Expt. No.

Date 21/02/2024

Page No. 13

Expt. Name

EXPERIMENT - 5

Aim :- Develop a robust and efficient script for automating a decision-making process, leveraging artificial intelligence and machine learning techniques to enhance accuracy, speed and consistency in decision outcomes.

Software Required :- Python, Numpy, Pandas, Scikit-learn

Relevance of the Experiment :- The experiment aims to addresses the pressing need for reliable decision-making by integrating artificial intelligence and machine learning, ensuring heightened accuracy in outcomes. By leveraging advanced techniques, the developed script accelerates decision processes, emphasizing a significant improvement in speed compared to traditional manual methods. The script's incorporation of artificial intelligence and machine learning fosters a consistent and unbiased decision-making framework, promoting fairness and reducing variability in outcomes.

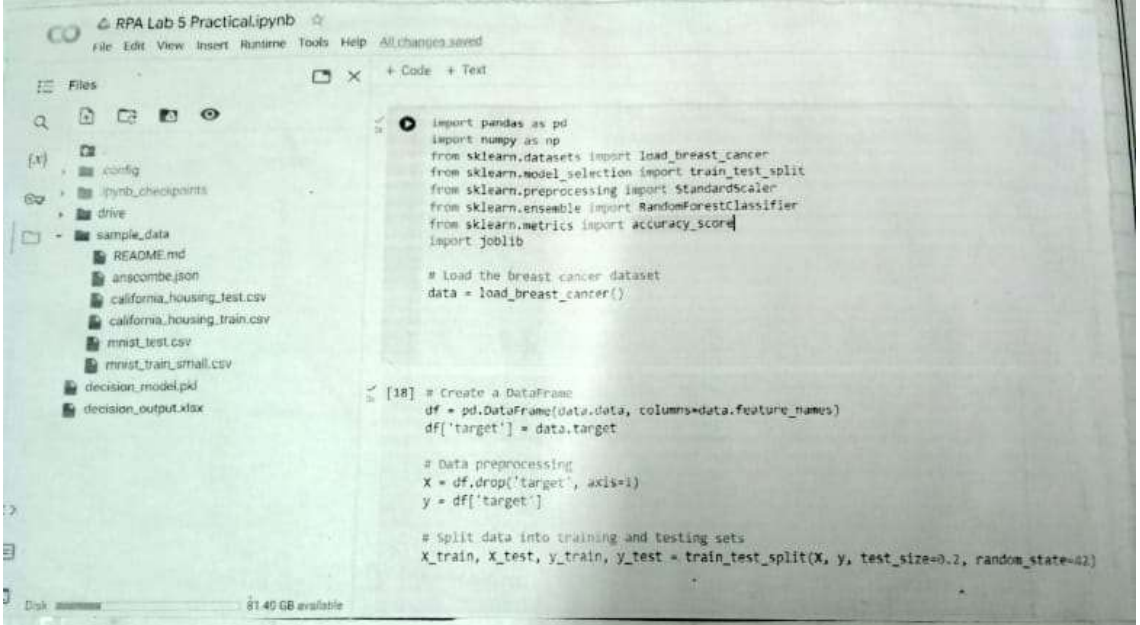
Description :-

1. The script will handle data cleaning, normalization, and feature engineering to prepare the input data for machine learning analysis.

2. Employ a suitable machine learning model or a combination of models depending on the nature of the decision-making process. This could include classification models, regression models, or even more advanced techniques like ensemble learning.

Teacher's Signature:

Aim: Develop a robust and efficient script for automating a decision-making process, leveraging artificial intelligence and machine learning techniques to enhance accuracy, speed and consistency in decision outcomes.

