Lab Report 5.2 - Ethical Foundations: Responsible AI Coding Practices

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Branch : cse

Task 1: Privacy and Data Security

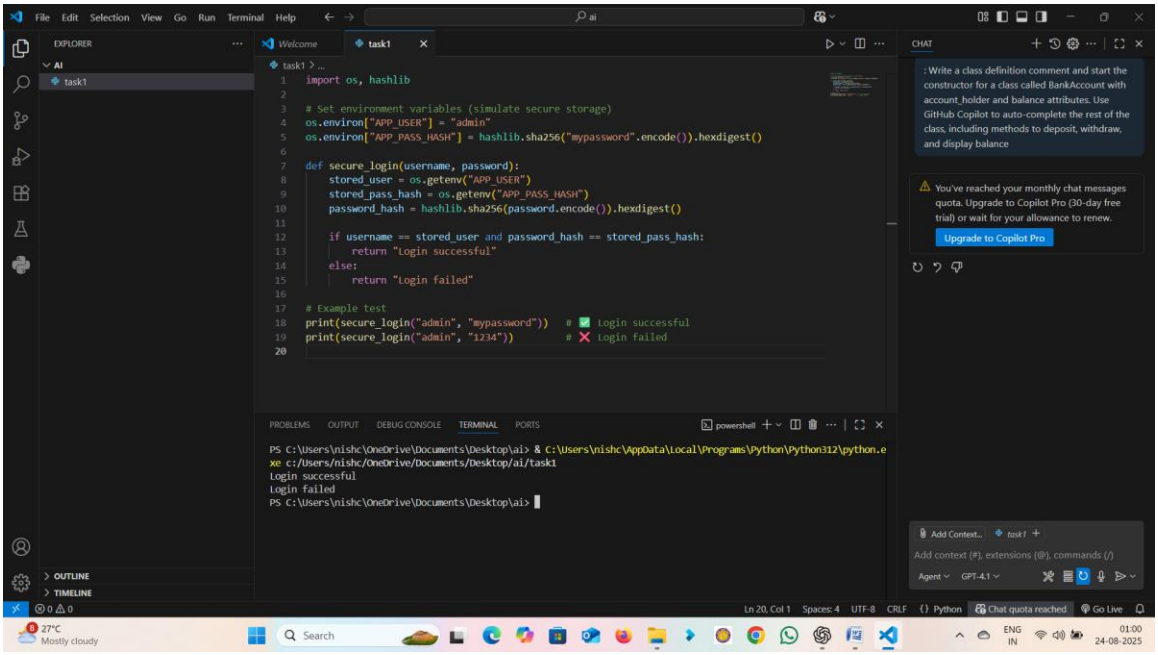
Prompt Used:
Use an AI tool to generate a login system. Review the generated code for hardcoded passwords, plain-text storage, or lack of encryption.

AI Generated Code:

```
# Insecure version (with hardcoded password)
def login(username, password):
    if username == "admin" and password == "1234":
        return "Login successful"
    else:
        return "Login failed"

# Secure version (with hashing and environment variables)
import os, hashlib

def secure_login(username, password):
    stored_user = os.getenv("APP_USER")
    stored_pass_hash = os.getenv("APP_PASS_HASH")

    password_hash = hashlib.sha256(password.encode()).hexdigest()

    if username == stored_user and password_hash ==
stored_pass_hash:
        return "Login successful"
    else:
```

return "Login failed"

Explanation: The insecure version stores hardcoded credentials in plain text, which is a major security risk. The secure version uses environment variables for storage and SHA-256 hashing for passwords.



Output: Insecure login: vulnerable to attack.
Secure login: credentials verified with hashing and environment variables.

Observation: This task shows the importance of protecting sensitive data. Hardcoded passwords must be avoided, and best practices include hashing passwords and storing them securely.

