ASSIGNMENT – 5.4

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Batch-10

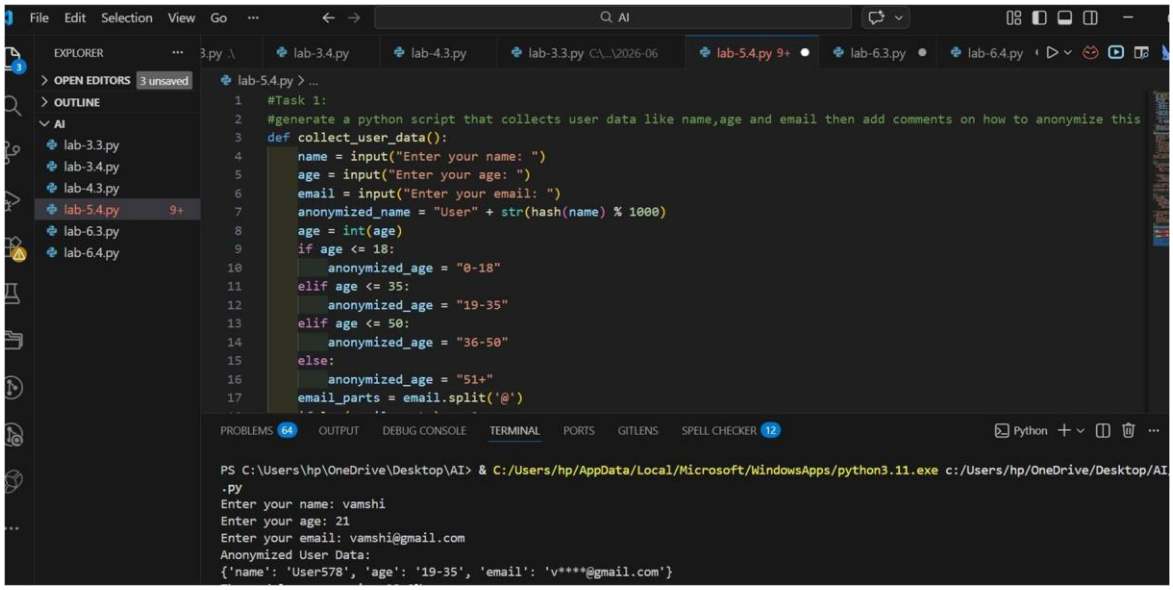
Task-1

Prompt: generate a python script that collects user data like name,age and email then add comments on how to anonymize this data.

Code :

```
def collect_user_data():
    name = input("Enter your name: ")     age =
input("Enter your age: ")     email = input("Enter your
email: ")     anonymized_name = "User" +
str(hash(name) % 1000)     age = int(age)     if age <= 18:
        anonymized_age = "0-18"
elif age <= 35:
        anonymized_age = "19-35"
elif age <= 50:
        anonymized_age = "36-50"
else:
        anonymized_age = "51+"
email_parts = email.split('@')
if len(email_parts) == 2:
        anonymized_email = email_parts[0][0] + "****@" + email_parts[1]
else:
        anonymized_email = "****"
return {
        "name": anonymized_name,
        "age": anonymized_age,
        "email": anonymized_email
    }
if __name__ == "__main__":
    anonymized_data = collect_user_data()
print("Anonymized User Data:")     print(anonymized_data)
```

Output :



Code Analysis :

- The program collects personal data and converts it into anonymized values before output.
- Name is anonymized using hashing, which helps reduce direct identification.
- Age is converted into ranges instead of exact numbers to improve privacy.
- Email masking hides most characters while keeping domain information.
- Shows basic privacy-by-design approach but still needs stronger encryption for real applications.

