

ASSIGNMENT-5.3

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BATCH: 41

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

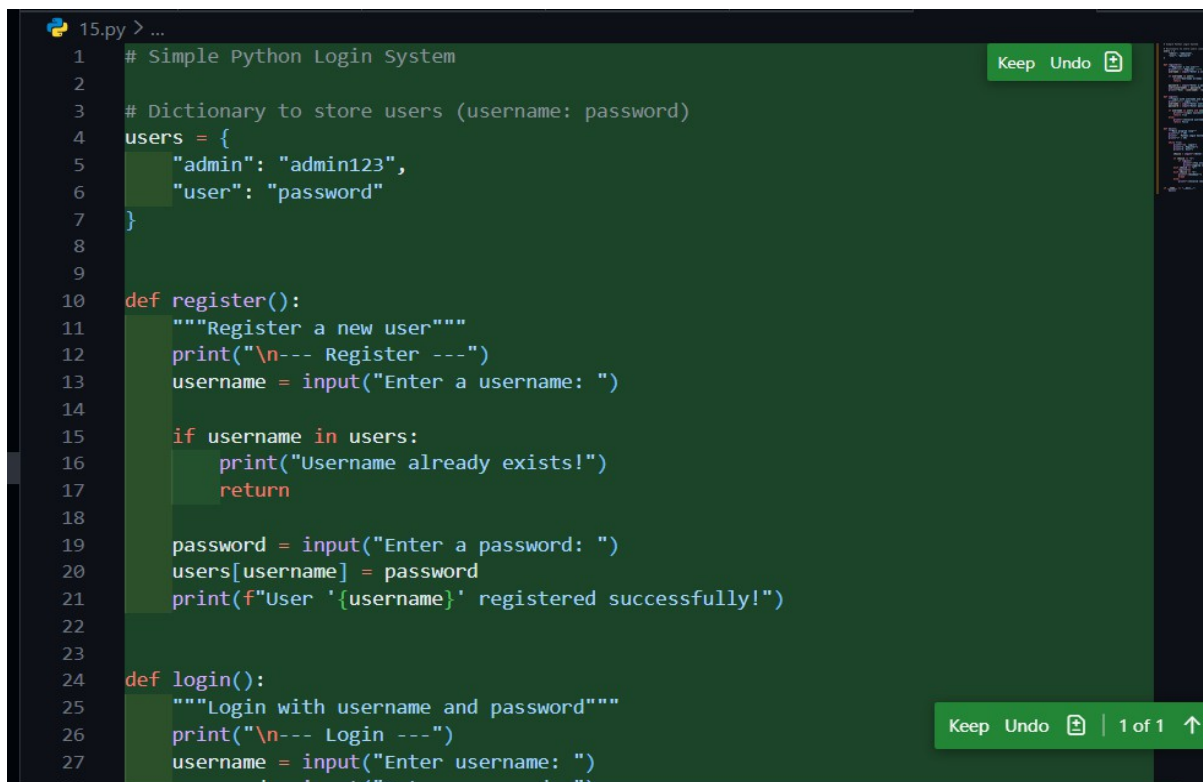
Objective:

To analyze AI-generated login code for security flaws and revise it to follow responsible and secure coding practices.

Prompt Used for AI Tool:

Generate a simple Python login system for username and password authentication.

Generated code:



```
15.py > ...
1  # Simple Python Login System
2
3  # Dictionary to store users (username: password)
4  users = {
5      "admin": "admin123",
6      "user": "password"
7  }
8
9
10 def register():
11     """Register a new user"""
12     print("\n--- Register ---")
13     username = input("Enter a username: ")
14
15     if username in users:
16         print("Username already exists!")
17         return
18
19     password = input("Enter a password: ")
20     users[username] = password
21     print(f"User '{username}' registered successfully!")
22
23
24 def login():
25     """Login with username and password"""
26     print("\n--- Login ---")
27     username = input("Enter username: ")
28     password = input("Enter password: ")
29     if username in users and users[username] == password:
30         print("Login successful!")
31     else:
32         print("Invalid username or password!")
33
34 if __name__ == "__main__":
35     register()
36     login()
```

```
15.py > ...
24 def login():
25     """Login with username and password"""
26     print("\n--- Login ---")
27     username = input("Enter username: ")
28     password = input("Enter password: ")
29
30     if username in users and users[username] == password:
31         print(f"\nLogin successful! Welcome, {username}!")
32         return True
33     else:
34         print("\nInvalid username or password!")
35         return False
36
37
38 def main():
39     """Main program loop"""
40     print("=" * 40)
41     print("  Python Login System")
42     print("=" * 40)
43
44     while True:
45         print("\n1. Login")
46         print("2. Register")
47         print("3. Exit")
48
49         choice = input("\nEnter your choice (1-3): ")
50
```

```

3
9         choice = input("\nEnter your choice (1-3): ")
0
1         if choice == "1":
2             if login():
3                 print("\nYou are now logged in!")
4                 print("Logging out...")
5             elif choice == "2":
6                 register()
7             elif choice == "3":
8                 print("\nGoodbye!")
9                 break
0             else:
1                 print("\nInvalid choice! Please try again.")
2
3
4 if __name__ == "__main__":
5     main()
6
```