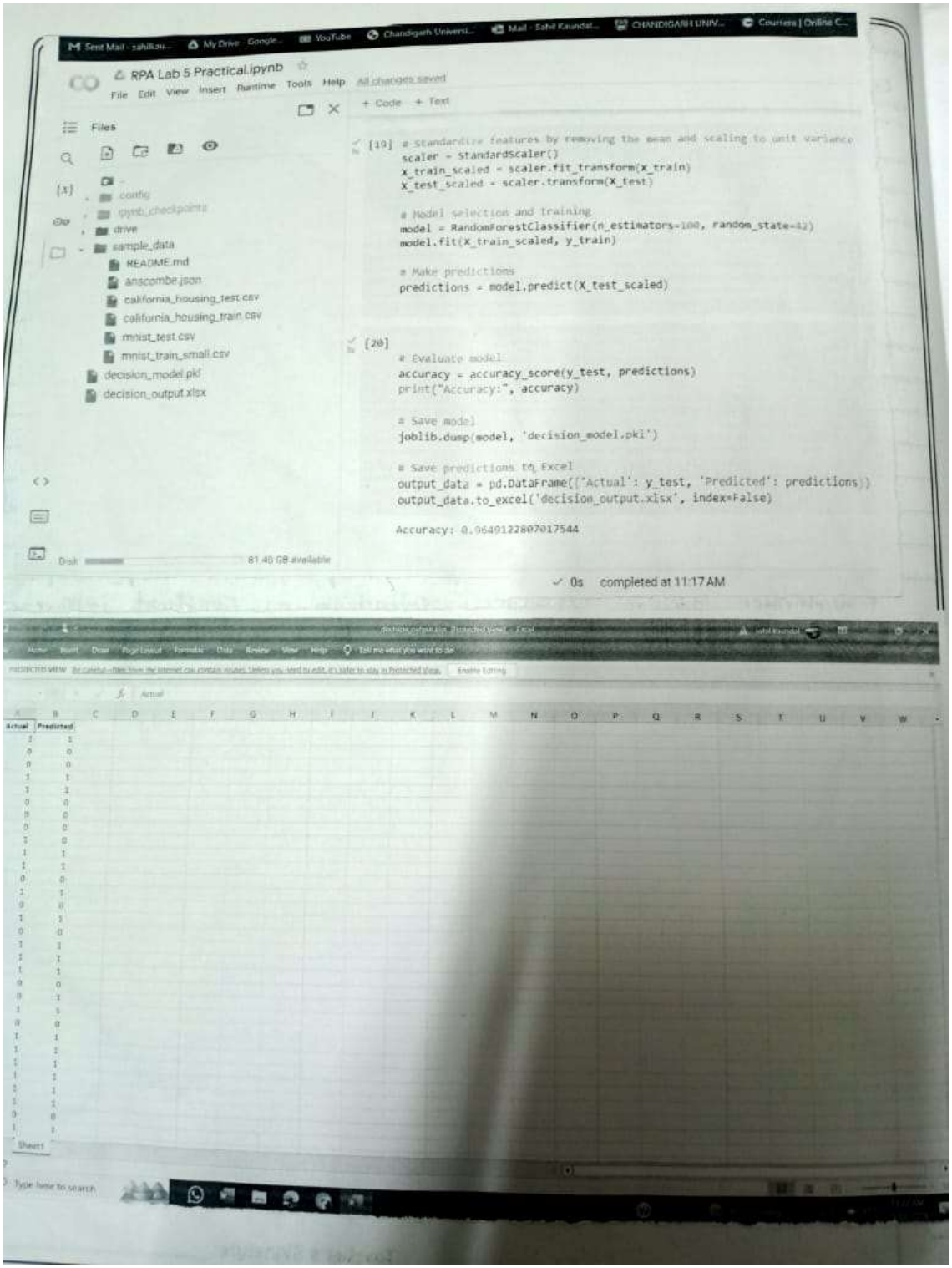


3. Train the selected model using historical data, ensuring the model's ability to generalize to new, unseen data. Implement validation techniques to assess and improve the model's performance.
4. Utilize AI techniques, such as natural language processing (NLP) or computer vision, if applicable to the decision-making process. For instance, if the decision involves text analysis or image recognition, integrate relevant AI capabilities.
5. Implement the decision-making logic within the script, allowing it to autonomously analyze input data and make informed decisions based on the trained model's predictions.
6. Establish a feedback loop to continuously improve the ~~imp~~ models performance over time. This may involve retraining the model with new data or adjusting parameters based on feedback from decision outcomes.
7. Implement robust error-handling mechanisms to address unexpected situations gracefully. Log relevant information to facilitate debugging and monitoring of the script's performance.

Learning Outcomes :-

1. Comprehend the role of artificial intelligence and machine learning in automating decision-making processes.
2. Recognize scenarios where AI or ML techniques can enhance accuracy, speed and consistency in decision outcomes.
3. Gain hands-on experience in cleaning and preprocessing data for effective use in machine learning models.