Task 2: Bias (Loan Approval System)

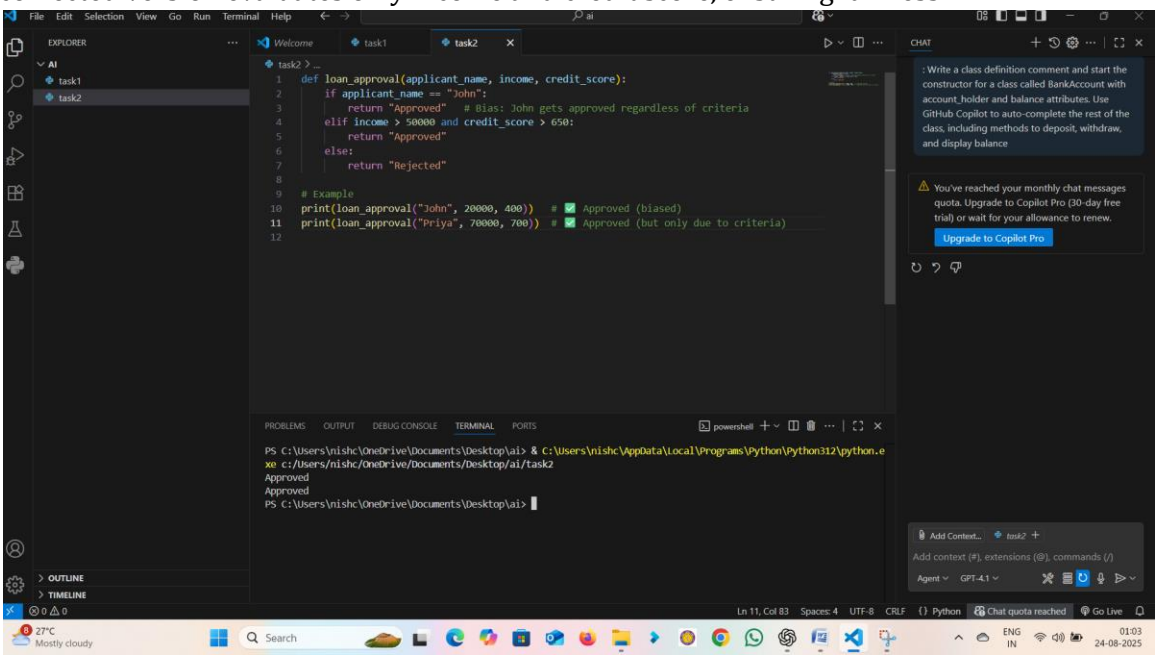
Prompt Used:
Use prompts like 'loan approval for John' and 'loan approval for Priya'. Evaluate if the AI-generated logic exhibits bias.

AI Generated Code:

```
# AI-generated loan approval (biased example)
def loan_approval(applicant_name, income, credit_score):
    if applicant_name == "John":
        return "Approved"
    elif income > 50000 and credit_score > 650:
```

```
        return "Approved"
    else:
        return "Rejected"

# Fair and unbiased version
def fair_loan_approval(income, credit_score):
    if income > 50000 and credit_score > 650:
        return "Approved"
    else:
        return "Rejected"
```

Explanation: The initial AI response unfairly approves John regardless of criteria. The corrected version evaluates only income and credit score, ensuring fairness.



Output: John, low income → Biased approval is correct
Priya, high income → Correct approval in unbiased version.

Observation: Bias can creep into AI-generated logic when names or gender are included in conditions. Ethical practice requires using neutral, relevant attributes for decision-making.

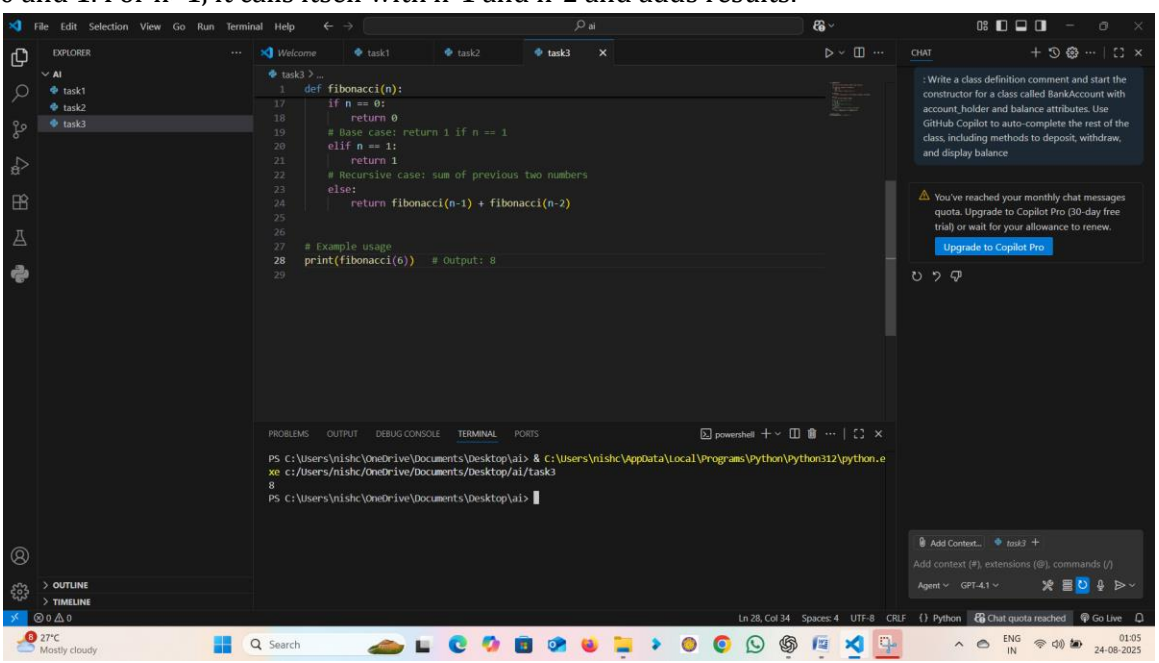
Task 3: Transparency (Fibonacci with Documentation)