Output:

```
=====
Python Login System
=====

1. Login
2. Register
3. Exit

Enter your choice (1-3): 1

--- Login ---
Enter username: admin
Enter password: admin123

Login successful! Welcome, admin!

You are now logged in!
```

For wrong credentials

```
PROBLEMS 3 OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS SONARQUBE 3

1. Login
2. Register
3. Exit

Enter your choice (1-3): 1

--- Login ---
Enter username: admin
Enter password: admin1234

Invalid username or password!
```

Security Issues Identified

1. Hardcoded Credentials
 - Username and password are directly written in the source code.
 - Anyone with access to the code can see the credentials.
2. Plain-Text Password Comparison
 - Password is stored and compared in plain text.
 - Vulnerable to password leakage and attacks.
3. No Input Validation
 - No checks for empty or invalid input.
4. No Password Hashing
 - Violates standard authentication security practices.

Improved code with security

```
15.py > ...
1  import hashlib
2
3  # Storing hashed password instead of plain text
4  stored_username = "admin"
5  stored_password_hash = hashlib.sha256("admin123".encode()).hexdigest()
6
7  input_username = input("Enter username: ").strip()
8  input_password = input("Enter password: ").strip()
9
10 # Hashing user-entered password
11 input_password_hash = hashlib.sha256(input_password.encode()).hexdigest()
12
13 if input_username == stored_username and input_password_hash == stored_password_hash:
14     print("Login successful")
15 else:
16     print("Invalid credentials")
17
```

Output for correct credentials

```
PROBLEMS 3 OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS SONARQUBE 3 Python + v [ ] [ ] ... | [ ]
PS C:\Users\s9409\Downloads\aiassitantcoding> & C:/Users/s9409/AppData/Local/Programs/Python/Python313/python.exe c:/Users/s9409/Downloads/aiassitantcoding/15.py
Enter username: admin
Enter password: admin123
Login successful
PS C:\Users\s9409\Downloads\aiassitantcoding>
```

For wrong credentials

```
PROBLEMS 3 OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS SONARQUBE 3 Python + v [ ] [ ] ... | [ ]
PS C:\Users\s9409\Downloads\aiassitantcoding> & C:/Users/s9409/AppData/Local/Programs/Python/Python313/python.exe c:/Users/s9409/Downloads/aiassitantcoding/15.py
Enter username: admin
Enter password: test
Invalid credentials
PS C:\Users\s9409\Downloads\aiassitantcoding>
```

Justification for improved code

1. Password Hashing

- SHA-256 hashing is used to prevent storing passwords in plain text.
- Even if data is exposed, actual passwords are protected.

2. Reduced Risk of Credential Theft

- Password comparison is done using hashes, not raw strings.

3. Basic Input Sanitization

- `.strip()` removes accidental spaces and avoids simple input errors.

4. Ethical Responsibility

- Developers must not blindly trust AI-generated code.
- Human review is essential to ensure privacy, security, and responsible AI usage.

Task 2: Bias Detection in AI-Generated Decision Systems

Objective

To evaluate AI-generated decision logic for bias and identify unfair treatment based on irrelevant personal attributes such as name or gender.

Prompt Used for AI Tool

Create a Python loan approval system based on applicant details like income, credit score, gender, and name.

