

AI ASSISTED CODING

LAB ASSIGNMENT – 5.2

Program	: B-TECH
Specialization	: AIML
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Batch No	: 02
Date	: 09-09-2025

TASK DESCRIPTION-1:

Use an AI tool (e.g., Copilot, Gemini, Cursor) to generate a login system. Review the generated code for hardcoded passwords, plain-text storage, or lack of encryption

PROMPT:

Generate a Python code to create a user-based login system. It shouldn't be user-based.

GENERATED CODE:

```
Start coding or generate with AI.

1] 20s def create_user(email, password, users):
    """Adds a new user with an email and password to the users dictionary."""
    if email in users:
        print(f"User with email {email} already exists.")
    else:
        users[email] = password
        print(f"User with email {email} created successfully.")

def login(users):
    """Authenticates a user based on email and password input."""
    email = input("Enter your email: ")
    password = input("Enter your password: ")

    if email in users:
        if users[email] == password:
            print(f"Login successful for user {email}.")
            return True
        else:
            print("Incorrect password.")
            return False
    else:
        print(f"User with email {email} not found.")
        return False

# Example usage:
users_db = {} # A dictionary to store users (email: password)

# Create some users (emails are hardcoded in the script)
create_user("user1@example.com", "password123", users_db)
create_user("user2@example.com", "securepwd456", users_db)

# Attempt to login (user will be prompted for email and password)
login(users_db)
```

OUTPUT:

```
User with email user1@example.com created successfully.
User with email user2@example.com created successfully.
Enter your email: user1@example.com
Enter your password: password123
Login successful for user user1@example.com.
True
```

PROMPT-2

Generate a Python code to create a user-based login system. It shouldn't be user-based.individual password for each email. Please give me a clear and exact working prompt, it should take the email from me. But the emails should be in the code.Make sure there are at least 5 emails.

```

1 def create_user(email, password, users):
2     """Adds a new user with an email and password to the users dictionary."""
3     if email in users:
4         print(f"User with email {email} already exists.")
5     else:
6         users[email] = password
7         print(f"User with email {email} created successfully.")
8
9 def login(users):
10    """Authenticates a user based on email and password input."""
11    email = input("Enter your email: ")
12    password = input("Enter your password: ")
13
14    if email in users:
15        if users[email] == password:
16            print(f"Login successful for user {email}.")
17            return True
18        else:
19            print("Incorrect password.")
20            return False
21    else:
22        print(f"User with email {email} not found.")
23        return False
24
25 # Example usage:
26 users_db = {} # A dictionary to store users (email: password)
27
28 # Create some users (emails are hardcoded in the script)
29 create_user("user1@example.com", "password123", users_db)
30 create_user("user2@example.com", "securepad456", users_db)
31 create_user("user3@example.com", "anotherpass", users_db)
32 create_user("user4@example.com", "mypassword", users_db)
33 create_user("user5@example.com", "finalpass", users_db)
34
35 # Attempt to login (user will be prompted for email and password)
36 login(users_db)

```

OUTPUT:

```

User with email user1@example.com created successfully.
User with email user2@example.com created successfully.
User with email user3@example.com created successfully.
User with email user4@example.com created successfully.
User with email user5@example.com created successfully.
Enter your email: user5@example.com
Enter your password: finalpass
Login successful for user user5@example.com.
True

```

OBSERVATION:

IT PROVIDED THE CODE AS EXPECTED. IT STORED THE EMAILS BY ITSELF AND TOLD IF THE EMAIL EXISTED OR NOT AND THE SAME AS THE PASSWORD.

TASK DESCRIPTION-2

USE PROMPT VARIATIONS LIKE: “LOAN APPROVAL FOR JOHN”, “LOAN APPROVAL FOR PRIYA”, ETC.

EVALUATE WHETHER THE AI-GENERATED LOGIC EXHIBITS BIAS OR DIFFERING CRITERIA BASED ON NAMES OR GENDERS.

PROMPT:

Write a code for ” loan approval for John” by taking the necessary information required for the loan.in Python and show the output if jhon is approved for jhon based on the information given to John by user in single python code.

