

SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		DEPARTMENT OF COMPUTER SCIENCE ENGINEERING	
Program Name: B. Tech	Assignment Type: Lab	Academic Year: 2025-2026	
Course Coordinator Name	Dr. Rishabh Mittal		
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Course Code	23CS002PC304	Course Title	AI Assisted Coding
Year/Sem	III/II	Regulation	R23
Date and Day of Assignment	Week3 – Wednesday	Time(s)	23CSBTB01 To 23CSBTB52
Duration	2 Hours	Applicable to Batches	All batches
AssignmentNumber: 6.3 (Present assignment number)/24 (Total number of assignments)			

Q.No.	Question	Expected Time to complete
1	<p>Lab 6: AI-Based Code Completion – Classes, Loops, and Conditionals</p> <p>Lab Objectives</p> <ul style="list-style-type: none"> • To explore AI-powered auto-completion features for core Python constructs such as classes, loops, and conditional statements. • To analyze how AI tools suggest logic for object-oriented programming and control structures. • To evaluate the correctness, readability, and completeness of AI-generated Python code. 	Week3 - Wednesday

	<p>Lab Outcomes (LOs)</p> <p>After completing this lab, students will be able to:</p> <ul style="list-style-type: none">• Use AI tools to generate and complete Python class definitions and methods.• Understand and assess AI-suggested loop constructs for iterative tasks.• Generate and evaluate conditional statements using AI-driven prompts.• Critically analyze AI-assisted code for correctness, clarity, and efficiency.	
	<p>Task Description #1: Classes (Student Class)</p> <p>Scenario You are developing a simple student information management module.</p> <p>Task</p> <ul style="list-style-type: none">• Use an AI tool (GitHub Copilot / Cursor AI / Gemini) to complete a Student class.• The class should include attributes such as name, roll number, and branch.• Add a method <code>display_details()</code> to print student information.• Execute the code and verify the output.• Analyze the code generated by the AI tool for correctness and clarity. <p>Expected Output #1</p> <ul style="list-style-type: none">• A Python class with a constructor (<code>__init__</code>) and a <code>display_details()</code> method.• Sample object creation and output displayed on the console.• Brief analysis of AI-generated code.	

The screenshot shows a terminal window with the following content:

```

JS resume devops.js  ↗ Tomato .html  ↗ lab 3 devops.html  ↗ DOM.html
C: > Users > shash > Downloads > counter-app > AAC A 6.3.py > ...
1  class Student:
2      def __init__(self, name, roll_number, branch):
3          self.name = name
4          self.roll_number = roll_number
5          self.branch = branch
6
7      def display_details(self):
8          print(f"Name: {self.name}")
9          print(f"Roll Number: {self.roll_number}")
10         print(f"Branch: {self.branch}")
11
12 if __name__ == "__main__":
13     s = Student("Alice Smith", "CS2026", "Computer Science")
14     s.display_details()

PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    PORTS
conda : The term 'conda' is not recognized as the name of a cmdlet, func
+ conda activate Shashidhar
+ ~~~~~
+ CategoryInfo          : ObjectNotFound: (conda:String) [], CommandNot
+ FullyQualifiedErrorId : CommandNotFoundException

PS C:\Users\shash\Downloads\counter-app> & 'c:\Users\shash\anaconda3\envs\v
\vscode\extensions\ms-python.debugpy-2025.18.0-win32-x64\bundled\libs\d
hash\Downloads\counter-app\AAC A 6.3.py'
● Name: Alice Smith
● Roll Number: CS2026
● Branch: Computer Science
○ PS C:\Users\shash\Downloads\counter-app>

```

Task Description #2: Loops (Multiples of a Number)

Scenario

You are writing a utility function to display multiples of a given number.

Task

- Prompt the AI tool to generate a function that prints the first 10 multiples of a given number using a loop.
- Analyze the generated loop logic.
- Ask the AI to generate the same functionality using another controlled looping structure (e.g., while instead of for).

Expected Output #2

- Correct loop-based Python implementation.
- Output showing the first 10 multiples of a number.
- Comparison and analysis of different looping approaches.

The screenshot shows a terminal window with the following content:

```
JS resume devops.js      Tomato .html      lab 3 devops.h
C: > Users > shash > Downloads > counter-app > AAC A 6.3.py >
1  def print_multiples_for(n):
2      for i in range(1, 11):
3          print(n * i)
4
5  def print_multiples_while(n):
6      i = 1
7      while i <= 10:
8          print(n * i)
9          i += 1
10
11 if __name__ == "__main__":
12     number = 7
13     print("For loop multiples:")
14     print_multiples_for(number)
15     print("While loop multiples:")
16     print_multiples_while(number)