Teacher's Signature:



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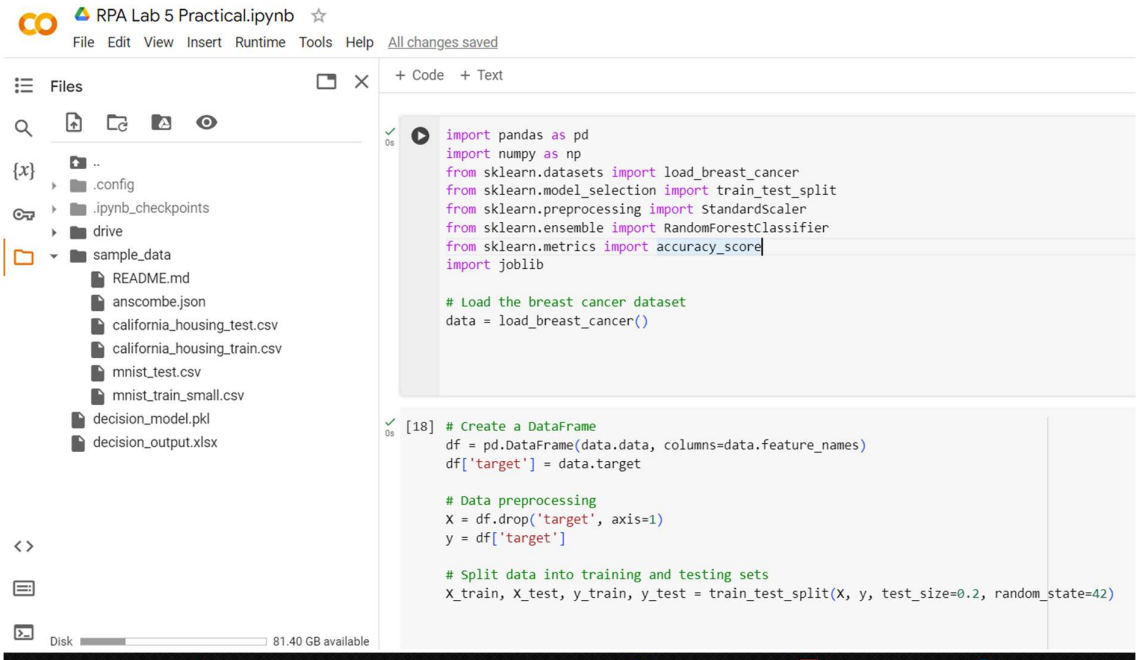
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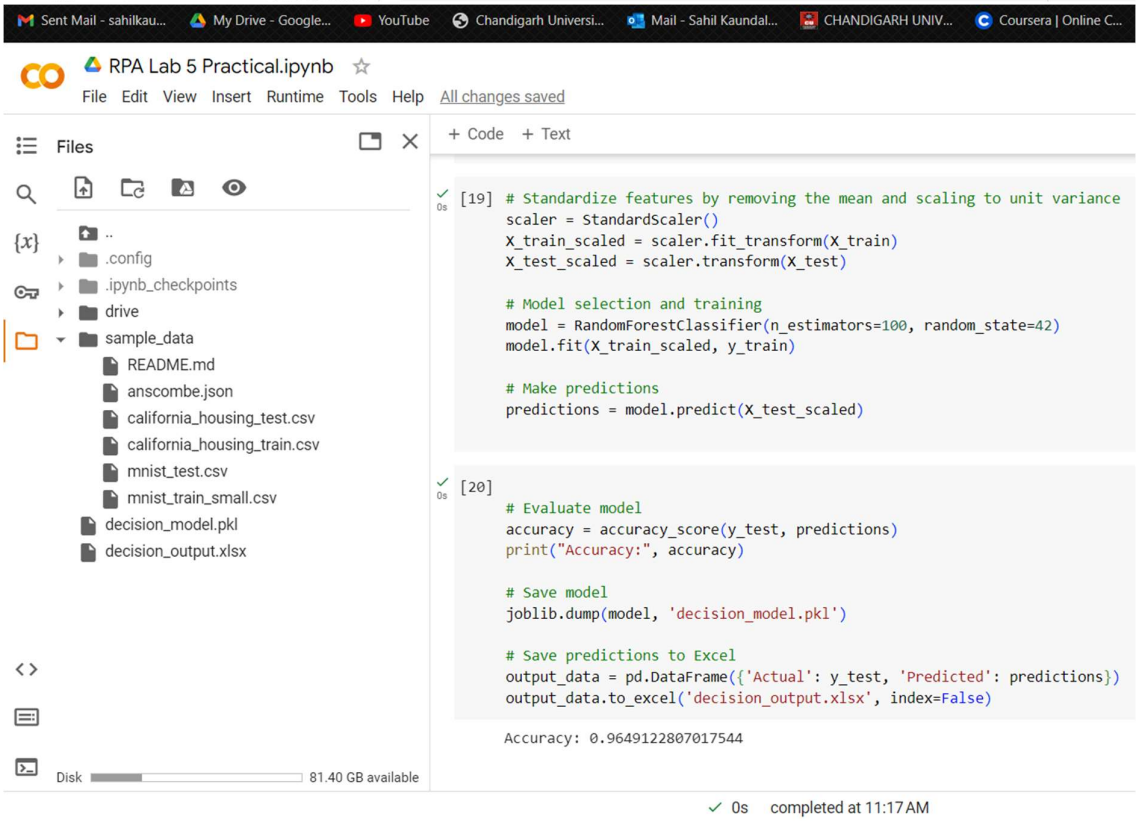
mnist_test.csv
mnist_train_small.csv
decision_model.pkl
decision_output.xlsx
Disk 81.40 GB available
import pandas as pd
import numpy as np
from sklearn.datasets import load_breast_cancer
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score
import joblib
# Load the breast cancer dataset
data = load_breast_cancer()
[18] # Create a DataFrame
df = pd.DataFrame(data.data, columns=data.feature_names)
df['target'] = data.target
# Data preprocessing
X = df.drop('target', axis=1)
y = df['target']
# Split 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)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california_housing_train.csv
mnist_test.csv
mnist_train_small.csv
decision_model.pkl
decision_output.xlsx