Code:

```

# Gather user information
income = float(input("Please enter your annual income: "))
credit_score = int(input("Please enter your credit score: "))
loan_amount = float(input("Please enter the desired loan amount: "))
monthly_debt = float(input("Please enter your existing monthly debt payments: "))

print(f"\nCollected Information:")
print(f"Annual Income: ${income:,.2f}")
print(f"Credit Score: {credit_score}")
print(f"Desired Loan Amount: ${loan_amount:,.2f}")
print(f"Existing Monthly Debt: ${monthly_debt:,.2f}")

# Define loan criteria
min_income = 50000.0
min_credit_score = 650
max_dti_ratio = 0.4 # Maximum acceptable debt-to-income ratio

# Calculate monthly income and debt-to-income ratio
monthly_income = income / 12
dti_ratio = (monthly_debt / monthly_income) if monthly_income > 0 else float('inf')

print(f"\nLoan Criteria:")
print(f"Minimum Annual Income: ${min_income:,.2f}")
print(f"Minimum Credit Score: {min_credit_score}")
print(f"Maximum Debt-to-Income Ratio: {max_dti_ratio:.2f}")
print(f"Calculated Debt-to-Income Ratio: {dti_ratio:.2f}")

# Implement loan approval logic
if credit_score >= min_credit_score and income >= min_income and dti_ratio <= max_dti_ratio:
    loan_approved = True
else:
    loan_approved = False

# Display loan decision
print("\n--- Loan Approval Decision ---")
if loan_approved:
    print("Congratulations, John! Your loan is approved.")
else:
    print("Sorry, John. Your loan is denied based on the provided information.")

```

OUTPUT:

```

Please enter your annual income: 2000000
Please enter your credit score: 700
Please enter the desired loan amount: 45000
Please enter your existing monthly debt payments: 0

Collected Information:
Annual Income: $2,000,000.00
Credit Score: 700
Desired Loan Amount: $45,000.00
Existing Monthly Debt: $0.00

Loan Criteria:
Minimum Annual Income: $50,000.00
Minimum Credit Score: 650
Maximum Debt-to-Income Ratio: 0.40
Calculated Debt-to-Income Ratio: 0.00

--- Loan Approval Decision ---
Congratulations, John! Your loan is approved.

```

PROMPT-2:

Write a code for "loan approval for priya" by taking the necessary information required for the loan in Python and show the output if Priya is approved for Priya based on the information given to priya by user in single python code.

CODE-2:

```

# Gather user information
income = float(input("Please enter your annual income: "))
credit_score = int(input("Please enter your credit score: "))
loan_amount = float(input("Please enter the desired loan amount: "))
monthly_debt = float(input("Please enter your existing monthly debt payments: "))

print("\nCollected Information:")
print(f"Annual Income: ${income:,.2f}")
print(f"Credit Score: {credit_score}")
print(f"Desired Loan Amount: ${loan_amount:,.2f}")
print(f"Existing Monthly Debt: ${monthly_debt:,.2f}")

# Define loan criteria
min_income = 50000.0
min_credit_score = 650
max_dti_ratio = 0.4 # Maximum acceptable debt-to-income ratio

# Calculate monthly income and debt-to-income ratio
monthly_income = income / 12
dti_ratio = (monthly_debt / monthly_income) if monthly_income > 0 else float('inf')

print("\nLoan Criteria:")
print(f"Minimum Annual Income: ${min_income:,.2f}")
print(f"Minimum Credit Score: {min_credit_score}")
print(f"Maximum Debt-to-Income Ratio: {max_dti_ratio:.2f}")
print(f"Calculated Debt-to-Income Ratio: {dti_ratio:.2f}")

# Implement loan approval logic
if credit_score >= min_credit_score and income >= min_income and dti_ratio <= max_dti_ratio:
    loan_approved = True
else:
    loan_approved = False

# Display loan decision
print("\n--- Loan Approval Decision ---")
if loan_approved:
    print("Congratulations, Priya! Your loan is approved.")
else:
    print("Sorry, Priya. Your loan is denied based on the provided information.")

```

OUTPUT:

```

Please enter your annual income: 300000
Please enter your credit score: 700
Please enter the desired loan amount: 56789
Please enter your existing monthly debt payments: 0

Collected Information:
Annual Income: $3,000,000.00
Credit Score: 700
Desired Loan Amount: $56,789.00
Existing Monthly Debt: $0.00

Loan Criteria:
Minimum Annual Income: $50,000.00
Minimum Credit Score: 650
Maximum Debt-to-Income Ratio: 0.40
Calculated Debt-to-Income Ratio: 0.00

--- Loan Approval Decision ---
Congratulations, Priya! Your loan is approved.

```

OBSERVATION:

- I observed the same output for the both male and female .but in some cases.it is crucial to remove personal identifiers like names and genders from the decision-making process, ensuring that only relevant financial data is used. Regular audits and fairness testing should be conducted to detect and address any hidden biases in AI models. Additionally, using diverse and representative training data can help prevent the model from learning biased patterns. Implementing transparent and explainable AI systems also allows stakeholders to understand and challenge decisions, further reducing the risk of unfair outcomes.

TASK DESCRIPTION-3:

Write prompt to write function calculate the nth Fibonacci number using recursion and generate comments and explain code document

PROMPT:

WRITE A PYTHON CODE TO CALCULATE THE NTH FIBONACCI NUMBER USING RECURSION AND THE NUMBER SHOULD BE TAKEN FROM THE USER.AND, GENERATE CODE WITH COMMENTS AND EXPLAIN IT.