PROBLEMS      OUTPUT      DEBUG CONSOLE      TERMINAL      PORTS

PS C:\Users\shash\Downloads\counter-app> c;; cd 'c:\da3\envs\Shashidhar\python.exe' 'c:\Users\shash\.vscode\libs\debugpy\launcher' '56132' '--' 'c:\Users\shash\For loop multiples:
28
35
42
49
56
63
70
PS C:\Users\shash\Downloads\counter-app>
```

Task Description #3: Conditional Statements (Age Classification)

Scenario

You are building a basic classification system based on age.

Task

- Ask the AI tool to generate nested if-elif-else conditional statements to classify age groups (e.g., child, teenager, adult, senior).
- Analyze the generated conditions and logic.
- Ask the AI to generate the same classification using alternative conditional structures (e.g., simplified conditions or dictionary-based logic).

Expected Output #3

- A Python function that classifies age into appropriate groups.
- Clear and correct conditional logic.
- Explanation of how the conditions work.

```
C:\Users\shash\Downloads\counter-app> AAC A 6.3.py < ...  
1 def classify_age_nested(age):  
2     if age < 0:  
3         return "invalid"  
4     if age <= 12:  
5         return "child"  
6     elif age <= 17:  
7         return "teenager"  
8     elif age <= 64:  
9         return "adult"  
10    else:  
11        return "senior"  
12  
13 def classify_age_simplified(age):  
14     if age < 0:  
15         return "invalid"  
16     if 0 <= age <= 12:  
17         return "child"  
18     if 13 <= age <= 17:  
19         return "teenager"  
20     if 18 <= age <= 64:  
21         return "adult"  
22     return "senior"  
23  
24 def classify_age_dict(age):  
25     if age < 0:  
26         return "invalid"  
27     thresholds = [(12, "child"), (17, "teenager"), (64, "adult"), (float('inf'), "senior")]  
28     for limit, label in thresholds:  
29         if age <= limit:  
30             return label  
31  
32 if __name__ == "__main__":  
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS  
  
PS C:\Users\shash\Downloads\counter-app> cd 'c:\Users\shash\Downloads\counter-app'; & 'c:\Users\shash\python.exe' 'c:\Users\shash\vscode\extensions\ms-python.debugpy-2025.18.0-win32-x64\bundled\lib\site-packages\debugpy\launcher\49215' '--' 'c:\Users\shash\Downloads\counter-app\AAC A 6.3.py'  
Nested if-elif-else:  
-1 invalid  
Dictionary-threshold approach:  
3 child  
15 teenager  
30 adult  
70 senior  
-1 invalid  
PS C:\Users\shash\Downloads\counter-app> []
```

```
C:\> Users > shash > Downloads > counter-app > AAC A 6.3.py > ...
13 def classify_age_simplified(age):
14     if 18 <= age <= 64:
15         return "adult"
16     return "senior"
17
18 def classify_age_dict(age):
19     if age < 0:
20         return "invalid"
21     thresholds = [(12, "child"), (17, "teenager"), (64, "adult"), (float('inf'), "senior")]
22     for limit, label in thresholds:
23         if age <= limit:
24             return label
25
26 if __name__ == "__main__":
27     sample_ages = [3, 15, 30, 70, -1]
28     print("Nested if-elif-else:")
29     for a in sample_ages:
30         print(a, classify_age_nested(a))
31     print("Simplified chained conditions:")
32     for a in sample_ages:
33         print(a, classify_age_simplified(a))
34     print("Dictionary-threshold approach:")
35     for a in sample_ages:
36         print(a, classify_age_dict(a))

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS C:\Users\shash\Downloads\counter-app> c:>; cd 'c:\Users\shash\Downloads\counter-app'; & 'c:\Users\shash\python.exe' 'c:\Users\shash\.vscode\extensions\ms-python.debugpy-2025.18.0-win32-x64\bundle\49215' '--' 'c:\Users\shash\Downloads\counter-app\AAC A 6.3.py'
Nested if-elif-else:
-1 invalid
Dictionary-threshold approach:
3 child
15 teenager
30 adult
70 senior
-1 invalid
PS C:\Users\shash\Downloads\counter-app>
```

Task Description #4: For and While Loops (Sum of First n Numbers)

Scenario

You need to calculate the sum of the first n natural numbers.

Task

- Use AI assistance to generate a `sum_to_n()` function using a for loop.
- Analyze the generated code.
- Ask the AI to suggest an alternative implementation using a while loop or a mathematical formula.

Expected Output #4

- Python function to compute the sum of first n numbers.
- Correct output for sample inputs.
- Explanation and comparison of different approaches.

