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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
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score, classification_report, confusion_matrix

# Load the dataset
data = pd.read_csv('liver_cirrhosis.csv')

# Preprocess the data
# Handling missing values
data.fillna(method='ffill', inplace=True)

# Splitting the data into features (X) and target (y)
X = data.drop(columns=['Cirrhosis'])
y = data['Cirrhosis']

# Split the data 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)

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

# Build the RandomForestClassifier model
model = RandomForestClassifier(n_estimators=100, random_state=42)
model.fit(X_train, y_train)
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# Make predictions
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y_pred = model.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(f'Accuracy: {accuracy*100:.2f}%')
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# Print the classification report
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print('Classification Report:')
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print(classification_report(y_test, y_pred))
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# Plot the confusion matrix
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conf_matrix = confusion_matrix(y_test, y_pred)
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sns.heatmap(conf_matrix, annot=True, fmt='d', cmap='Blues', xticklabels=['No Cirrhosis', 'Cirrhosis'],  
yticklabels=['No Cirrhosis', 'Cirrhosis'])
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plt.xlabel('Predicted')
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plt.ylabel('True')
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```
plt.title('Confusion Matrix')
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plt.show()
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