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[19] # Standardize features by removing the mean and scaling to unit variance
scaler = StandardScaler()
X_train_scaled = scaler.fit_transform(X_train)
X_test_scaled = scaler.transform(X_test)
# Model selection and training
model = RandomForestClassifier(n_estimators=100, random_state=42)
model.fit(X_train_scaled, y_train)
# Make predictions
predictions = model.predict(X_test_scaled)
[20]
# Evaluate model
accuracy = accuracy_score(y_test, predictions)
print("Accuracy:", accuracy)
# Save model
joblib.dump(model, 'decision_model.pkl')
# Save predictions to Excel
output_data = pd.DataFrame({'Actual': y_test, 'Predicted': predictions})
output_data.to_excel('decision_output.xlsx', index=False)
Accuracy: 0.9649122807017544
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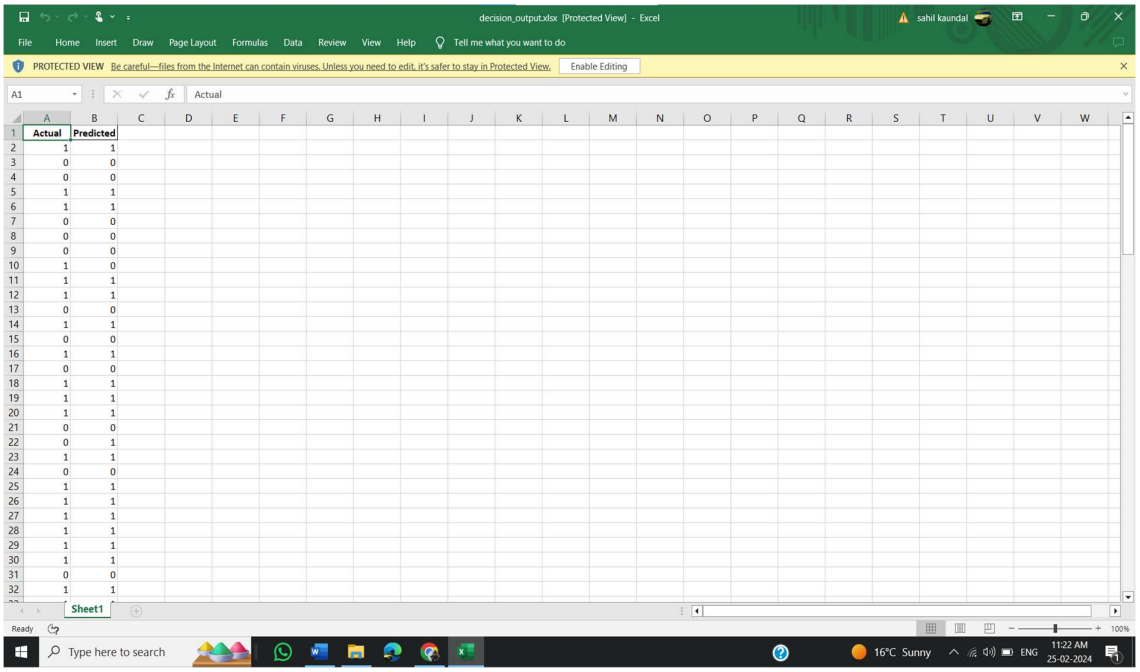
decision_output.xlsx [Protected View] - Excel
sahil kaundal
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Sheet1
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