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# Import necessary libraries

import pandas as pd

from sklearn.model_selection import train_test_split

from sklearn.ensemble import RandomForestClassifier

from sklearn.metrics import accuracy_score, confusion_matrix, classification_report


# Load the Titanic dataset

data = pd.read_csv('titanic.csv')


# Explore the dataset

print("Dataset head:")

print(data.head())


# Preprocessing: Drop irrelevant columns and handle missing values

data.drop(['PassengerId', 'Name', 'Ticket', 'Cabin'], axis=1, inplace=True)

data['Age'].fillna(data['Age'].median(), inplace=True)

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


# Convert categorical variables into numerical variables

data = pd.get_dummies(data, columns=['Sex', 'Embarked'], drop_first=True)


# Split the dataset into features (X) and labels (y)

X = data.drop('Survived', axis=1)

y = data['Survived']


# Split the dataset into training and testing sets

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)


# Train a Random Forest classifier

classifier = RandomForestClassifier(n_estimators=100, random_state=42)

classifier.fit(X_train, y_train)
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# Predictions
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y_pred = classifier.predict(X_test)
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# Evaluate the model
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accuracy = accuracy_score(y_test, y_pred)
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print("\nAccuracy:", accuracy)
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conf_matrix = confusion_matrix(y_test, y_pred)
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print("\nConfusion Matrix:")
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print(conf_matrix)
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report = classification_report(y_test, y_pred)
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print("\nClassification Report:")
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print(report)
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