```

C:\> Users > shash > Downloads > counter-app > AAC A 6.3.py > ...
1 def sum_to_n_for(n):
2     total = 0
3     for i in range(1, n + 1):
4         total += i
5     return total
6
7 def sum_to_n_while(n):
8     total = 0
9     i = 1
10    while i <= n:
11        total += i
12        i += 1
13    return total
14
15 def sum_to_n_formula(n):
16     if n < 0:
17         return None
18     return n * (n + 1) // 2
19
20 if __name__ == "__main__":
21     samples = [0, 1, 10, 100]
22     for n in samples:
23         print(n, sum_to_n_for(n), sum_to_n_while(n), sum_to_n_formula(n))

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```

PS C:\Users\shash\Downloads\counter-app> c;; cd 'c:\Users\shash\Downloads\counter-app' & python.exe 'c:\Users\shash\.vscode\extensions\ms-python-devices\debugpy\launcher' '65013' '--' 'c:\Users\shash\Downloads\counter-app\AAC A 6.3.py'
0 0 0 0
PS C:\Users\shash\Downloads\counter-app> c;; cd 'c:\Users\shash\Downloads\counter-app' & python.exe 'c:\Users\shash\.vscode\extensions\ms-python-devices\debugpy\launcher' '61058' '--' 'c:\Users\shash\Downloads\counter-app\AAC A 6.3.py'
0 0 0 0
1 1 1 1
10 55 55 55
100 5050 5050 5050
PS C:\Users\shash\Downloads\counter-app>

```

Task Description #5: Classes (Bank Account Class)**Scenario**

You are designing a basic banking application.

Task

- Use AI tools to generate a Bank Account class with methods such as deposit(), withdraw(), and check_balance().
- Analyze the AI-generated class structure and logic.
- Add meaningful comments and explain the working of the code.

Expected Output #5

- Complete Python Bank Account class.
- Demonstration of deposit and withdrawal operations with updated balance.
- Well-commented code with a clear explanation.

The screenshot shows a VS Code interface with a terminal window open. The terminal displays Python code for a `BankAccount` class and its execution.

```
C:\> Users > shash > Downloads > counter-app > AAC A 6.3.py > BankAccount > withdraw
 1  class BankAccount:
 2      def __init__(self, owner, balance=0.0):
 3          self.owner = owner
 4          self.balance = float(balance)
 5      def deposit(self, amount):
 6          if amount <= 0:
 7              raise ValueError("Deposit amount must be positive")
 8          self.balance += amount
 9          return self.balance
10      def withdraw(self, amount):
11          if amount <= 0:
12              raise ValueError("Withdrawal amount must be positive")
13          if amount > self.balance:
14              return False
15          self.balance -= amount
16          return True
17      def check_balance(self):
18          return self.balance
19
20      def __repr__(self):
21          return f"BankAccount(owner={self.owner!r}, balance={self.balance:.2f})"
22
23
24  if __name__ == "__main__":
25      owner = input("Enter account owner name: ").strip()
26      bal = input("Enter starting balance (leave empty for 0): ").strip()
27      try:
28          start_balance = float(bal) if bal else 0.0
29      except ValueError:
30          start_balance = 0.0
31      acct = BankAccount(owner or "Unknown", start_balance)
32      print("Account created:", acct)

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS C:\Users\shash\Downloads\counter-app> c:> cd 'c:\Users\shash\Downloads\counter-app'
da3\envs\Shashidhar\python.exe' 'c:\Users\shash\.vscode\extensions\ms-python.debugpy-20
libs\debugpy\launcher' '63018' '--' 'c:\Users\shash\Downloads\counter-app\AAC A 6.3.py'
Enter account owner name: Shashidhar Ashadapu
Enter starting balance (leave empty for 0): 1000
Account created: BankAccount(owner='Shashidhar Ashadapu', balance=1000.00)

Options: [d]eposit, [w]ithdraw, [c]heck balance, [q]uit
Choose option: w
Amount to withdraw: 500
Success: True Balance: 500.0
```

Note: Report should be submitted as a word document for all tasks in a single document with prompts, comments & code explanation, and output and if required, screenshots.