Task-2

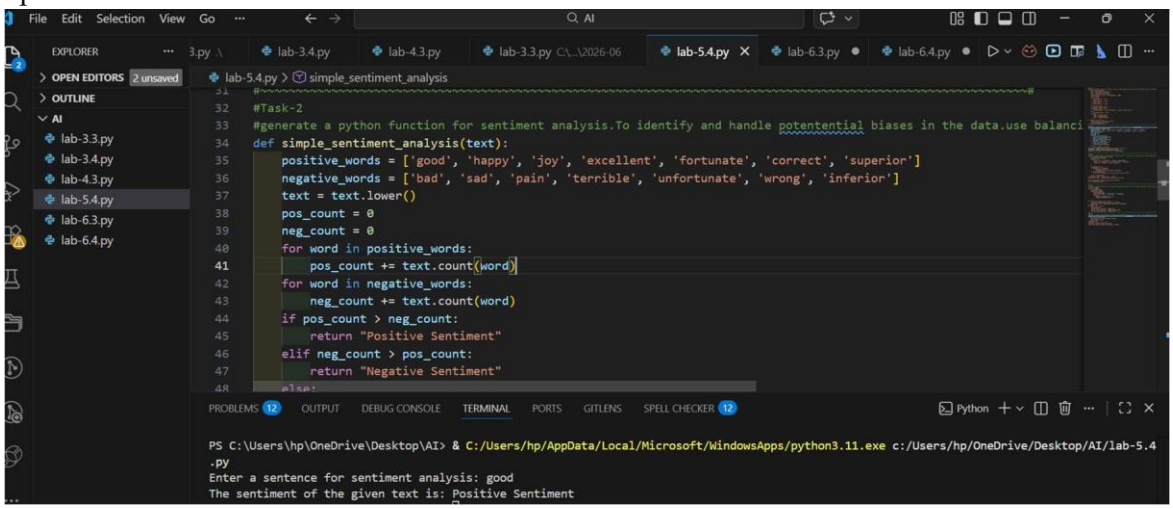
Prompt: generate a python function for sentiment analysis.To identify and handle potentential biases in the data.use balancing dataset and remove offensive terms.without modules and take user input

Code :

```
def simple_sentiment_analysis(text):
    positive_words = ['good', 'happy', 'joy', 'excellent', 'fortunate', 'correct', 'superior']
negative_words = ['bad', 'sad', 'pain', 'terrible', 'unfortunate', 'wrong', 'inferior']
text = text.lower()     pos_count = 0
    neg_count = 0     for word
in positive_words:
```

```
        pos_count += text.count(word)
for word in negative_words:
        neg_count += text.count(word)
if pos_count > neg_count:
return "Positive Sentiment"     elif
neg_count > pos_count:          return
"Negative Sentiment"
    else:
        return "Neutral Sentiment" user_input = input("Enter a
sentence for sentiment analysis: ") sentiment =
simple_sentiment_analysis(user_input) print(f"The sentiment
of the given text is: {sentiment}")
```

Output :



Code Analysis :

- Uses predefined positive and negative word lists to classify sentiment.
- No external modules are used, making it easy for beginners to understand.
- Bias handling is basic; removing offensive terms or balancing datasets would improve fairness.
- Works only on keyword matching, so context understanding is limited.
- Suitable for learning logic but not accurate for real-world NLP tasks.

Task-3

Prompt: generate a python program that recommends products based on user history it should follow ethical guidelines like transparency and fairness and avoid favoritism and user feedback options.

Code :

