Assessment Report

on

“**Diagnose Diabetes:** Use patient medical records to classify if an individual has diabetes.”

submitted as partial fulfillment for the award of

BACHELOR OF TECHNOLOGY DEGREE

SESSION 2024-25

in

CSE (AI&ML)

By

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Problem :

Diagnose Diabetes: Use patient medical records to classify if an individual has diabetes.

Solution :

Diabetes is a life-threatening but manageable chronic illness that occurs when the body cannot properly process blood sugar (glucose). Early detection and diagnosis are critical in preventing complications such as heart disease, kidney damage, and nerve issues.

However, diagnosing diabetes based on physical symptoms alone is challenging because its early stages are often asymptomatic. This creates a need for **automated diagnostic tools** that can assist healthcare providers by analyzing **medical records** such as:

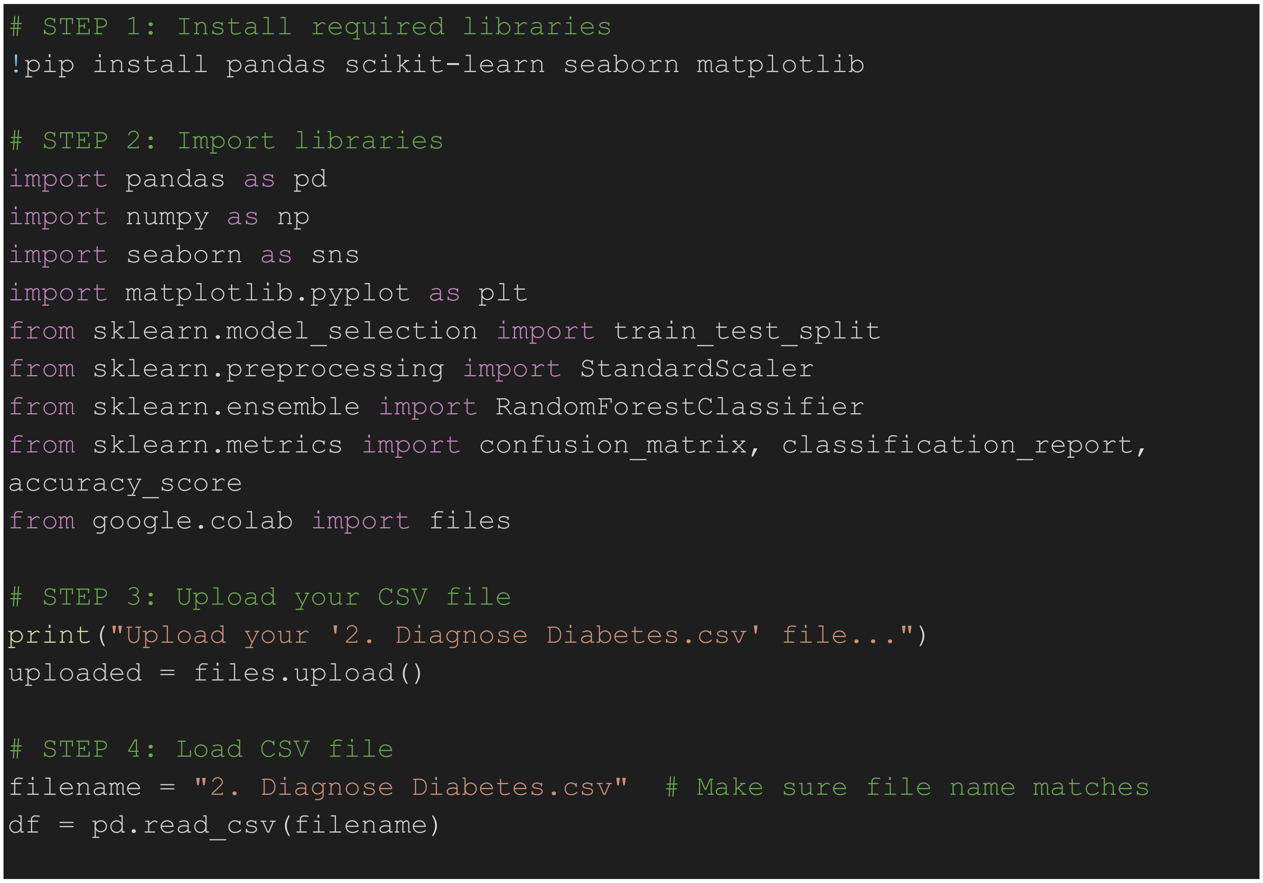
- Blood glucose levels
- Body Mass Index (BMI)
- Age
- Insulin levels
- Blood pressure
- Pregnancies

In this project, the goal is to build a **classification model** using machine learning that can predict whether a person is diabetic (`1`) or not (`0`) based on these medical attributes. This model learns patterns from historical patient data and uses that knowledge to diagnose new, unseen cases.