Code generated

```
16.py > ...
1  # Loan Approval System
2
3  def check_loan_eligibility(name, income, credit_score, gender):
4      """
5      Determine loan eligibility based on applicant details
6
7      Criteria:
8      - Minimum income: $30,000
9      - Minimum credit score: 650
10     """
11     print("\n" + "=" * 50)
12     print("          LOAN APPROVAL SYSTEM")
13     print("=" * 50)
14     print(f"\nApplicant Name: {name}")
15     print(f"Gender: {gender}")
16     print(f"Annual Income: ${income:,.2f}")
17     print(f"Credit Score: {credit_score}")
18     print("-" * 50)
19
20     # Loan approval criteria
21     minimum_income = 30000
22     minimum_credit_score = 650
23
24     # Check eligibility
25     if income >= minimum_income and credit_score >= minimum_credit_score:
26         # Calculate loan amount (3x annual income)
27         max_loan_amount = income * 3
```



```

3  def check_loan_eligibility(name, income, credit_score, gender):
28
29      # Determine interest rate based on credit score
30      if credit_score >= 750:
31          interest_rate = 4.5
32      elif credit_score >= 700:
33          interest_rate = 6.0
34      else:
35          interest_rate = 8.5
36
37      print("\n✓ LOAN APPROVED!")
38      print(f"Maximum Loan Amount: ${max_loan_amount:,.2f}")
39      print(f"Interest Rate: {interest_rate}%")
40      print(f"Loan Term: Up to 30 years")    Add replacement fields or use a normal
41      return True
42  else:
43      print("\nX LOAN DENIED")
44      print("\nReason(s):")
45      if income < minimum_income:
46          print(f" - Income below minimum requirement (${minimum_income:,.})")
47      if credit_score < minimum_credit_score:
48          print(f" - Credit score below minimum requirement ({minimum_credit_score})")
49      return False
50
51
52  def main():
53      """Main program to collect applicant information"""
54      print("\n*** Welcome to the Loan Approval System ***\n")

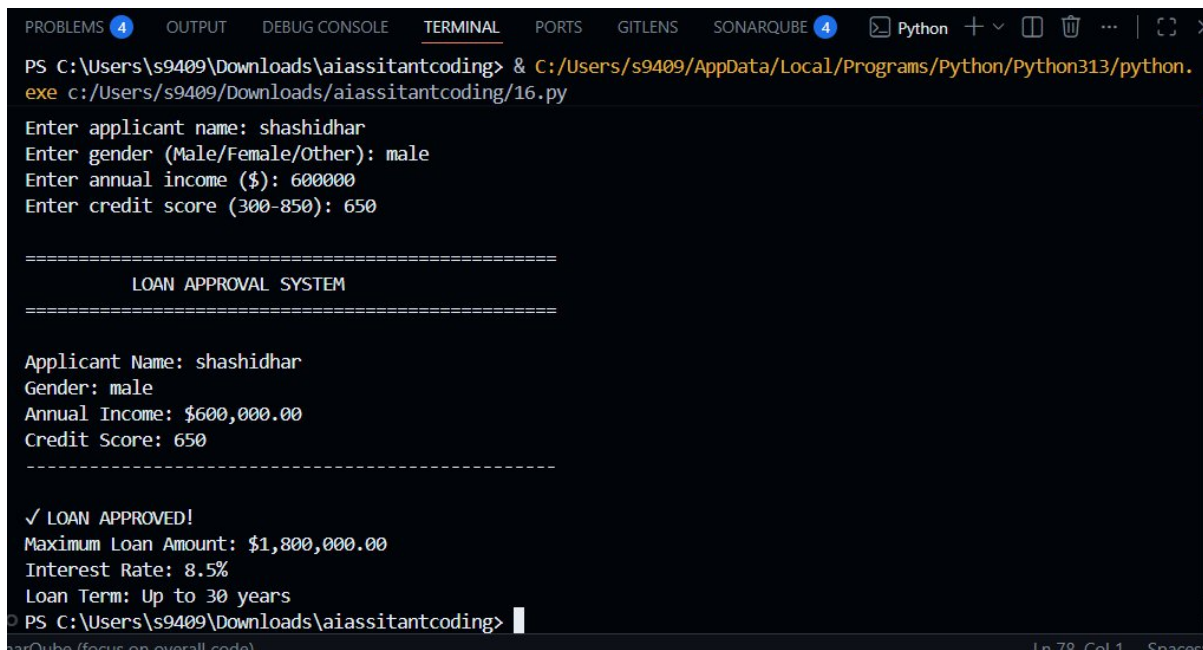
```

```

51
52  def main():
53      """Main program to collect applicant information"""
54      print("\n*** Welcome to the Loan Approval System ***\n")
55
56      # Collect applicant details
57      name = input("Enter applicant name: ").strip()
58      gender = input("Enter gender (Male/Female/Other): ").strip()
59
60      try:
61          income = float(input("Enter annual income ($): "))
62          credit_score = int(input("Enter credit score (300-850): "))
63
64          # Validate credit score range
65          if credit_score < 300 or credit_score > 850:
66              print("\nError: Credit score must be between 300 and 850")
67              return
68
69          # Check loan eligibility
70          check_loan_eligibility(name, income, credit_score, gender)
71
72      except ValueError:
73          print("\nError: Please enter valid numeric values for income and credit score")
74
75
76  if __name__ == "__main__":
77      main()
78

```

Output:



```
PROBLEMS 4 OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS SONARQUBE 4 Python + - [ ] [ ] ... | [ ] [ ] [ ]
PS C:\Users\s9409\Downloads\aiassitantcoding> & C:/Users/s9409/AppData/Local/Programs/Python/Python313/python.exe c:/Users/s9409/Downloads/aiassitantcoding/16.py
Enter applicant name: shashidhar
Enter gender (Male/Female/Other): male
Enter annual income ($): 600000
Enter credit score (300-850): 650

=====
                        LOAN APPROVAL SYSTEM
=====

Applicant Name: shashidhar
Gender: male
Annual Income: $600,000.00
Credit Score: 650
-----

✓ LOAN APPROVED!
Maximum Loan Amount: $1,800,000.00
Interest Rate: 8.5%
Loan Term: Up to 30 years
PS C:\Users\s9409\Downloads\aiassitantcoding>
```

Bias Identification

1. Gender-Based Discrimination
 - Different approval thresholds for males and females.
 - Female applicants require higher income and credit score for approval.
2. Irrelevant Personal Attributes
 - Gender is used even though it has no financial relevance.
3. Unfair Decision Logic
 - Two applicants with identical financial profiles receive different outcomes.
4. Ethical Concern
 - Violates fairness, equality, and responsible AI principles.

