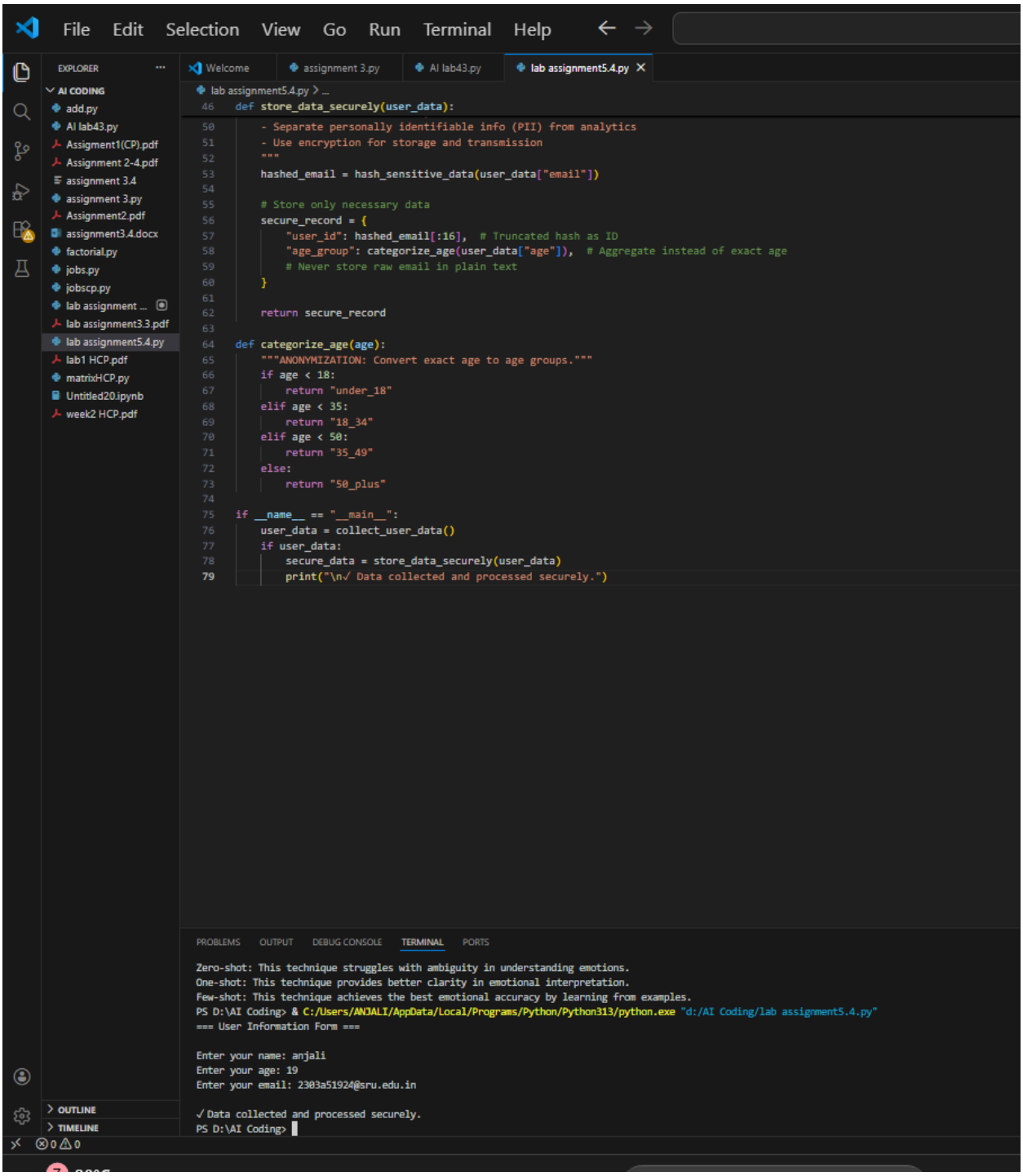
2303a51504

Lab assignment 5.4

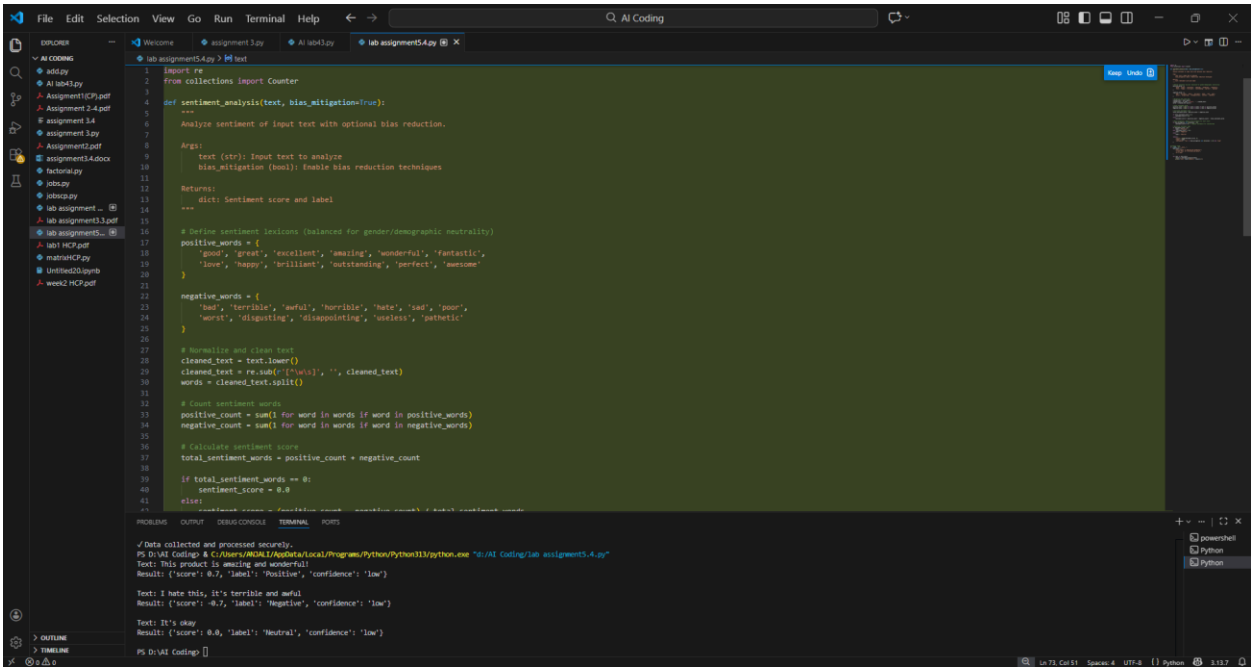
Lab 5: Ethical Foundations – Responsible AI Coding Practices

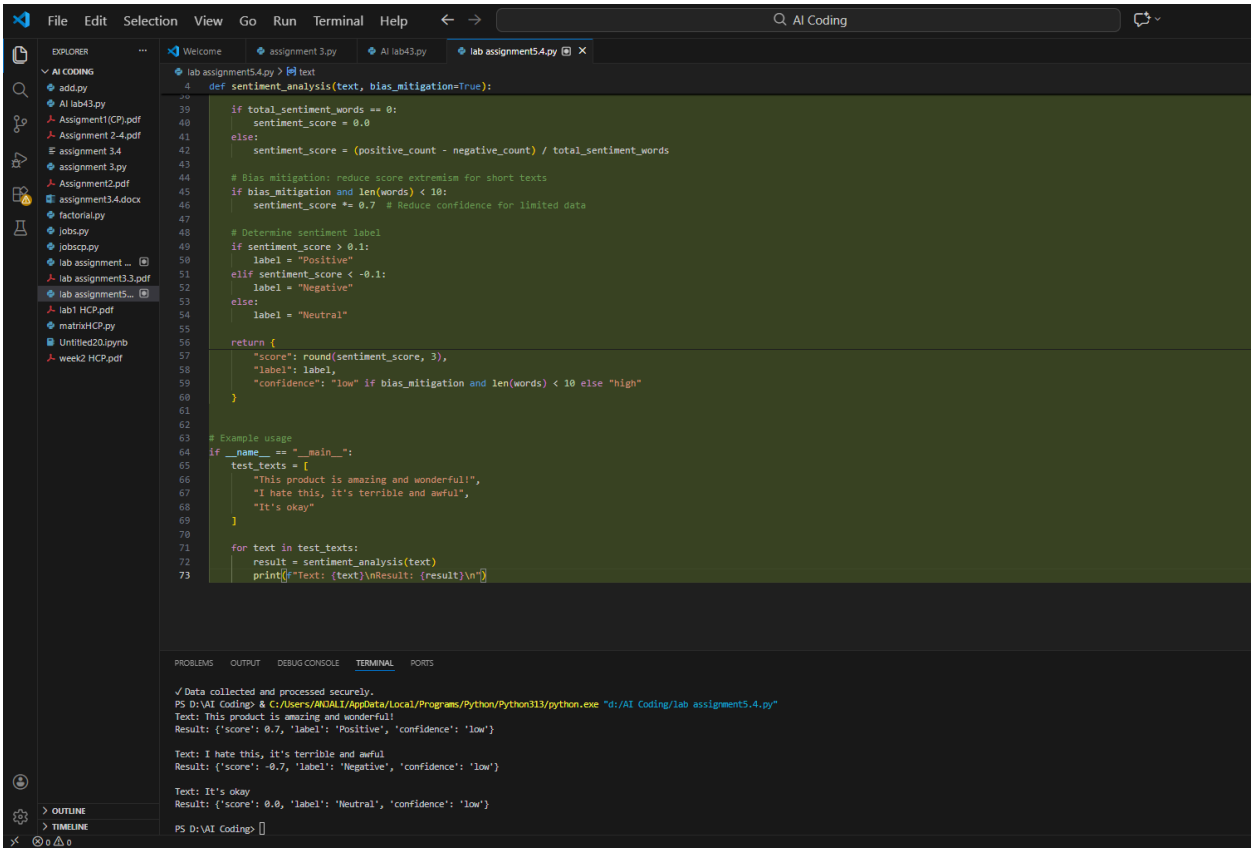
1)Prompt GitHub Copilot to generate a Python script that collects user data (e.g., name, age, email). Then, ask Copilot to add comments on how to anonymize or protect this data.