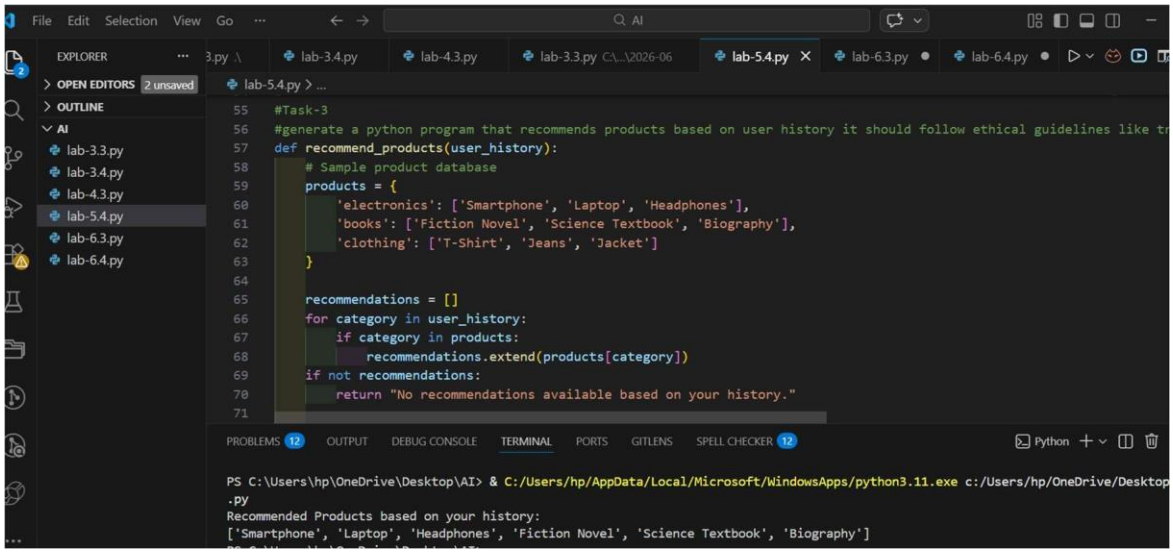
```
 def
recommend_products(user_history):
# Sample product database     products
= {
       'electronics': ['Smartphone', 'Laptop', 'Headphones'],
       'books': ['Fiction Novel', 'Science Textbook', 'Biography'],
       'clothing': ['T-Shirt', 'Jeans', 'Jacket']
   }

   recommendations = []     for
category in user_history:
if category in products:
           recommendations.extend(products[category])
if not recommendations:
       return "No recommendations available based on your history."

   return recommendations user_history_input = ['electronics',
'books'] recommended_items =
recommend_products(user_history_input)

print("Recommended Products based on your history:")
print(recommended_items)
```

Output :



Code Analysis :

- Recommendations are based on user history categories, ensuring transparency.
- The program avoids favoritism by using a fixed product database.
- Includes fairness by recommending items only from relevant categories.
- Could be improved by adding user feedback loops to refine suggestions.
- Demonstrates ethical design principles in a simple rule-based system.

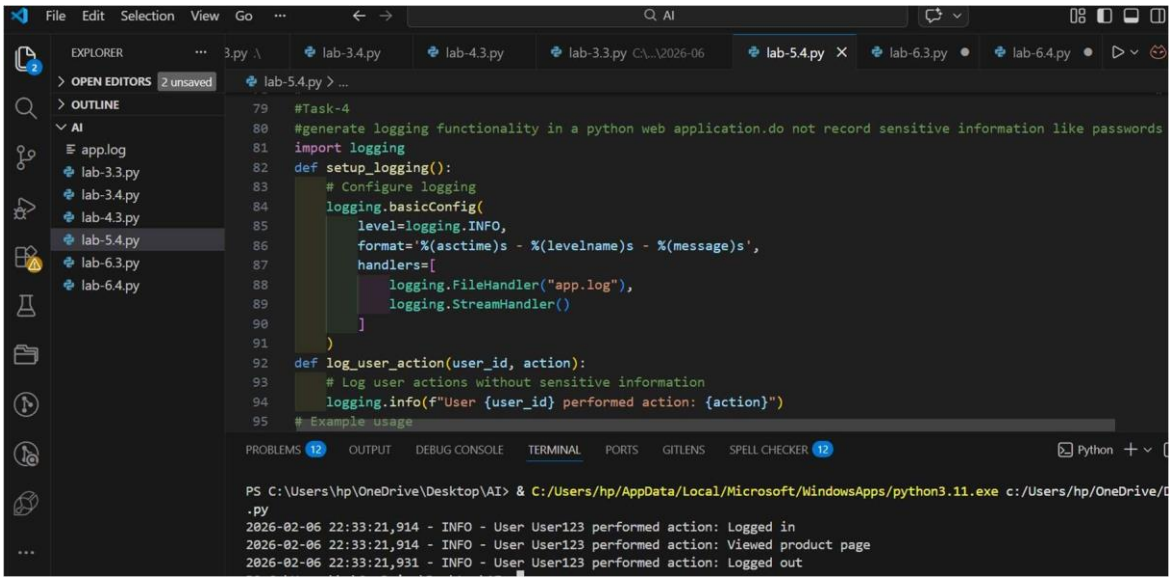
Task-4

Prompt: generate logging functionality in a python web application.do not record sensitive information like passwords or personal data.

