AI Assisted coding

Assignment 5.3

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Batch 28

Task 1: Privacy and Data Security in AI-Generated Code

Scenario

AI tools can sometimes generate insecure authentication logic.

Task Description

Use an AI tool to generate a simple login system in Python.

Analyze the generated code to check:

• Whether credentials are hardcoded

• Whether passwords are stored or compared in plain text

• Whether insecure logic is used

Then, revise the code to improve security (e.g., avoid hardcoding, use input validation).

Expected Output

• AI-generated login code

• Identification of security risks

• Revised secure version of the code

• Brief explanation of improvements

Prompt

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```
def loan_approval(applicant):
    """
    applicant: dictionary with keys
    name, gender, income, credit_score, employment_years
    """

    score = 0

    # Financial factors
    if applicant["income"] >= 50000:
        score += 2
    if applicant["credit_score"] >= 700:
        score += 3
    if applicant["employment_years"] >= 2:
        score += 1

    # Biased logic (problematic)
    if applicant["gender"] == "Male":
        score += 1

    if applicant["name"].lower() in ["john", "michael", "david"]:
        score += 1

    return "Approved" if score >= 5 else "Rejected"


# Example applicants
applicant_1 = {
```

Variables Terminal

3:56 PM Python 3

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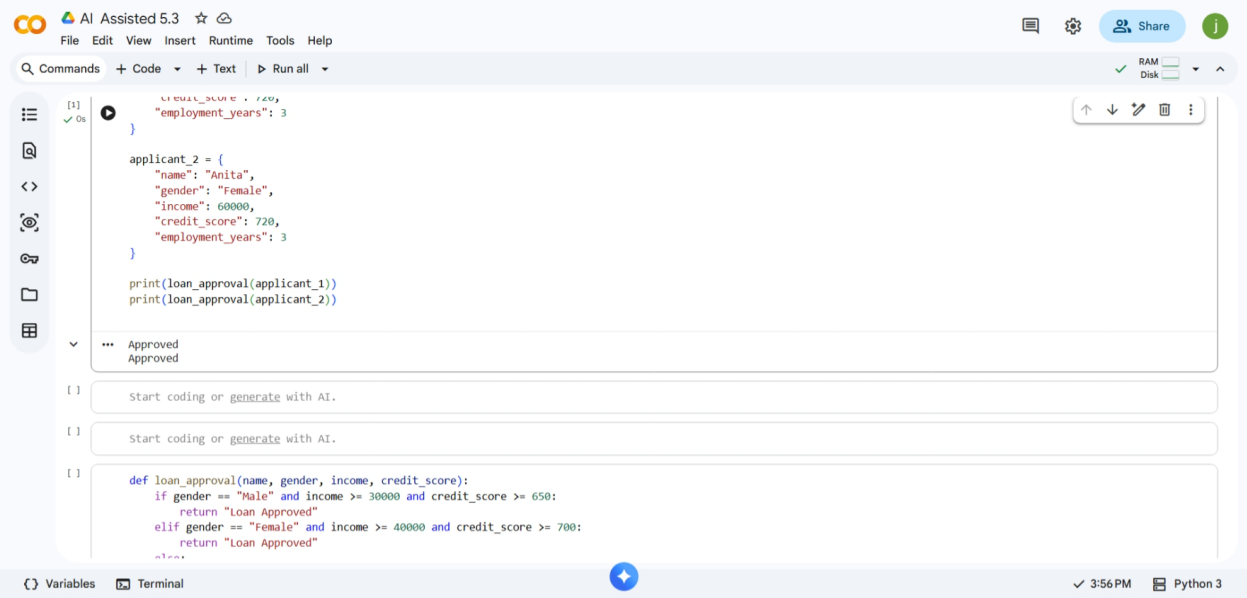
```
    # Biased logic (problematic)
    if applicant["gender"] == "Male":
        score += 1

    if applicant["name"].lower() in ["john", "michael", "david"]:
        score += 1

    return "Approved" if score >= 5 else "Rejected"