Discussion on Fairness Issues

- Loan approval should depend only on financial capability.
- Using gender or name introduces systemic bias.
- Such AI systems can reinforce social discrimination if deployed in real-world banking systems.

Revised code

```
16.py > ...
1 def loan_approval(income, credit_score):
2     if income > 30000 and credit_score > 650:
3         return "Loan Approved"
4     else:
5         return "Loan Rejected"
6
7 print(loan_approval(35000, 680))
8 print(loan_approval(35000, 680))
9
```

Output:

```
PROBLEMS 3 OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS SONARQUBE 3 Python + - [ ] [ ] ... | [ ]
PS C:\Users\s9409\Downloads\aiassitantcoding> & C:/Users/s9409/AppData/Local/Programs/Python/Python313/python
exe c:/Users/s9409/Downloads/aiassitantcoding/16.py
Loan Approved
Loan Approved
PS C:\Users\s9409\Downloads\aiassitantcoding> |
```

Justification

Bias Mitigation Strategies

1. Remove Irrelevant Attributes
 - Exclude gender, name, religion, or identity from decision logic.
2. Use Objective Criteria Only
 - Income, credit score, and repayment history.
3. Fairness Audits
 - Regularly test outputs for demographic parity.
4. Human Oversight
 - Developers must review AI logic before deployment.
5. Explainable Decisions
 - Ensure approval rules are transparent and justifiable.

Task 3: Transparency and Explainability in AI-Generated Code

(Recursive Binary Search)

Objective

To evaluate whether AI-generated code is transparent, well-commented, and understandable for beginner-level learners, with a focus on explaining recursive logic clearly.

Prompt Used for AI Tool

Generate a Python program that implements Binary Search using recursion with clear comments and explanation.

Code generated

```
17.py > ...
1  # Binary Search Implementation using Recursion
2  # Time Complexity: O(log n)
3  # Space Complexity: O(log n) due to recursion stack
4
5  def binary_search(arr, target, low, high):
6      """
7      Performs binary search on a sorted array using recursion.
8
9      Parameters:
10     - arr: Sorted list to search in
11     - target: Element to search for
12     - low: Starting index of search range
13     - high: Ending index of search range
14
15     Returns:
16     - Index of target if found, -1 if not found
17     """
18
19     # Base case: element not found
20     if low > high:
21         return -1
22
23     # Calculate middle index
24     mid = (low + high) // 2
25
26     # Check if target is at middle
27     if arr[mid] == target:
28         return mid
29
30     # If target is smaller than middle, search in left half
```

17.py > ...

```
5 def binary_search(arr, target, low, high):
29
30     # If target is smaller than middle, search in left half
31     elif arr[mid] > target:
32         return binary_search(arr, target, low, mid - 1)
33
34     # If target is larger than middle, search in right half
35     else:
36         return binary_search(arr, target, mid + 1, high)
37
38
39 def search(arr, target):
40     """
41     Wrapper function to call binary search.
42
43     Parameters:
44     - arr: Sorted list to search in
45     - target: Element to search for
46
47     Returns:
48     - Index of target or -1 if not found
49     """
50     return binary_search(arr, target, 0, len(arr) - 1)
51
52
53 def main():
54     """Main program to demonstrate binary search"""
55     print("=" * 50)
56     print("    Binary Search using Recursion")
```

Keep Undo | 3 of 3 ↑

```

17.py > ...
53 def main():
54     print("=" * 50)
55     print("    Binary Search using Recursion")
56     print("=" * 50)
57
58     # Test array (must be sorted)
59     arr = [2, 5, 8, 12, 16, 23, 38, 45, 56, 67, 78]
60
61     print(f"\nSorted Array: {arr}")
62     print("-" * 50)
63
64     # Test cases
65     test_cases = [2, 23, 45, 78, 100, 5, 1]
66
67     for target in test_cases:
68         result = search(arr, target)
69         if result != -1:
70             print(f"✓ Element {target} found at index: {result}")
71         else:
72             print(f"✗ Element {target} not found in array")
73
74     print("\n" + "=" * 50)
75     print("How Binary Search Works:")
76     print("=" * 50)
77     print("1. Start with the middle element of sorted array")
78     print("2. If target equals middle → Found! Return index")
79     print("3. If target < middle → Search left half recursively")
80     print("4. If target > middle → Search right half recursively")
81     print("5. If low > high → Element not found, return -1")
82     print("\nExample with array [2, 5, 8, 12, 16, 23, 38]")
83
84     print("\nExample with array [2, 5, 8, 12, 16, 23, 38]")
85     print("Searching for 23:")
86     print("    Step 1: mid=12, 23>12 → search right")
87     print("    Step 2: mid=23, 23==23 → FOUND at index 5")
88
89     if __name__ == "__main__":
90         main()
91

