index)
plt.title('Feature Importance')
plt.show()
```



Start coding or generate with AI.

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