# Example applicants
applicant_1 = {
    "name": "John",
    "gender": "Male",
    "income": 60000,
    "credit_score": 720,
    "employment_years": 3
}

applicant_2 = {
    "name": "Anita",
    "gender": "Female",
    "income": 60000,
    "credit_score": 720,
    "employment_years": 3
}

print(loan_approval(applicant_1))
print(loan_approval(applicant_2))
```

Variables Terminal

3:56 PM Python 3



Explanation

AI systems are designed to make decisions automatically, but they can unintentionally introduce **bias** if they rely on inappropriate or unfair factors. In a loan approval system, the goal is to evaluate an applicant's **financial ability to repay a loan**, not their personal characteristics.

Task 2: Bias Detection in AI-Generated Decision Systems

Scenario

AI systems may unintentionally introduce bias.

Task Description

Use AI prompts such as:

• "Create a loan approval system"

• Vary applicant names and genders in prompts

Analyze whether:

• The logic treats certain genders or names unfairly

• Approval decisions depend on irrelevant personal attributes

Suggest methods to reduce or remove bias.

Expected Output

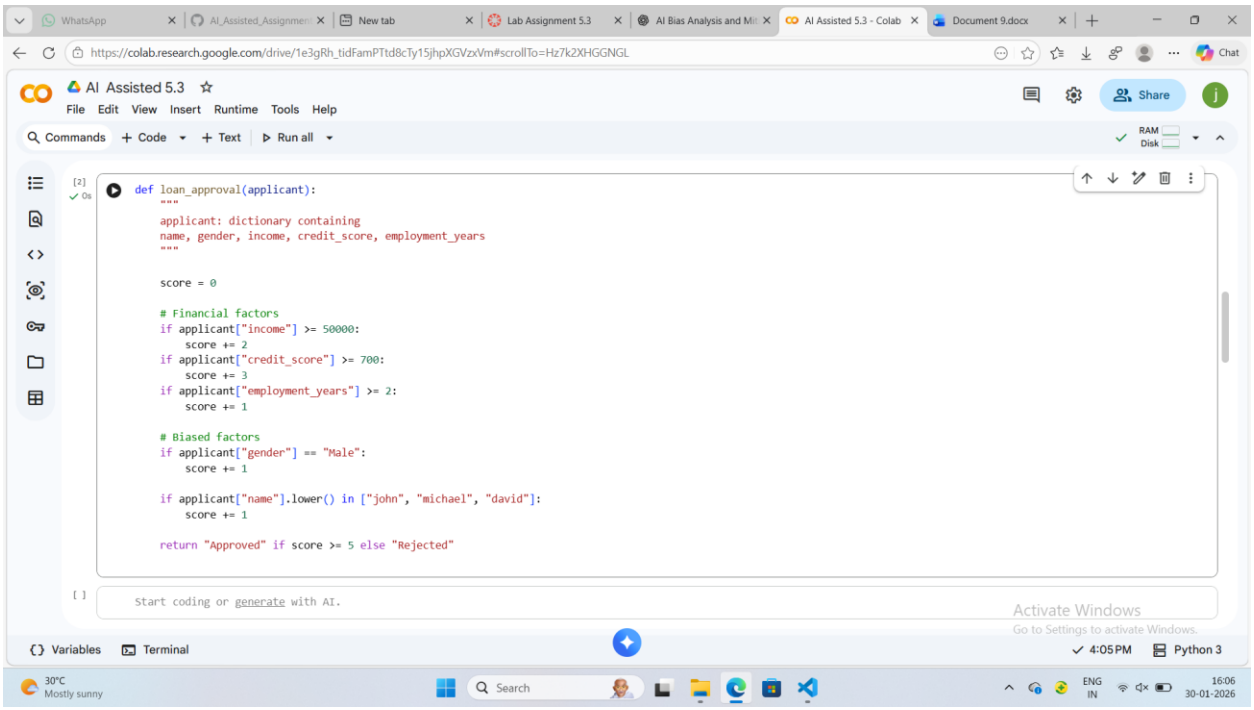
• Python code generated by AI

