

RIPHAH INTERNATIONAL UNIVERSITY, ISLAMABAD



Lab 11

Bachelors of Computer science – 6th semester

Subject: Artificial Intelligence Lab

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Lab Tasks

Task 1:

Naive Bayes Algorithm:

Implement the naive Bayes algorithm on the dataset shared via the given link.

Dataset: <https://tinyurl.com/y2r9vzde>

Code:

Step 1: Import Libraries

```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.naive_bayes import GaussianNB
from sklearn.metrics import classification_report, accuracy_score
from sklearn.preprocessing import LabelEncoder
```

Step 2: Load Dataset

```
df = pd.read_csv("C:/Users/user/OneDrive/Desktop/Sixth Semester/Artificial Intelligence
Lab/AI Lab 11/Iris Dataset - Public Livelihood Data.csv")
df.dropna(inplace=True) # Drop missing values if any
```

Step 3: Preprocess Categorical Data

```
label_encoders = {}
for column in df.columns:
    le = LabelEncoder()
    df[column] = le.fit_transform(df[column])
    label_encoders[column] = le
```

Step 4: Split into Features and Target

```
X = df.drop("Salary", axis=1)
y = df["Salary"]
```

Step 5: Split the Dataset

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

Step 6: Train the Naive Bayes Classifier

```
model = GaussianNB()
```

```
model.fit(X_train, y_train)
```

Step 7: Make Predictions

```
y_pred = model.predict(X_test)
```

Step 8: Evaluate the Classifier

```
accuracy = accuracy_score(y_test, y_pred)
```

```
print("Accuracy:", accuracy)
```

Step 9: Show Predicted & Actual Labels

```
print("\nPredicted labels:", y_pred)
```

```
print("Actual labels: ", y_test.values)
```

```
print("\nClassification Report:\n", classification_report(y_test,y_pred))
```

```
1  # Step 1: Import Libraries
2  ~ import pandas as pd
3  from sklearn.model_selection import train_test_split
4  from sklearn.naive_bayes import GaussianNB
5  from sklearn.metrics import classification_report, accuracy_score
6  from sklearn.preprocessing import LabelEncoder
7
8
9  # Step 2: Load Dataset
10 df = pd.read_csv("C:/Users/user/OneDrive/Desktop/Sixth Semester/Artificial Intelligence Lab/AI Lab 1
11 df.dropna(inplace=True) # Drop missing values if any
12
13 # Step 3: Preprocess Categorical Data
14 label_encoders = {}
15 ~ for column in df.columns:
16     le = LabelEncoder()
17     df[column] = le.fit_transform(df[column])
18     label_encoders[column] = le
19
20 # Step 4: Split into Features and Target
21 X = df.drop(labels="Salary", axis=1)
22 y = df["Salary"]
23
24 # Step 5: Split the Dataset
25 X_train, X_test, y_train, y_test = train_test_split(*arrays: X, y, test_size=0.2, random_state=42)
26
27
28
29 # Step 6: Train the Naive Bayes Classifier
30 model = GaussianNB()
31 model.fit(X_train, y_train)
32
33 # Step 7: Make Predictions
34 y_pred = model.predict(X_test)
35
36 # Step 8: Evaluate the Classifier
37 accuracy = accuracy_score(y_test, y_pred)
38 print("Accuracy:", accuracy)
39
40 # Step 9: Show Predicted & Actual Labels
41 print("\nPredicted labels:", y_pred)
42 print("Actual labels:  ", y_test.values)
43
44 print("\nClassification Report:\n", classification_report(y_test, y_pred))
45
46
```

Output:

```
"C:\Program Files\Python313\python.exe" "C:\Users\user\0
```

```
Accuracy: 0.760325502840473
```

```
Predicted labels: [0 0 0 ... 1 0 0]
```

```
Actual labels:    [0 0 1 ... 1 0 0]
```

```
Classification Report:
```

	precision	recall	f1-score	support
0	0.87	0.80	0.84	4942
1	0.50	0.63	0.56	1571
accuracy			0.76	6513
macro avg	0.69	0.72	0.70	6513
weighted avg	0.78	0.76	0.77	6513

```
Process finished with exit code 0
```