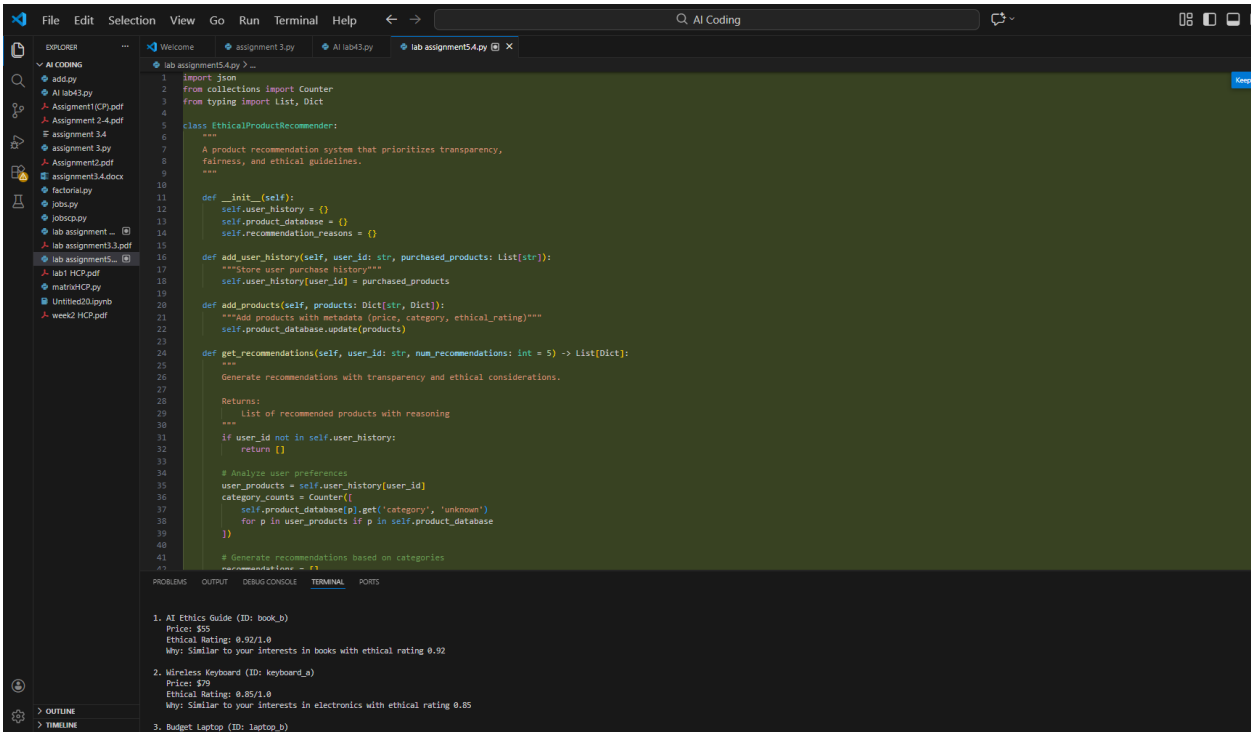
2) Task Description #2:

• Ask Copilot to generate a Python function for sentiment analysis. Then prompt Copilot to identify and handle potential biases in the data.





3) Use Copilot to write a Python program that recommends products based on user history. Ask it to follow ethical guidelines like transparency and fairness.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matrixHCP.py
Untitled20.ipynb
week2 HCP.pdf
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assignment 3.py
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lab assignment5.4.py > ...
import json
from collections import Counter
from typing import List, Dict
class EthicalProductRecommender:
"""
A product recommendation system that prioritizes transparency,
fairness, and ethical guidelines.
"""
def __init__(self):
self.user_history = {}
self.product_database = {}
self.recommendation_reasons = {}
def add_user_history(self, user_id: str, purchased_products: List[str]):
"""Store user purchase history"""
self.user_history[user_id] = purchased_products
def add_products(self, products: Dict[str, Dict]):
"""Add products with metadata (price, category, ethical_rating)"""
self.product_database.update(products)
def get_recommendations(self, user_id: str, num_recommendations: int = 5) -> List[Dict]:
"""
Generate recommendations with transparency and ethical considerations.