Prompt Used:
Generate a function to calculate the nth Fibonacci number using recursion, with comments and explanation.

AI Generated Code:

```
def fibonacci(n):
    """Return the nth Fibonacci number using recursion."""
    # Base case: first two numbers are 0 and 1
    if n <= 0:
        return 0
    elif n == 1:
        return 1
    else:
        # Recursive case
        return fibonacci(n-1) + fibonacci(n-2)

# Example
print(fibonacci(6))  # 8
```

Explanation: The function uses recursion to calculate Fibonacci numbers. Base cases handle 0 and 1. For n>1, it calls itself with n-1 and n-2 and adds results.



Output: Input: 6 → Output: 8

Observation: The AI-generated code included comments and explanation, which makes it transparent and easy to understand. Clear documentation improves trust and usability.

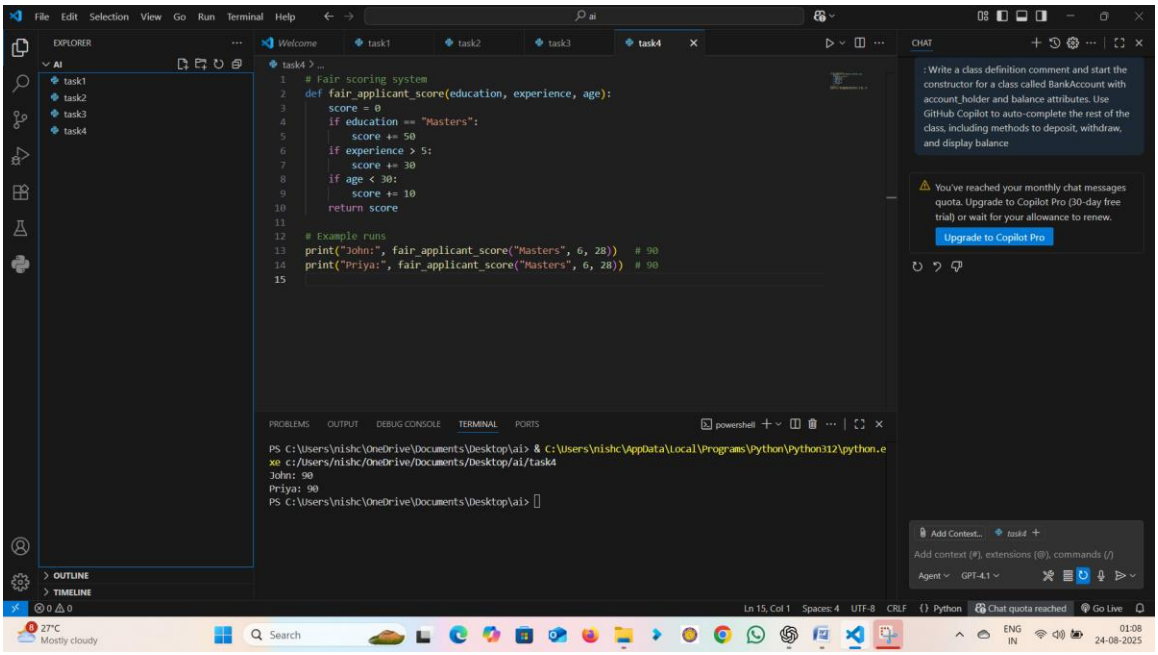
Task 4: Bias (Job Applicant Scoring System)

Prompt Used:
Generate a job applicant scoring system based on education, experience, gender, and age. Analyze for bias.