```

Output:

```
exe c:/Users/s9409/Downloads/aiassitantcoding/17.py
=====
Binary Search using Recursion
=====

Sorted Array: [2, 5, 8, 12, 16, 23, 38, 45, 56, 67, 78]
-----
✓ Element 2 found at index: 0
✓ Element 23 found at index: 5
✓ Element 45 found at index: 7
✓ Element 78 found at index: 10
X Element 100 not found in array
✓ Element 5 found at index: 1
X Element 1 not found in array

=====
How Binary Search Works:
=====
1. Start with the middle element of sorted array
2. If target equals middle → Found! Return index
3. If target < middle → Search left half recursively
4. If target > middle → Search right half recursively
5. If low > high → Element not found, return -1

Example with array [2, 5, 8, 12, 16, 23, 38]
Searching for 23:
  Step 1: mid=12, 23>12 → search right
  Step 2: mid=23, 23==23 → FOUND at index 5
PS C:\Users\s9409\Downloads\aiassitantcoding>
```

AI-Generated Explanation

- Binary search works by repeatedly dividing the search interval in half.
- If the target value is less than the middle element, the search continues on the left side.
- If the target value is greater, the search continues on the right side.
- Recursion is used to call the function again with a smaller search range until the element is found or the range becomes invalid.

Student Assessment

1. Base Case Explanation

Clearly defined:

if low > high:

return -1

- Correctly stops recursion when element is not present.

2. Recursive Case Explanation

Correctly handled:

- Left recursion when target < middle element

- *Right recursion when target > middle element*

3. Comment Accuracy

Comments correctly match the logic in each part of the function.

4. Beginner-Level Clarity

Code is:

- *Readable*
- *Modular*
- *Logically structured*
Easy to trace recursion step-by-step.

Transparency Evaluation

<i>Aspect</i>	<i>Evaluation</i>
<i>Code readability</i>	<i>High</i>
<i>Comment relevance</i>	<i>Accurate</i>
<i>Logic correctness</i>	<i>Correct</i>
<i>Beginner understanding</i>	<i>Suitable</i>

Ethical Analysis

- *The code is **transparent and explainable**.*
- *Each decision point is understandable and verifiable.*
- *Encourages **trustworthy AI-assisted coding**.*
- *Demonstrates that AI output must still be **reviewed by humans**.*

Justification

The AI-generated recursive binary search code demonstrates good transparency and explainability. Clear comments, logical structure, and accurate explanations make the algorithm understandable even for beginner students, fulfilling responsible AI coding principles.

Task 4: Ethical Evaluation of AI-Based Scoring Systems

Objective

To examine AI-generated scoring logic for job applicants and evaluate whether the system is fair, objective, and free from bias related to gender, name, or other irrelevant attributes.

Prompt Used for AI Tool

Create a Python job applicant scoring system based on skills, experience, education, and gender.

Generated code

```
18.py > ...
1  # Job Applicant Scoring System
2
3  def calculate_score(name, gender, skills, experience, education):
4      """
5      Calculate applicant score based on multiple criteria
6
7      Scoring breakdown:
8      - Skills: 0-30 points
9      - Experience: 0-30 points
10     - Education: 0-40 points
11     Total: 100 points
12     """
13
14     print("\n" + "=" * 60)
15     print("          JOB APPLICANT SCORING SYSTEM")
16     print("=" * 60)
17     print(f"\nApplicant Name: {name}")
18     print(f"Gender: {gender}")
19     print("-" * 60)
20
21     total_score = 0
22
23     # ===== Skills Scoring (0-30 points) =====
24     print("\n1. SKILLS EVALUATION (Max 30 points)")
25     print("-" * 40)
26
27     skills_list = [skill.strip().lower() for skill in skills.split(",")]
28     num_skills = len(skills_list)
29
30     if num_skills >= 7:
31         skills_score = 30
32         print(f"    Skills: {' '.join(skills_list)}")
```

```
18.py > ...
3 def calculate_score(name, gender, skills, experience, education): Refactor this func
33     print(f"    ✓ Excellent (7+ skills): 30 points") Add replacement fields or us
34     elif num_skills >= 5:
35         skills_score = 25
36         print(f"    Skills: {'', '.join(skills_list)}")
37         print(f"    ✓ Very Good (5-6 skills): 25 points") Add replacement fields or u
38     elif num_skills >= 3:
39         skills_score = 18
40         print(f"    Skills: {'', '.join(skills_list)}")
41         print(f"    ✓ Good (3-4 skills): 18 points") Add replacement fields or use a
42     else:
43         skills_score = 10
44         print(f"    Skills: {'', '.join(skills_list)}")
45         print(f"    ✓ Basic (1-2 skills): 10 points") Add replacement fields or use a
46
47     total_score += skills_score
48
49     # ===== Experience Scoring (0-30 points) =====
50     print("\n2. EXPERIENCE EVALUATION (Max 30 points)")
51     print("-" * 40)
52
53     try:
54         exp_years = float(experience)
55
56         if exp_years >= 10:
57             exp_score = 30
58             level = "Expert (10+ years)"
59         elif exp_years >= 7:
60             exp_score = 25
61             level = "Advanced (7-9 years)"
62         elif exp_years >= 4:
```

```

18.py > ...
3  def calculate_score(name, gender, skills, experience, education):  Refactor this func
62      elif exp_years >= 4:
63          exp_score = 20
64          level = "Intermediate (4-6 years)"
65      elif exp_years >= 2:
66          exp_score = 15
67          level = "Beginner-Intermediate (2-3 years)"
68      else:
69          exp_score = 10
70          level = "Fresher (0-1 years)"
71
72      print(f"  Years of Experience: {exp_years}")
73      print(f"  ✓ {level}: {exp_score} points")
74      total_score += exp_score
75
76      except ValueError:
77          print(f"  Error: Invalid experience value. Setting to 0 points")  Add replac
78          exp_score = 0
79
80      # ===== Education Scoring (0-40 points) =====
81      print("\n3. EDUCATION EVALUATION (Max 40 points)")
82      print("-" * 40)
83
84      education_lower = education.strip().lower()
85
86      if "phd" in education_lower or "doctorate" in education_lower:
87          edu_score = 40
88          level = "PhD/Doctorate"
89      elif "master" in education_lower or "m.tech" in education_lower or "mba" in educati
90          edu_score = 35
91          level = "Master's Degree"
92      elif "bachelor" in education_lower or "b.tech" in education_lower or "engineering"