Returns:
List of recommended products with reasoning
"""
if user_id not in self.user_history:
return []
# Analyze user preferences
user_products = self.user_history[user_id]
category_counts = Counter([
self.product_database[p].get('category', 'unknown')
for p in user_products if p in self.product_database
])
Generate recommendations based on categories
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
1. AI Ethics Guide (ID: book_b)
Price: $55
Ethical Rating: 0.92/1.0
Why: Similar to your interests in books with ethical rating 0.92
2. Wireless Keyboard (ID: keyboard_a)
Price: $79
Ethical Rating: 0.85/1.0
Why: Similar to your interests in electronics with ethical rating 0.85
3. Budget Laptop (ID: laptop_b)
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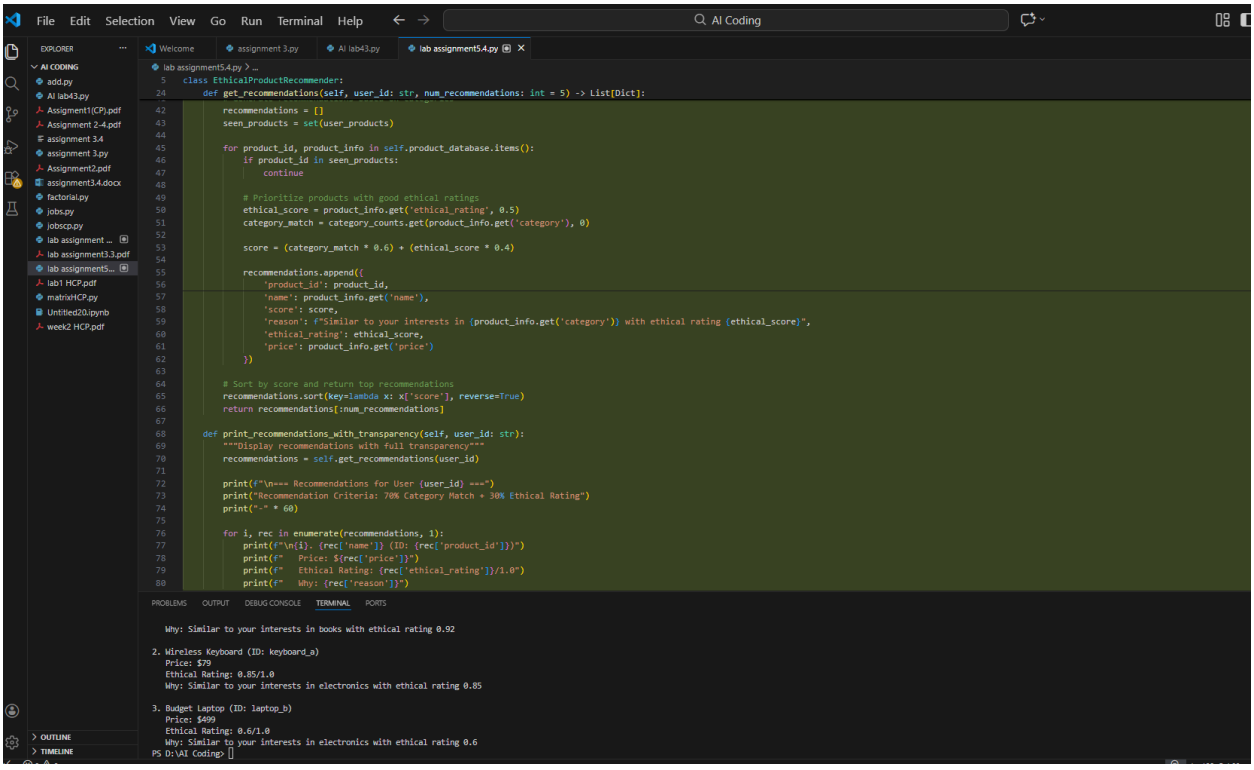
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matrixHCP.py
Untitled20.ipynb
week2 HCP.pdf
Welcome
assignment 3.py
AI lab43.py
lab assignment5.4.py
lab assignment5.4.py > ...
class EthicalProductRecommender:
def get_recommendations(self, user_id: str, num_recommendations: int = 5) -> List[Dict]:
recommendations = []