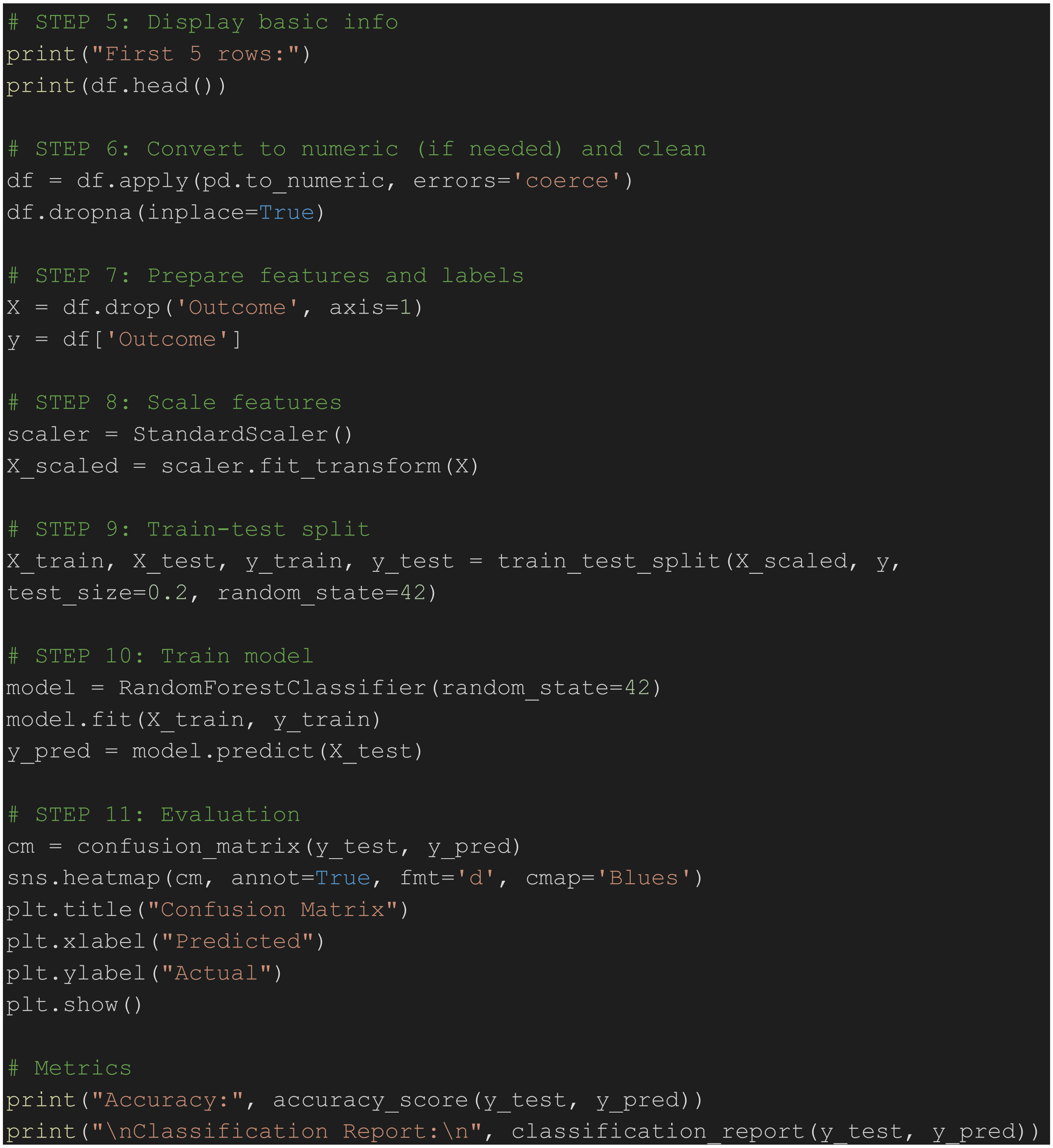
Such a predictive tool can:

- Help doctors with faster screening,
- Reduce diagnostic errors,
- And improve patient outcomes by enabling **early intervention**.