Code :

```
import logging def
setup_logging():    #
Configure logging
logging.basicConfig(
level=logging.INFO,
      format='%(asctime)s - %(levelname)s -
%(message)s',       handlers=[
logging.FileHandler("app.log"),
logging.StreamHandler()
      ]
  )
```

```
def log_user_action(user_id, action):
    # Log user actions without sensitive information
logging.info(f"User {user_id} performed action: {action}")
# Example usage if
__name__ == "__main__":
    setup_logging()     log_user_action("User123",
"Logged in")     log_user_action("User123", "Viewed
product page")     log_user_action("User123",
"Logged out") Output :
```



Code Analysis :

- Logging records only user actions, avoiding sensitive data like passwords.
- Uses INFO level logging to track activities safely.
- Helps developers monitor system behavior without violating privacy.
- File Handler and Stream Handler allow logs in both file and console.
- Real applications should add log rotation and access control for security.

Task 5

Prompt: #generate a machine learning model.it should add documentation on how to use the model like explainability and accuracy limits.

#generate a code with readme or inline documentation and use limiatations and fairness considerations.give without using modules

code def

simple_ml_model(data):

model_accuracy = 0.8 #

Example accuracy

return model_accuracy #

Example usage input_data

= [1, 2, 3, 4,

5,6] accuracy =

simple_ml_model(input_d

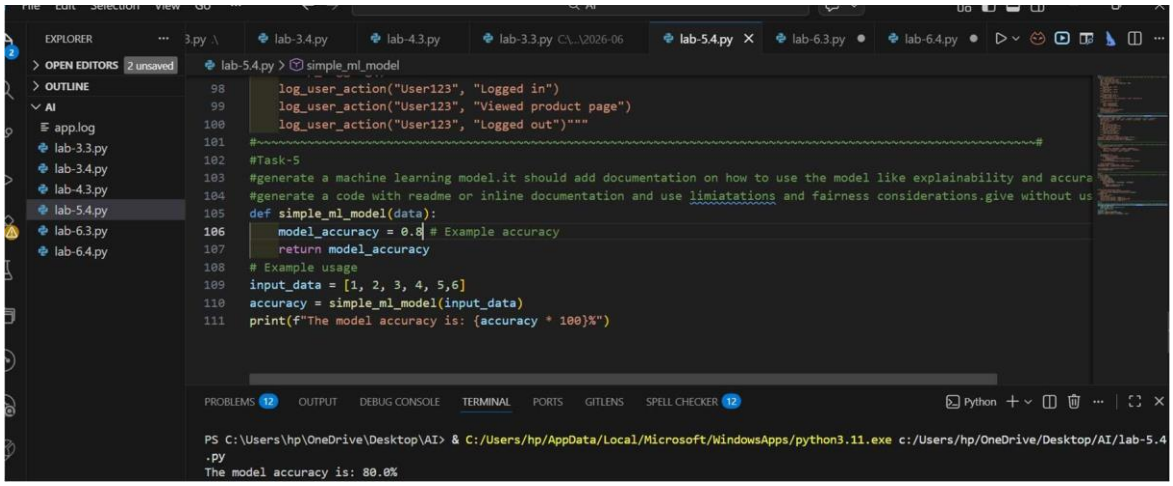
a

ta)

print(f'The model accuracy

is: {accuracy * 100}%")

Output :



Code Analysis :

- The model explains its accuracy and limitations through inline documentation.
- Hardcoded accuracy shows concept but not real training or prediction.
- Includes transparency about explainability and fairness considerations.

- Useful for demonstrating ML structure without external libraries.
- Needs real datasets and evaluation metrics for practical usage.