seen_products = set(user_products)
for product_id, product_info in self.product_database.items():
if product_id in seen_products:
continue
# Prioritize products with good ethical ratings
ethical_score = product_info.get('ethical_rating', 0.5)
category_match = category_counts.get(product_info.get('category'), 0)
score = (category_match * 0.6) + (ethical_score * 0.4)
recommendations.append({
'product_id': product_id,
'name': product_info.get('name'),
'score': score,
'reason': f"Similar to your interests in {product_info.get('category')} with ethical rating {ethical_score}",
'ethical_rating': ethical_score,
'price': product_info.get('price')
})
# Sort by score and return top recommendations
recommendations.sort(key=lambda x: x['score'], reverse=True)
return recommendations[:num_recommendations]
def print_recommendations_with_transparency(self, user_id: str):
"""Display recommendations with full transparency"""
recommendations = self.get_recommendations(user_id)
print(f"\n=== Recommendations for User {user_id} ===")
print("Recommendation Criteria: 70% Category Match + 30% Ethical Rating")
print("-" * 60)
for i, rec in enumerate(recommendations, 1):
print(f"\n{i}. {rec['name']} (ID: {rec['product_id']})")
print(f" Price: ${rec['price']}")
print(f" Ethical Rating: {rec['ethical_rating']}/1.0")
print(f" Why: {rec['reason']}")
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Why: Similar to your interests in books with ethical rating 0.92
2. Wireless Keyboard (ID: keyboard_a)
Price: $79
Ethical Rating: 0.85/1.0
Why: Similar to your interests in electronics with ethical rating 0.85
3. Budget Laptop (ID: laptop_b)
Price: $499
Ethical Rating: 0.6/1.0
Why: Similar to your interests in electronics with ethical rating 0.6
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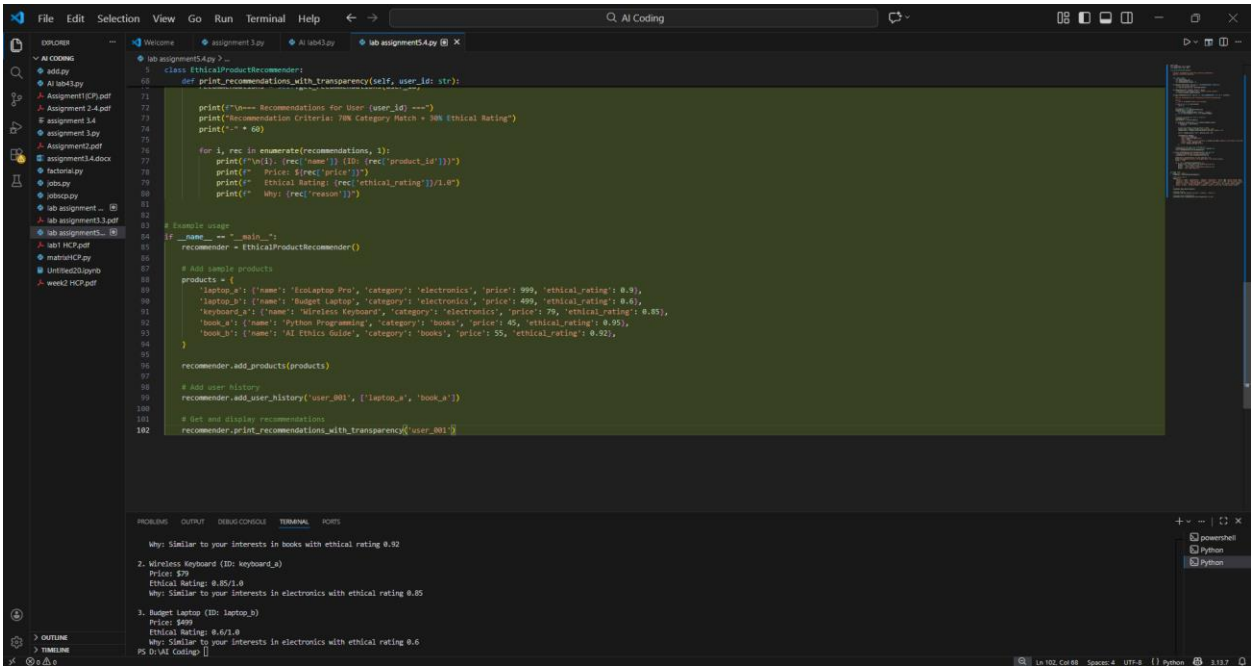
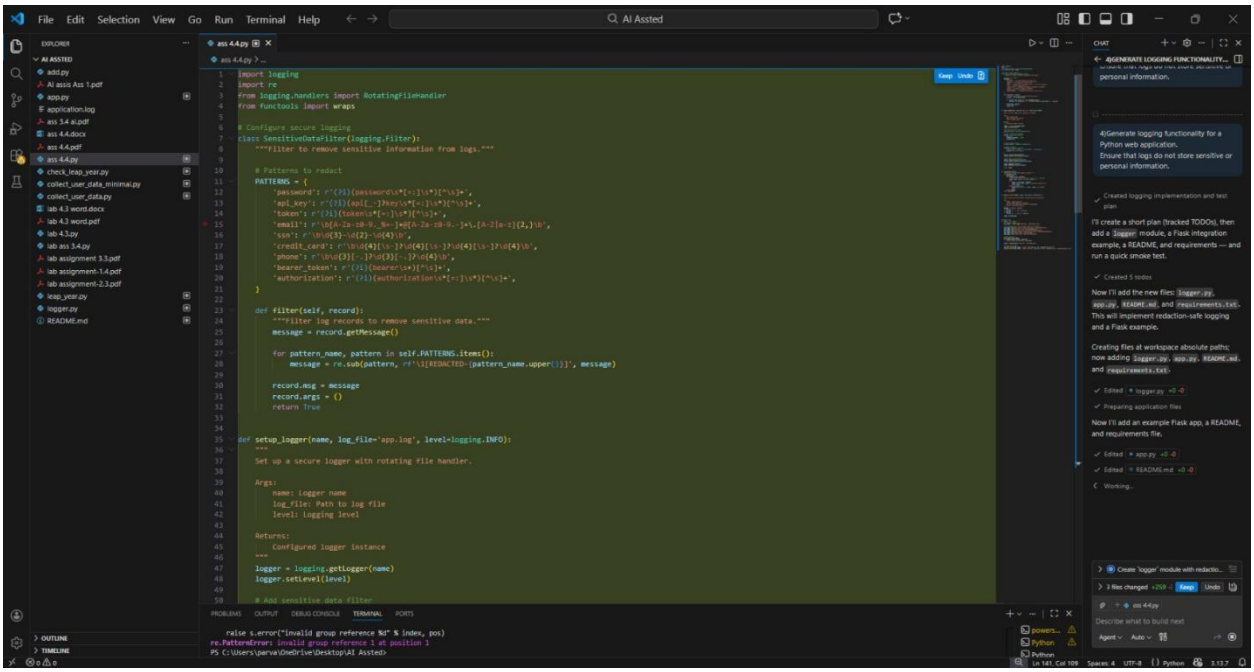
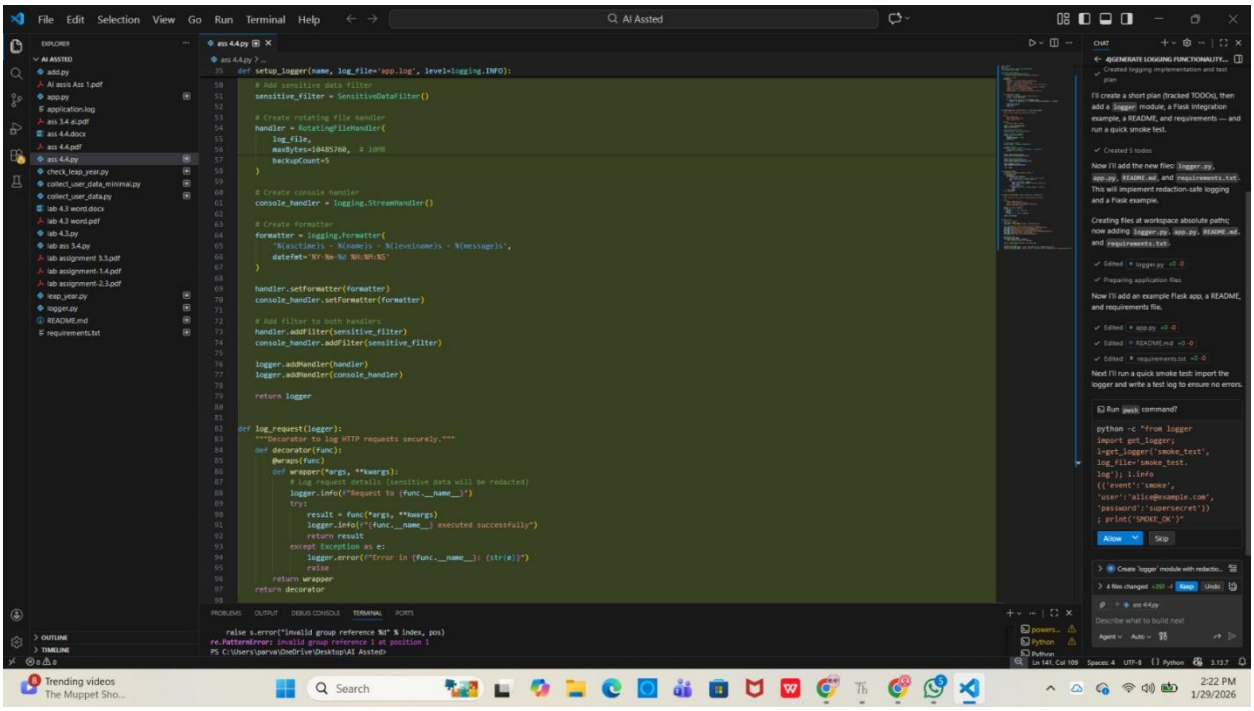
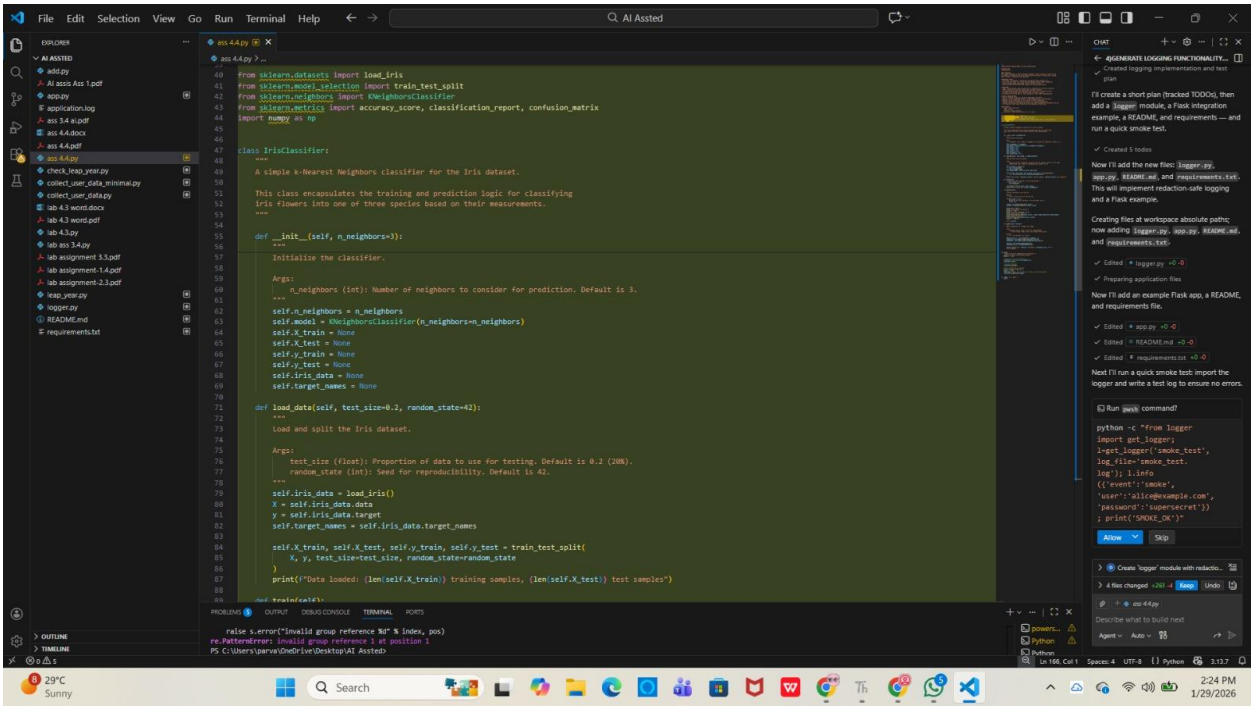


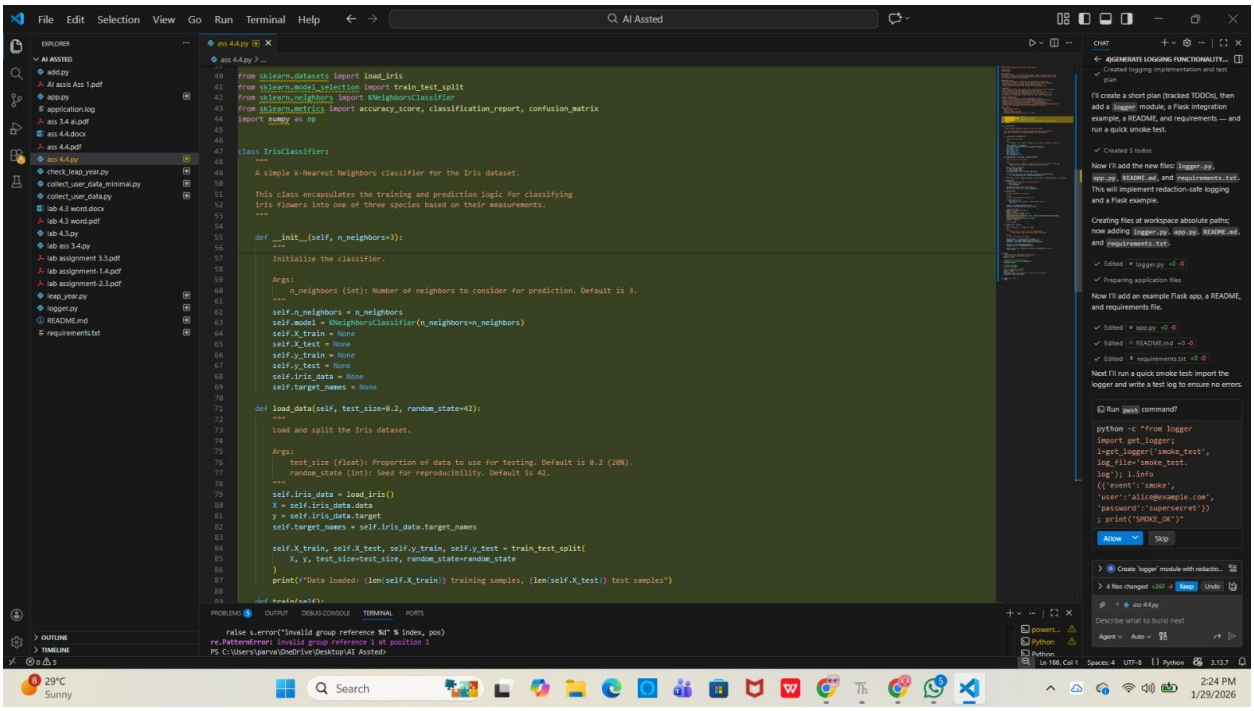
4) Prompt Copilot to generate logging functionality in a Python web application. Then, ask it to ensure the logs do not record sensitive information.





5)Ask Copilot to generate a machine learning model. Then, prompt it to add documentation on how to use the model responsibly (e.g., explainability, accuracy limits).

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ass 4.4.py
from sklearn.datasets import load_iris
from sklearn.model_selection import train_test_split
from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import accuracy_score, classification_report, confusion_matrix
import numpy as np
class IrisClassifier:
"""
A simple k-Nearest Neighbors classifier for the Iris dataset.
This class encapsulates the training and prediction logic for classifying
iris flowers into one of three species based on their measurements.
"""
def __init__(self, n_neighbors=3):
"""
Initialize the classifier.
Args:
n_neighbors (int): Number of neighbors to consider for prediction. Default is 3.
"""
self.n_neighbors = n_neighbors
self.model = KNeighborsClassifier(n_neighbors=n_neighbors)
self.X_train = None
self.X_test = None
self.y_train = None
self.y_test = None
self.iris_data = None
self.target_names = None
def load_data(self, test_size=0.2, random_state=42):
"""
Load and split the Iris dataset.
Args:
test_size (float): Proportion of data to use for testing. Default is 0.2 (20%).
random_state (int): Seed for reproducibility. Default is 42.