Code :

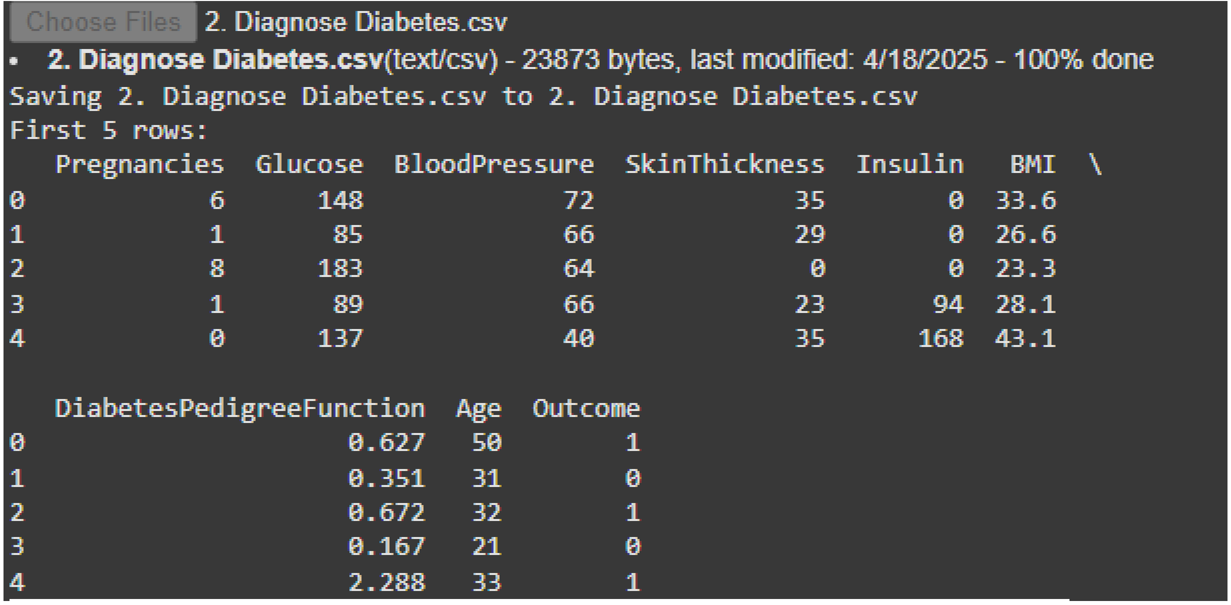


```
# STEP 1: Install required libraries
!pip install pandas scikit-learn seaborn matplotlib

# STEP 2: Import libraries
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 confusion_matrix, classification_report,
accuracy_score
from google.colab import files

# STEP 3: Upload your CSV file
print("Upload your '2. Diagnose Diabetes.csv' file...")
uploaded = files.upload()

# STEP 4: Load CSV file
filename = "2. Diagnose Diabetes.csv"  # Make sure file name matches
df = pd.read_csv(filename)
```

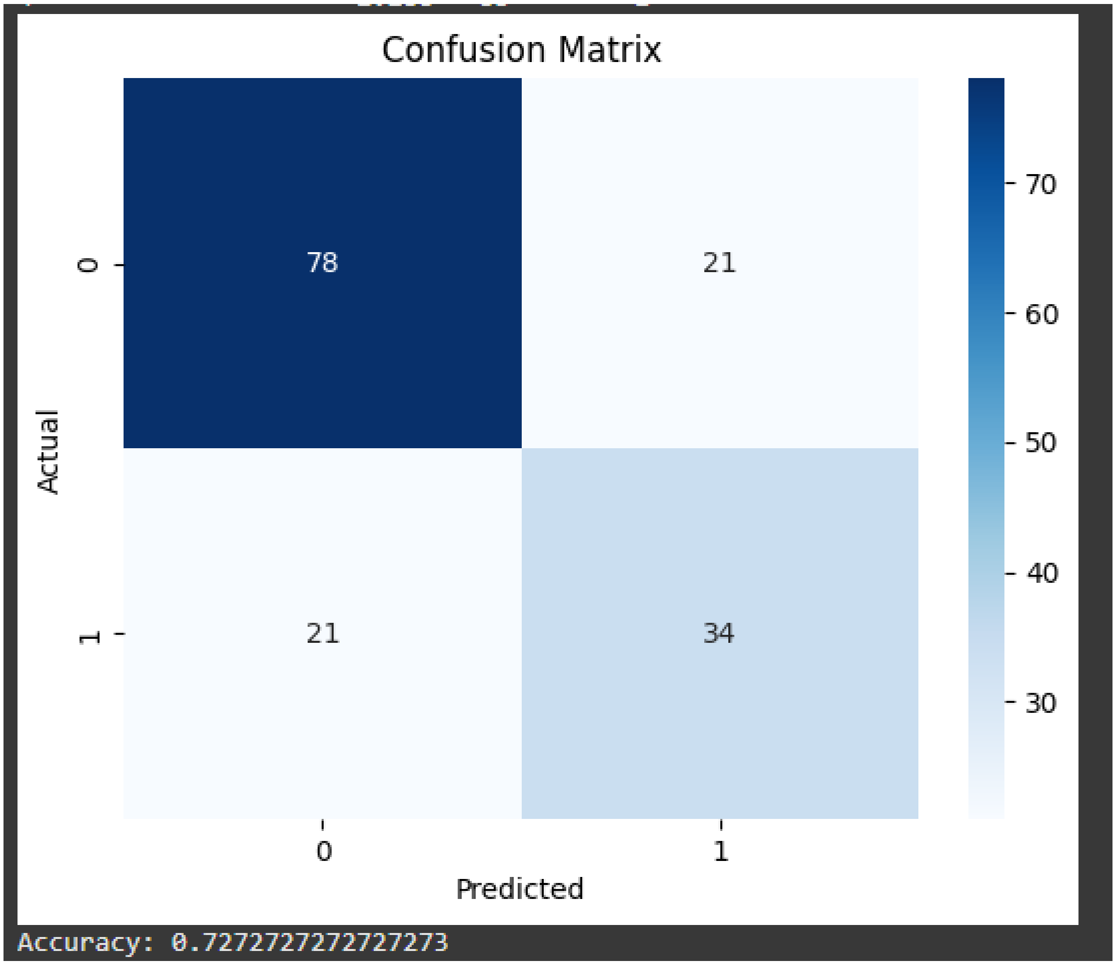


```
# STEP 5: Display basic info
print("First 5 rows:")
print(df.head())

# STEP 6: Convert to numeric (if needed) and clean
df = df.apply(pd.to_numeric, errors='coerce')
df.dropna(inplace=True)

# STEP 7: Prepare features and labels
X = df.drop('Outcome', axis=1)
y = df['Outcome']

# STEP 8: Scale features
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)

# STEP 9: Train-test split
X_train, X_test, y_train, y_test = train_test_split(X_scaled, y,
test_size=0.2, random_state=42)

# STEP 10: Train model
model = RandomForestClassifier(random_state=42)
model.fit(X_train, y_train)
y_pred = model.predict(X_test)

# STEP 11: Evaluation
cm = confusion_matrix(y_test, y_pred)
sns.heatmap(cm, annot=True, fmt='d', cmap='Blues')
plt.title("Confusion Matrix")
plt.xlabel("Predicted")
plt.ylabel("Actual")
plt.show()

# Metrics
print("Accuracy:", accuracy_score(y_test, y_pred))
print("\nClassification Report:\n", classification_report(y_test, y_pred))
```