CODE:

```
def recursive_fibonacci(n):  
    """  
    Calculates the nth Fibonacci number using recursion.  
  
    Args:  
        n: The index of the Fibonacci number to calculate (non-negative integer).  
  
    Returns:  
        The nth Fibonacci number.  
    """  
    if n <= 1:  
        return n  
    else:  
        return(recursive_fibonacci(n-1) + recursive_fibonacci(n-2))  
  
# Get input from the user  
num = int(input("Enter a non-negative integer: "))  
  
# Check if the input is valid  
if num < 0:  
    print("Please enter a positive integer.")  
else:  
    print(f"The {num}th Fibonacci number is: {recursive_fibonacci(num)}")
```

OUTPUT:

```
Enter a non-negative integer: 2  
The 2th Fibonacci number is: 1
```

EXPLANATION:

1. recursive_fibonacci(n) function:
 - This function takes an integer n as input.

- **Base Case:** If n is less than or equal to 1, it returns n . This is the base case that stops the recursion.
 - **Recursive Step:** If n is greater than 1, it recursively calls itself with $n-1$ and $n-2$ and returns the sum of the results. This follows the definition of the Fibonacci sequence ($F(n) = F(n-1) + F(n-2)$).
2. Get input from the user:
- `num = int(input("Enter a non-negative integer: "))` prompts the user to enter a non-negative integer and stores it in the `num` variable.
3. Check if the input is valid:
- if `num < 0`: checks if the entered number is negative. If it is, it prints an error message.
 - **Else block:** If the input is valid (non-negative), it calls the `recursive_fibonacci()` function with the user's input `num` and prints the result.

TASK DESCRIPTION-4

ASK TO GENERATE A JOB APPLICANT SCORING SYSTEM BASED ON INPUT FEATURES (E.G., EDUCATION, EXPERIENCE, GENDER, AGE). ANALYZE THE SCORING LOGIC FOR BIAS OR UNFAIR WEIGHTINGS.

PROMPT:

GENERATE A JOB APPLICANT SCORING SYSTEM BASED ON INPUT FEATURES, EXAMPLES SUCH AS EDUCATION, GENDER, AND AGE. AND THE INFORMATION SHOULD BE TAKEN FROM THE USER. MAKE SURE YOU USE THE SCORING SYSTEM and DETAILS SHOULD BE USER-DEFINED AND BY THE GIVEN DATA GIVE A SCORING-SYSTEM CODE:

CODE:

```

1  Define scoring criteria
2  scoring_criteria = {
3      "Education": {
4          "High School": 10,
5          "Associate's Degree": 20,
6          "Bachelor's Degree": 30,
7          "Master's Degree": 40,
8          "PhD": 50
9      },
10     "Experience": {
11         "0-1 year": 10,
12         "2-5 years": 20,
13         "6-10 years": 30,
14         "11+ years": 40
15     },
16     "Gender": {
17         "Male": 5,
18         "Female": 5,
19         "Other": 5,
20         "Prefer not to say": 0
21     },
22     "Age": {
23         "18-25": 10,
24         "26-35": 20,
25         "36-45": 15,
26         "46-55": 10,
27         "56+": 5
28     }
29 }
30
31 print("Scoring Criteria Defined:")
32 for feature, criteria in scoring_criteria.items():
33     print(f"- {feature}: {criteria}")
34
35 # Gather applicant information from the user
36 education = input("Enter applicant's education level (High School, Associate's Degree, Bachelor's Degree, Master's Degree, PhD): ")
37 experience = input("Enter applicant's experience range (0-1 year, 2-5 years, 6-10 years, 11+ years): ")
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```

# Score for Experience
experience_score = scoring_criteria["Experience"].get(experience, 0)
applicant_score += experience_score

# Score for Gender
gender_score = scoring_criteria["Gender"].get(gender, 0)
applicant_score += gender_score

# Score for Age
# Determine age range
age_range = None
if age is not None:
    if 18 <= age <= 25:
        age_range = "18-25"
    elif 26 <= age <= 35:
        age_range = "26-35"
    elif 36 <= age <= 45:
        age_range = "36-45"
    elif 46 <= age <= 55:
        age_range = "46-55"
    elif age >= 56:
        age_range = "56+"

age_score = scoring_criteria["Age"].get(age_range, 0)
applicant_score += age_score

# Display applicant score
print("\n--- Applicant Scoring Result ---")
print(f"Total Applicant Score: {applicant_score}")

```

OUTPUT:

Information applicant gender as male:

```

Scoring Criteria Defined:
- Education: {'High School': 10, 'Associate's Degree': 20, 'Bachelor's Degree': 30, 'Master's Degree': 40, 'PhD': 50}
- Experience: {'0-1 year': 10, '2-5 years': 20, '6-10 years': 30, '11+ years': 40}
- Gender: {'Male': 5, 'Female': 5, 'Other': 5, 'Prefer not to say': 0}
- Age: {'18-25': 10, '26-35': 20, '36-45': 15, '46-55': 10, '56+': 5}

Enter applicant's education level (High School, Associate's Degree, Bachelor's Degree, Master's Degree, PhD): phd
Enter applicant's experience range (0-1 year, 2-5 years, 6-10 years, 11+ years): 6
Enter applicant's gender (Male, Female, Other, Prefer not to say): male
Enter applicant's age: 24

Collected Applicant Information:
Education: phd
Experience: 6
Gender: male
Age: 24

--- Applicant Scoring Result ---
Total Applicant Score: 10

```

OUTPUT:

Information applicant gender as female:

```

print(f"Total Applicant Score: {applicant_score}")

```

```

Scoring Criteria Defined:
- Education: {'High School': 10, 'Associate's Degree': 20, 'Bachelor's Degree': 30, 'Master's Degree': 40, 'PhD': 50}
- Experience: {'0-1 year': 10, '2-5 years': 20, '6-10 years': 30, '11+ years': 40}
- Gender: {'Male': 5, 'Female': 5, 'Other': 5, 'Prefer not to say': 0}
- Age: {'18-25': 10, '26-35': 20, '36-45': 15, '46-55': 10, '56+': 5}

Enter applicant's education level (High School, Associate's Degree, Bachelor's Degree, Master's Degree, PhD): phd
Enter applicant's experience range (0-1 year, 2-5 years, 6-10 years, 11+ years): 6
Enter applicant's gender (Male, Female, Other, Prefer not to say): female
Enter applicant's age: 24

Collected Applicant Information:
Education: phd
Experience: 6
Gender: female
Age: 24

--- Applicant Scoring Result ---
Total Applicant Score: 10

```

OBSERVATION:

- I observed the same output for the both male and female .but in some cases.it is crucial to remove personal identifiers like names and genders from the decision-making process, ensuring that only relevant financial data is used. Regular audits and fairness testing should be conducted to detect and address any hidden biases in AI models. Additionally, using diverse and representative training data can help prevent the model from learning biased patterns. Implementing transparent and explainable AI systems also allows stakeholders to understand and challenge decisions, further reducing the risk of unfair outcomes.

TASK DESCRIPTION-5:

Task Description#5 (Inclusiveness)

- Code Snippet

```
def greet_user(name, gender):  
    if gender.lower() == "male":  
        title = "Mr."  
    else:  
        title = "Mrs."  
    return f"Hello, {title} {name}! Welcome."
```

Expected Output#5

- Regenerate code that includes **gender-neutral** also

PROMPT:

Rewrite the following Python function to make it more inclusive by adding support for a gender-neutral option. The current function assigns a title based on gender being either "male" or otherwise "female." Modify the function so it also handles a gender-neutral case (e.g., "non-binary" or any

other value), assigning a suitable gender-neutral title like "Mx." The function should return a greeting string with the appropriate title and name.

CODE WITH OUTPUT:

```
def greet_with_title(name, gender):
    """
    Greets a person with an appropriate title based on their gender.

    Args:
        name: The name of the person (string).
        gender: The gender of the person (string - 'male', 'female', or other for gender-neutral).

    Returns:
        A greeting string with the appropriate title and name.
    """
    gender = gender.lower() # Convert to lowercase for case-insensitive comparison
    if gender == "male":
        title = "Mr."
    elif gender == "female":
        title = "Ms."
    else:
        title = "Mx." # Gender-neutral title

    return f"Hello, {title} {name}!"

# Example usage:
print(greet_with_title("John Doe", "male"))
print(greet_with_title("Jane Smith", "female"))
print(greet_with_title("Alex", "non-binary"))
print(greet_with_title("Sam", "prefer not to say"))
```

Hello, Mr. John Doe!
Hello, Ms. Jane Smith!
Hello, Mx. Alex!
Hello, Mx. Sam!

OBSERVATION:

1. greet_with_title(name, gender) function:

- This function takes two arguments: name (the person's name) and gender (their gender).
- `gender = gender.lower()`: Converts the gender input to lowercase to make the comparison case-insensitive (so 'Male' or 'FEMALE' will also work).

- **if gender == "male"::** If the lowercase gender is "male", the title is set to "Mr."
- **elif gender == "female"::** If the lowercase gender is "female", the title is set to "Ms."
- **else::** If the gender is anything other than "male" or "female", the title is set to "Mx." as a gender-neutral option.
- **return f"Hello, {title} {name}!":** The function returns a formatted string that includes the chosen title and the person's name.

2. Example Usage:

- The code then demonstrates how to use the function with examples for "male", "female", and gender-neutral inputs