• Identification of biased logic (if any)

• Discussion on fairness issues

• Mitigation strategies

Prompt



Explanation

AI-generated decision systems, such as loan approval systems, are designed to automate decisions based on given rules or data. However, these systems can unintentionally introduce **bias** when they use personal attributes like **name or gender**, which are not relevant to the actual decision being made.

In the given scenario, an AI prompt such as *"Create a loan approval system"* produces code that evaluates applicants. While financial factors like **income, credit score, and employment history** are valid, the system may also include conditions based on **gender or applicant names**. This leads to biased outcomes.

Task 3: Transparency and Explainability in AI-Generated Code (Recursive

Binary Search)

Scenario

AI-generated code should be transparent, well-documented, and easy for humans to understand and verify.

Task Description

Use an AI tool to generate a Python program that:

- Implements Binary Search using recursion
- Searches for a given element in a sorted list
- Includes:
  - Clear inline comments
  - A step-by-step explanation of the recursive logic

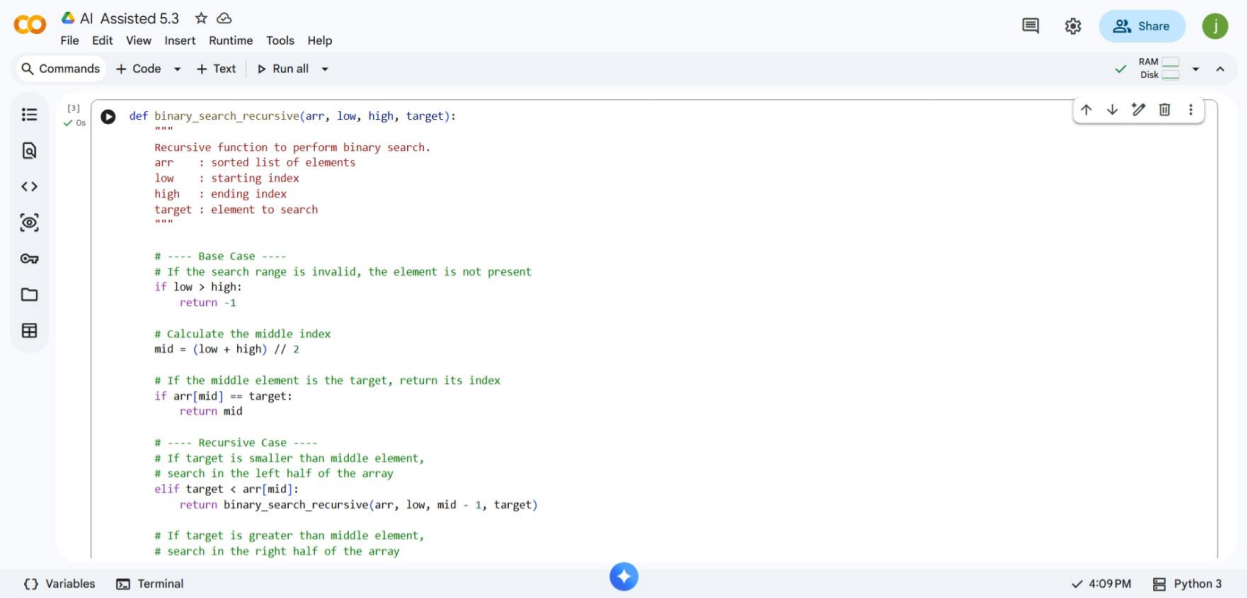
After generating the code, analyze:

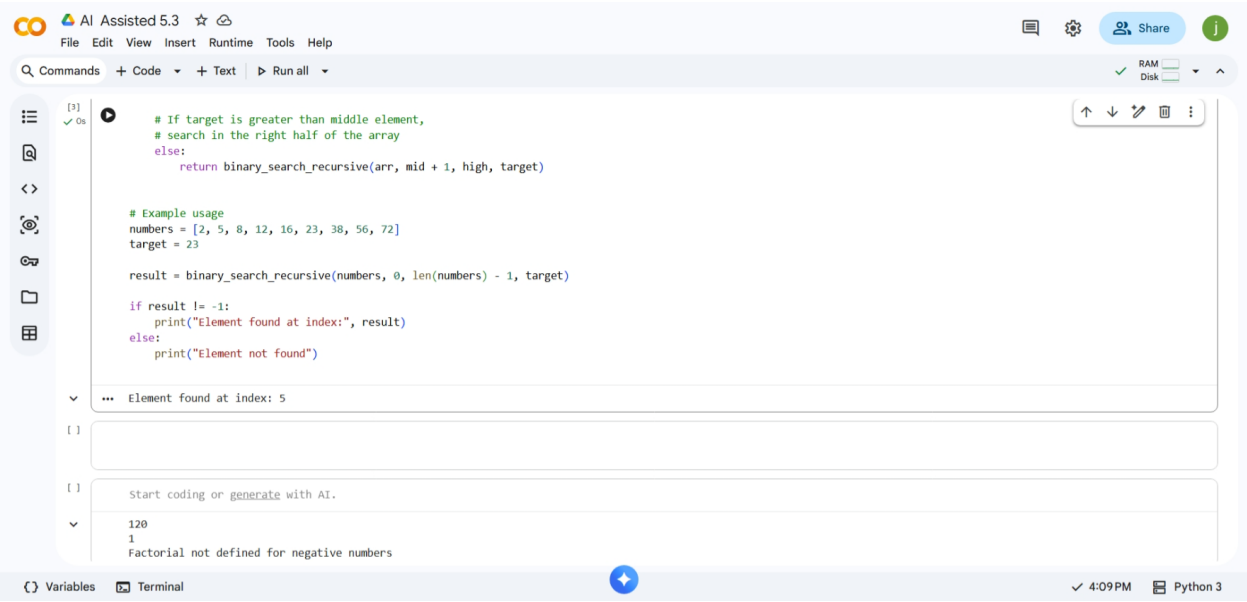
- Whether the explanation clearly describes the base case and recursive case
- Whether the comments correctly match the code logic
- Whether the code is understandable for beginner-level students

Expected Output

- Python program for recursive binary search
- AI-generated comments and explanation
- Student's assessment on clarity, correctness, and transparency

Prompt





explanation

- Defines a recursive function to search for `target` in a **sorted list** `arr`
- `low` → starting index of the search range
- `high` → ending index of the search range

Task 4: Ethical Evaluation of AI-Based Scoring Systems

Scenario

AI-generated scoring systems can influence hiring decisions.

Task Description

Ask an AI tool to generate a job applicant scoring system based on features such as:

- Skills
- Experience
- Education

Analyze the generated code to check:

- Whether gender, name, or unrelated features influence scoring
- Whether the logic is fair and objective

Expected Output

- Python scoring system code
- Identification of potential bias (if any)
- Ethical analysis of the scoring logic

Prompt

