Mids4a

import pandas as pd

from sklearn.model\_selection import train\_test\_split

from sklearn.preprocessing import LabelEncoder, StandardScaler

from sklearn.ensemble import RandomForestClassifier

from sklearn.metrics import accuracy\_score, classification\_report

# Load dataset

df = pd.read\_csv("abalone - abalone.csv")

# Encode categorical 'Sex' column

df['Sex'] = LabelEncoder().fit\_transform(df['Sex'])

# Define age categories based on Rings

bins = [0, 7, 10, float('inf')]

labels = ['young', 'middle-aged', 'old']

df['AgeGroup'] = pd.cut(df['Rings'], bins=bins, labels=labels)

# Encode target labels

label\_encoder = LabelEncoder()

y = label\_encoder.fit\_transform(df['AgeGroup'])

# Features

X = df.drop(['Rings', 'AgeGroup'], axis=1)

# Standardize features

scaler = StandardScaler()

X\_scaled = scaler.fit\_transform(X)

# Split data

X\_train, X\_test, y\_train, y\_test = train\_test\_split(X\_scaled, y, test\_size=0.2, random\_state=42)

# Train classifier

model = RandomForestClassifier(random\_state=42)

model.fit(X\_train, y\_train)

# Predict and evaluate

y\_pred = model.predict(X\_test)

print("Accuracy:", accuracy\_score(y\_test, y\_pred))

print("\nClassification Report:\n")

print(classification\_report(y\_test, y\_pred, target\_names=label\_encoder.classes\_))