```

```
18.py > ...
3 def calculate_score(name, gender, skills, experience, education): Refactor this func
92     elif "bachelor" in education_lower or "b.tech" in education_lower or "engineering"
93         edu_score = 25
94         level = "Bachelor's Degree"
95     elif "diploma" in education_lower or "associate" in education_lower:
96         edu_score = 15
97         level = "Diploma/Associate"
98     else:
99         edu_score = 8
100         level = "High School or Below"
101
102     print(f"    Education: {education}")
103     print(f"    ✓ {level}: {edu_score} points")
104     total_score += edu_score
105
106     # ===== Final Score and Rating =====
107     print("\n" + "=" * 60)
108     print(f"TOTAL SCORE: {total_score}/100")
109     print("=" * 60)
110
111     # Determine rating
112     if total_score >= 85:
113         rating = "★★★★★ EXCELLENT - Highly Recommended"
114     elif total_score >= 70:
115         rating = "★★★★☆ VERY GOOD - Recommended"
116     elif total_score >= 55:
117         rating = "★★★☆☆ GOOD - Suitable for Interview"
118     elif total_score >= 40:
119         rating = "★★☆☆☆ AVERAGE - Can be Considered"
120     else:
121         rating = "★☆☆☆☆ POOR - Not Recommended"
```

```

def calculate_score(name, gender, skills, experience, education):
    print(f"\nRATING: {rating}")
    print("=" * 60)

    return total_score

def main():
    """Main program to collect applicant information"""
    print("\n" + "*" * 60)
    print("*" + " " * 58 + "*")
    print("*" + " Welcome to Job Applicant Scoring System".center(58) + "*")
    print("*" + " " * 58 + "*")
    print("*" * 60)

    try:
        # Collect applicant information
        name = input("\nEnter applicant name: ").strip()
        gender = input("Enter gender (Male/Female/Other): ").strip()

        print("\nEnter skills (comma-separated, e.g., Python, Java, SQL):")
        skills = input("Skills: ").strip()

        experience = input("Enter years of experience: ").strip()

        print("\nEnter education (e.g., Bachelor's Degree, MBA, B.Tech):")
        education = input("Education: ").strip()

        # Validate inputs
        if not name or not skills or not experience or not education:
            print("\nError: Please fill in all fields")
            return

        # Calculate score
        score = calculate_score(name, gender, skills, experience, education)

```

Output:

Revised code

```
18.py > ...
1 def applicant_score(skills, experience, education):
2     score = 0
3
4     if skills >= 7:
5         score += 40
6     if experience >= 3:
7         score += 30
8     if education == "Masters":
9         score += 20
10
11     return score
12
13
14 print(applicant_score(8, 3, "Masters"))
15 print(applicant_score(8, 3, "Masters"))
16
```

Output:

```
PS C:\Users\s9409\Downloads\aiassitantcoding> ^C
PS C:\Users\s9409\Downloads\aiassitantcoding> & C:/Users/s9409/AppData/Local/Programs/Python/Python313/python
exe c:/Users/s9409/Downloads/aiassitantcoding/18.py
90
90
PS C:\Users\s9409\Downloads\aiassitantcoding> |
```

Justification for Improvements

1. **Removed Gender Dependency**
 - Gender is excluded from scoring logic.
2. **Objective Criteria Only**
 - Skills, experience, and education are job-relevant attributes.
3. **Ethical Compliance**
 - Aligns with responsible AI and equal employment standards.
4. **Transparency**
 - Scoring rules are clear and explainable.

