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import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score, classification_report

# Sample mobile price dataset
data = {
    "RAM": [2, 4, 6, 8, 12, 3, 4, 6],
    "Storage": [16, 32, 64, 128, 256, 32, 64, 128],
    "Battery": [3000, 3500, 4000, 4500, 5000, 3200, 4200, 4800],
    "Camera": [8, 12, 16, 48, 64, 13, 20, 48],
    "PriceRange": ["Low", "Medium", "Medium", "High", "High", "Low",
"Medium", "High"]
}

df = pd.DataFrame(data)
df

{"summary": "{\n  \"name\": \"df\",\n  \"rows\": 8,\n  \"fields\": [\n    {\n      \"column\": \"RAM\",\n      \"properties\": {\n        \"dtype\": \"number\",\n        \"std\": 3,\n        \"min\": 2,\n        \"max\": 12,\n        \"num_unique_values\": 6,\n        \"samples\": [\n          2,\n          4,\n          3\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"Storage\",\n      \"properties\": {\n        \"dtype\": \"number\",\n        \"std\": 79,\n        \"min\": 16,\n        \"max\": 256,\n        \"num_unique_values\": 5,\n        \"samples\": [\n          32,\n          256,\n          64\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"Battery\",\n      \"properties\": {\n        \"dtype\": \"number\",\n        \"std\": 738,\n        \"min\": 3000,\n        \"max\": 5000,\n        \"num_unique_values\": 8,\n        \"samples\": [\n          3500,\n          3200,\n          3000\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"Camera\",\n      \"properties\": {\n        \"dtype\": \"number\",\n        \"std\": 21,\n        \"min\": 8,\n        \"max\": 64,\n        \"num_unique_values\": 7,\n        \"samples\": [\n          8,\n          12,\n          13\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"PriceRange\",\n      \"properties\": {\n        \"dtype\": \"category\",\n        \"num_unique_values\": 3,\n        \"samples\": [\n          \"Low\",\n          \"Medium\",\n          \"High\"\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    }\n  ]\n}", "type": "dataframe", "variable_name": "df"}

# Convert target labels to numerical values
df["PriceRange"] = df["PriceRange"].map({

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        "Low": 0,
        "Medium": 1,
        "High": 2
    })

X = df[["RAM", "Storage", "Battery", "Camera"]]
y = df["PriceRange"]

X_train, X_test, y_train, y_test = train_test_split(
    X, y, test_size=0.25, random_state=42
)

model = RandomForestClassifier(n_estimators=100, random_state=42)
model.fit(X_train, y_train)

RandomForestClassifier(random_state=42)

y_pred = model.predict(X_test)

print("Accuracy:", accuracy_score(y_test, y_pred))
print("\nClassification Report:\n",
      classification_report(y_test, y_pred, zero_division=0))

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Accuracy: 0.5

Classification Report:

	precision	recall	f1-score	support
0	0.50	1.00	0.67	1
1	0.00	0.00	0.00	1
accuracy			0.50	2
macro avg	0.25	0.50	0.33	2
weighted avg	0.25	0.50	0.33	2

New mobile phone details

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new_mobile = pd.DataFrame(
    [[6, 128, 4500, 48]],
    columns=["RAM", "Storage", "Battery", "Camera"]
)

prediction = model.predict(new_mobile)

price_map = {0: "Low", 1: "Medium", 2: "High"}
print("Predicted Mobile Price Range:", price_map[prediction[0]])

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Predicted Mobile Price Range: High