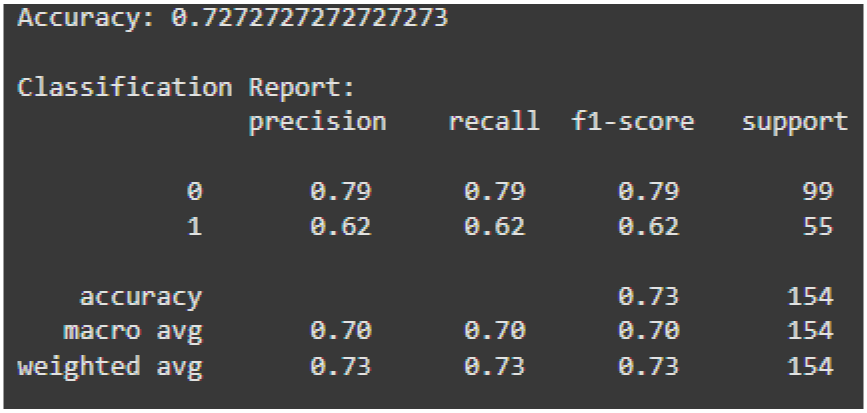
SCREENSHOTS :



```
2. Diagnose Diabetes.csv
• 2. Diagnose Diabetes.csv(text/csv) - 23873 bytes, last modified: 4/18/2025 - 100% done
Saving 2. Diagnose Diabetes.csv to 2. Diagnose Diabetes.csv
First 5 rows:
   Pregnancies  Glucose  BloodPressure  SkinThickness  Insulin   BMI  \
0            6      148             72             35        0  33.6
1            1       85             66             29        0  26.6
2            8      183             64              0        0  23.3
3            1       89             66             23       94  28.1
4            0      137             40             35      168  43.1

   DiabetesPedigreeFunction  Age  Outcome
0                     0.627   50        1
1                     0.351   31        0
2                     0.672   32        1
3                     0.167   21        0
4                     2.288   33        1
```



```
Accuracy: 0.7272727272727273
```



```
Accuracy: 0.7272727272727273

Classification Report:
              precision    recall  f1-score   support

           0       0.79      0.79      0.79        99
           1       0.62      0.62      0.62        55

    accuracy                           0.73       154
   macro avg       0.70      0.70      0.70       154
weighted avg       0.73      0.73      0.73       154
```

Refrence :

Dataset Source: Pima Indians Diabetes Database

Code developed using: Python, scikit-learn, seaborn, matplotlib, Google Colab

Tools: Jupyter/Colab Notebook, Google Colab File Upload feature