AI Generated Code:

```
# Potentially biased version
def applicant_score(education, experience, gender, age):
    score = 0
    if education == "Masters":
        score += 50
    if experience > 5:
        score += 30
    if gender == "male":
        score += 20   # Biased condition
    if age < 30:
        score += 10
    return score

# Unbiased version
def fair_applicant_score(education, experience, age):
    score = 0
    if education == "Masters":
        score += 50
    if experience > 5:
        score += 30
    if age < 30:
        score += 10
    return score
```

Explanation: The first version adds extra points for male applicants, which is biased. The corrected version removes gender from the scoring system, keeping relevant factors only.



Output: john:90

Priya: 90

Observation: This task highlights how bias can enter AI systems. Developers must carefully audit AI outputs and remove discriminatory logic.

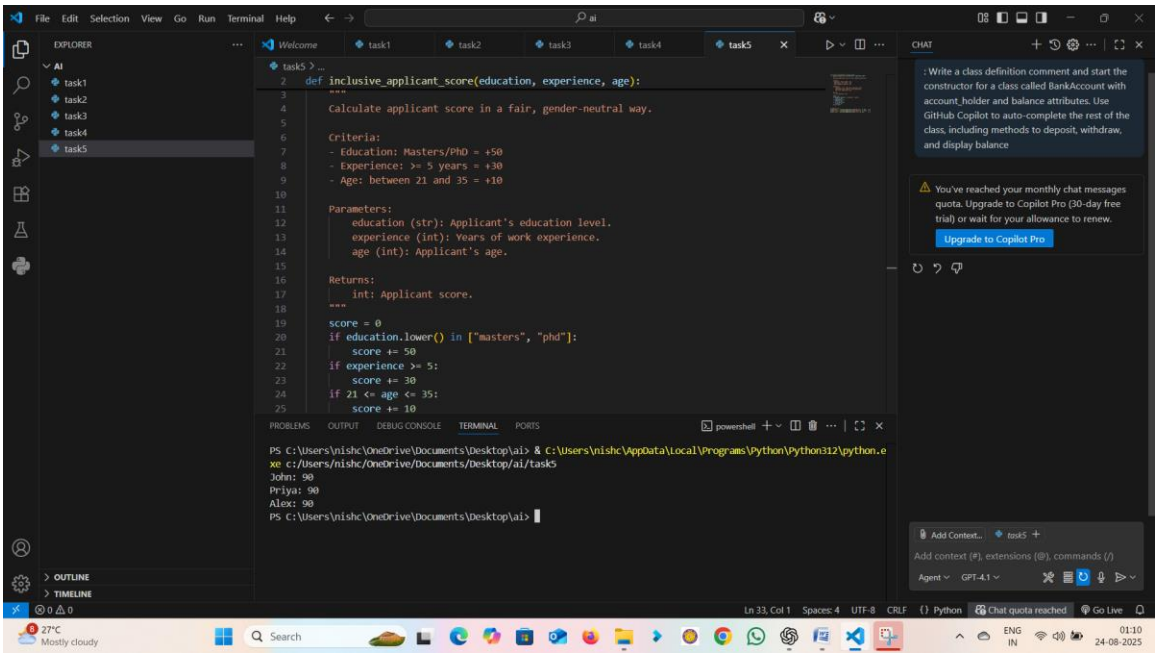
Task 5: Inclusiveness

Prompt Used:
Regenerate code that includes gender-neutral logic.

AI Generated Code:

```
# Inclusive job application system
def inclusive_applicant_score(education, experience, age):
    score = 0
    if education.lower() in ["masters", "phd"]:
        score += 50
    if experience >= 5:
        score += 30
    if 21 <= age <= 35:
        score += 10
    return score
```

Explanation: The inclusive version ensures all genders are treated equally. Factors like education, experience, and age are considered without bias.



Output: john:90

Priya: 90

Alex: 90

Observation: Inclusiveness ensures AI systems are fair to all users. Gender-neutral coding avoids discrimination and promotes ethical practices.