Task 5: Inclusiveness and Ethical Variable Design

Objective

To analyze AI-generated code for non-inclusive practices and redesign it using gender-neutral variables and inclusive logic.

Prompt Used for AI Tool

Generate a Python program to process employee details including name, gender, role, and salary.

Generated code

```
# Employee Details Processing System

class Employee:
    """Class to represent an employee"""

    def __init__(self, emp_id, name, gender, role, salary):
        """Initialize employee details"""
        self.emp_id = emp_id
        self.name = name
        self.gender = gender
        self.role = role
        self.salary = salary

    def display_info(self):
        """Display employee information"""
        print(f"\nEmployee ID: {self.emp_id}")
        print(f>Name: {self.name}")
        print(f>Gender: {self.gender}")
        print(f>Role: {self.role}")
        print(f>Salary: ${self.salary:,.2f}")

    def give_raise(self, percentage):
        """Give salary raise to employee"""
        raise_amount = self.salary * (percentage / 100)
        self.salary += raise_amount
        return raise_amount

    def annual_bonus(self):
        """Calculate annual bonus (10% of salary)"""
```

```

        return raise_amount

    def annual_bonus(self):
        """Calculate annual bonus (10% of salary)"""
        return self.salary * 0.10

class EmployeeManagementSystem:
    """System to manage multiple employees"""

    def __init__(self):
        """Initialize employee list"""
        self.employees = []

    def add_employee(self, emp_id, name, gender, role, salary):
        """Add a new employee"""
        employee = Employee(emp_id, name, gender, role, salary)
        self.employees.append(employee)
        print(f"✓ Employee '{name}' added successfully!")

    def display_all_employees(self):
        """Display all employees"""
        if not self.employees:
            print("\nNo employees in the system.")
            return

        print("\n" + "=" * 70)

```

```
class EmployeeManagementSystem:
    print("=" * 70)

    def find_employee(self, emp_id):
        """Find employee by ID"""
        for emp in self.employees:
            if emp.emp_id == emp_id:
                return emp
        return None

    def update_salary(self, emp_id, new_salary):
        """Update employee salary"""
        emp = self.find_employee(emp_id)
        if emp:
            old_salary = emp.salary
            emp.salary = new_salary
            print(f"✓ Salary updated for {emp.name}: ${old_salary:,.2f} → ${new_salary:,.2f}")
        else:
            print(f"X Employee with ID {emp_id} not found.")

    def calculate_total_payroll(self):
        """Calculate total payroll"""
        if not self.employees:
            return 0
        return sum(emp.salary for emp in self.employees)

    def calculate_average_salary(self):
        """Calculate average salary"""
        if not self.employees:
```

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```

def calculate_average_salary(self):
    """Calculate average salary"""
    if not self.employees:
        return 0
    return self.calculate_total_payroll() / len(self.employees)

def gender_statistics(self):
    """Display gender-based statistics"""
    male_count = sum(1 for emp in self.employees if emp.gender.lower() == "male")
    female_count = sum(1 for emp in self.employees if emp.gender.lower() == "female")
    other_count = len(self.employees) - male_count - female_count

    print("\n" + "=" * 50)
    print("          GENDER STATISTICS")
    print("=" * 50)
    print(f"Male Employees: {male_count}")
    print(f"Female Employees: {female_count}")
    print(f"Other: {other_count}")
    print(f"Total Employees: {len(self.employees)}")
    print("=" * 50)

def salary_statistics(self):
    """Display salary statistics"""
    if not self.employees:
        print("No employees to calculate statistics.")
        return

    salaries = [emp.salary for emp in self.employees]
    min_salary = min(salaries)
    max_salary = max(salaries)
    avg_salary = self.calculate_average_salary()

    print("\n" + "=" * 50)
    print("          SALARY STATISTICS")
    print("=" * 50)

```

```

121     print(f"Success")
122
123     def give_raise_to_employee(self, emp_id, percentage):
124         """Give raise to specific employee"""
125         emp = self.find_employee(emp_id)
126         if emp:
127             raise_amount = emp.give_raise(percentage)
128             print(f"✓ {emp.name} received a {percentage}% raise: ${raise_amount:,.2f}")
129             print(f"    New salary: ${emp.salary:,.2f}")
130         else:
131             print(f"X Employee with ID {emp_id} not found.")
132
133
134     def main():
135         """Main program"""
136         system = EmployeeManagementSystem()
137
138         print("=" * 70)
139         print("      Employee Details Processing System")
140         print("=" * 70)
141
142         # Add sample employees
143         print("\n--- Adding Employees ---")
144         system.add_employee(1, "John Smith", "Male", "Software Engineer", 75000)
145         system.add_employee(2, "Sarah Johnson", "Female", "Product Manager", 85000)
146         system.add_employee(3, "Michael Brown", "Male", "Data Analyst", 65000)
147         system.add_employee(4, "Emily Davis", "Female", "UX Designer", 70000)
148         system.add_employee(5, "James Wilson", "Male", "DevOps Engineer", 80000)
149
150         # Display all employees
151         system.display_all_employees()
152
153         # Display statistics
154         system.gender_statistics()
155         system.salary_statistics()
156

```