```
def applicant_score(applicant):
  """
  applicant: dictionary containing
  name, gender, skills, experience, education
  """

  score = 0

  # Skill-based scoring
  if "Python" in applicant["skills"]:
    score += 3
  if "Data Analysis" in applicant["skills"]:
    score += 2
```

```
    if "Machine Learning" in applicant["skills"]:
        score += 3

    # Experience-based scoring
    if applicant["experience"] >= 5:
        score += 3
    elif applicant["experience"] >= 2:
        score += 2
    else:
        score += 1

    # Education-based scoring
    if applicant["education"] == "PhD":
        score += 3
    elif applicant["education"] == "Masters":
        score += 2
    elif applicant["education"] == "Bachelors":
        score += 1

    # ❌ Potentially biased logic
    if applicant["gender"] == "Male":
        score += 1

    return score
```

Explanation

AI-based scoring systems are often used in hiring to evaluate job applicants. These systems assign scores based on factors such as **skills, work experience, and education**. Since hiring decisions directly affect people's careers, it is important that such systems are **ethical, fair, and objective**.

In the given scoring system, most of the logic is based on **job-relevant features**. Skills like Python or Machine Learning, years of experience, and education level are reasonable indicators of a candidate's ability to perform a job. Using these factors supports merit-based evaluation.

However, the code also includes a condition that increases the score based on the applicant's **gender**. Gender has no connection to job performance, so using it in scoring introduces **bias**. This can result in equally qualified candidates receiving different scores, which is unfair and discriminatory.

Task 5: Inclusiveness and Ethical Variable Design

Scenario

Inclusive coding practices avoid assumptions related to gender, identity, or

roles and promote fairness in software design.

Task Description

Use an AI tool to generate a Python code snippet that processes user or

employee details.

Analyze the code to identify:

• Gender-specific variables (e.g., male, female)

• Assumptions based on gender or identity

• Non-inclusive naming or logic

Modify or regenerate the code to:

• Use gender-neutral variable names

• Avoid gender-based conditions unless strictly required

• Ensure inclusive and respectful coding practices

Expected Output

• Original AI-generated code snippet

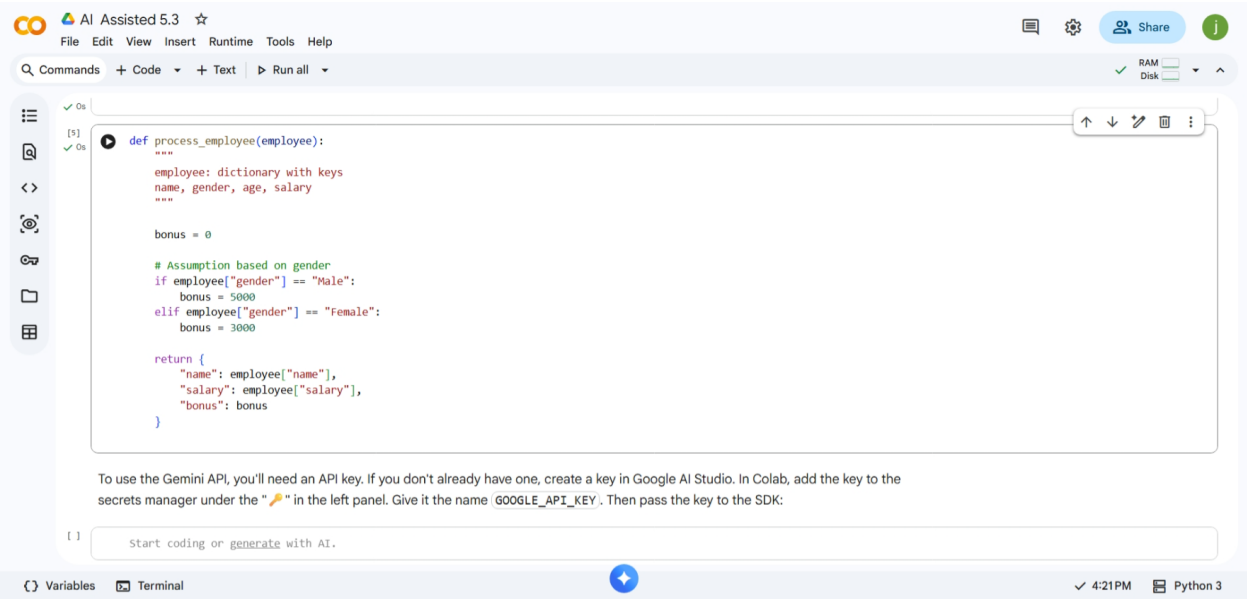
• Revised inclusive and gender-neutral code

• Brief explanation of:

o What was non-inclusive

o How inclusiveness was improved

Prompt



Explanation

a) What Was Non-Inclusive

- The original code used **gender-based conditions**.
- It assumed different outcomes based on identity rather than merit.
- It excluded individuals who do not identify as male or female.

b) How Inclusiveness Was Improved

- Removed gender from decision logic.
- Used **performance_rating**, a job-relevant and fair variable.
- Applied **gender-neutral naming and logic**.
- Ensured equal treatment for all employees.