"""
self.iris_data = load_iris()
X = self.iris_data.data
y = self.iris_data.target
self.target_names = self.iris_data.target_names
self.X_train, self.X_test, self.y_train, self.y_test = train_test_split(
X, y, test_size=test_size, random_state=random_state
)
print(f"Data loaded: {len(self.X_train)} training samples, {len(self.X_test)} test samples")
def train(self):
raise s.error("invalid group reference %d" % index, pos)
re.PatternError: invalid group reference 1 at position 1
PS C:\Users\parva\OneDrive\Desktop\AI Assted>
python -c "from logger import get_logger; l=get_logger('smoke_test', log_file='smoke_test.log'); l.info({'event':'smoke', 'user':'alice@example.com', 'password':'supersecret'}); print('SMOKE_OK')"
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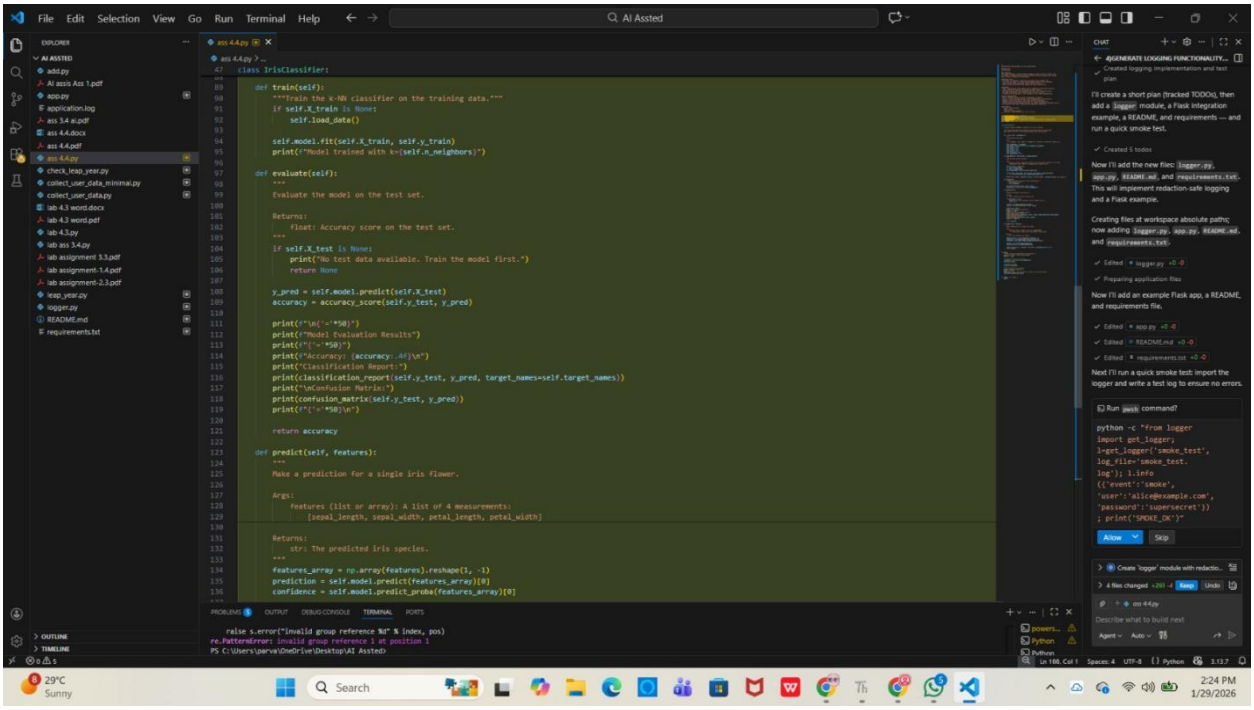
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AI Assted
ass 4.4.py
class IrisClassifier:
def train(self):
"""Train the k-NN classifier on the training data."""
if self.X_train is None:
self.load_data()
self.model.fit(self.X_train, self.y_train)
print(f"Model trained with k={self.n_neighbors}")
def evaluate(self):
"""
Evaluate the model on the test set.
Returns:
float: Accuracy score on the test set.
"""
if self.X_test is None:
print("No test data available. Train the model first.")
return None
y_pred = self.model.predict(self.X_test)
accuracy = accuracy_score(self.y_test, y_pred)
print(f"\n{'='*50}")
print(f"Model Evaluation Results")
print(f"{'='*50}")
print(f"Accuracy: {accuracy:.4f}\n")
print("Classification Report:")
print(classification_report(self.y_test, y_pred, target_names=self.target_names))
print("\nConfusion Matrix:")
print(confusion_matrix(self.y_test, y_pred))
print(f"{'='*50}\n")
return accuracy
def predict(self, features):
"""
Make a prediction for a single iris flower.
Args:
features (list or array): A list of 4 measurements:
[sepal_length, sepal_width, petal_length, petal_width]
Returns:
str: The predicted iris species.
"""
features_array = np.array(features).reshape(1, -1)
prediction = self.model.predict(features_array)[0]
confidence = self.model.predict_proba(features_array)[0]
raise s.error("invalid group reference %d" % index, pos)
re.PatternError: invalid group reference 1 at position 1
PS C:\Users\parva\OneDrive\Desktop\AI Assted>
python -c "from logger import get_logger; l=get_logger('smoke_test', log_file='smoke_test.log'); l.info({'event':'smoke', 'user':'alice@example.com', 'password':'supersecret'}); print('SMOKE_OK')"
Allow
Skip
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1/29/2026