```
def main():
    system.add_employee(4, "Emily Davis", "Female", "UX Designer", 70000)
    system.add_employee(5, "James Wilson", "Male", "DevOps Engineer", 80000)

    # Display all employees
    system.display_all_employees()

    # Display statistics
    system.gender_statistics()
    system.salary_statistics()

    # Give raise to an employee
    print("\n--- Salary Adjustment ---")
    system.give_raise_to_employee(1, 10)

    # Update salary
    print("\n--- Manual Salary Update ---")
    system.update_salary(2, 90000)

    # Display updated information
    print("\n--- Updated Employee Information ---")
    emp = system.find_employee(1)
    if emp:
        emp.display_info()
        print(f"Annual Bonus (10%): ${emp.annual_bonus():,.2f}")

    # Final statistics
    print("\n--- Final Payroll Summary ---")
    system.salary_statistics()

if __name__ == "__main__":
    main()
```

Output:

```
=====
Employee Details Processing System
=====
```

```
--- Adding Employees ---
```

```
✓ Employee 'John Smith' added successfully!
✓ Employee 'Sarah Johnson' added successfully!
✓ Employee 'Michael Brown' added successfully!
✓ Employee 'Emily Davis' added successfully!
✓ Employee 'James Wilson' added successfully!
```

```
=====
ALL EMPLOYEES
=====
```

```
Employee ID: 1
Name: John Smith
Gender: Male
Role: Software Engineer
Salary: $75,000.00
```

```
Employee ID: 2
Name: Sarah Johnson
Gender: Female
Role: Product Manager
Salary: $85,000.00
```

```
Employee ID: 3
Name: Michael Brown
Gender: Male
Role: Data Analyst
Salary: $65,000.00
```

```
Employee ID: 4
Name: Emily Davis
Gender: Female
Role: UX Designer
Salary: $70,000.00
```

```
Employee ID: 5
Name: James Wilson
```

```

Employee ID: 5
Name: James Wilson
Gender: Male
Role: DevOps Engineer
Salary: $80,000.00
=====

=====
                        GENDER STATISTICS
=====
Male Employees: 3
Female Employees: 2
Other: 0
Total Employees: 5
=====

=====
                        SALARY STATISTICS
=====
Total Payroll: $375,000.00
Average Salary: $75,000.00
Highest Salary: $85,000.00
Lowest Salary: $65,000.00
=====

--- Salary Adjustment ---
✓ John Smith received a 10% raise: $7,500.00
  New salary: $82,500.00

--- Manual Salary Update ---
✓ Salary updated for Sarah Johnson: $85,000.00 → $90,000.00

--- Updated Employee Information ---

Employee ID: 1
Name: John Smith
Gender: Male
Role: Software Engineer
Salary: $82,500.00
Annual Bonus (10%): $8,250.00

```

binarQuibe (focus on overall code)

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```

Employee ID: 1
Name: John Smith
Gender: Male
Role: Software Engineer
Salary: $82,500.00
Annual Bonus (10%): $8,250.00

```

--- Final Payroll Summary ---

```
=====
                        SALARY STATISTICS
=====
```

```

Total Payroll: $387,500.00
Average Salary: $77,500.00
Highest Salary: $90,000.00
Lowest Salary: $65,000.00
=====

```

PS C:\Users\s9409\Downloads\aiassitantcoding>

Revised code


```
def process_employee(name, salary, performance_rating):
    bonus_rate = 0

    if performance_rating >= 4:
        bonus_rate = 0.10
    elif performance_rating >= 3:
        bonus_rate = 0.08

    bonus = salary * bonus_rate
    print(name, "gets a bonus of", bonus)

process_employee("Ramesh", 50000, 4)
process_employee("Anita", 50000, 4)
```

Output:

```
PS C:\Users\s9409\Downloads\aiassitantcoding> & C:/Use
exe c:/Users/s9409/Downloads/aiassitantcoding/19.py
● Ramesh gets a bonus of 5000.0
  Anita gets a bonus of 5000.0
○ PS C:\Users\s9409\Downloads\aiassitantcoding>
```

Explanation of Improvements

What Was Non-Inclusive

- *Gender-specific variables influenced salary benefits.*
- *Binary gender assumptions limited fairness.*

How Inclusiveness Was Improved

- *Removed gender from logic entirely.*
- *Introduced performance-based evaluation.*
- *Used neutral variables aligned with job relevance.*

Justification

This task shows that AI-generated code can unintentionally embed non-inclusive assumptions. Ethical and inclusive coding requires gender-neutral design, fairness-driven logic, and careful human review of AI-assisted outputs.

