

<b>SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE</b>		<b>DEPARTMENT OF COMPUTER SCIENCE ENGINEERING</b>																		
<b>Program Name:</b> B. Tech		<b>Assignment Type:</b> Lab	<b>Academic Year:</b> 2025-2026																	
<b>Course Coordinator Name</b>		Dr. Rishabh Mittal																		
<b>Instructor(s) Name</b>		<table border="1"> <tr><td>Mr. S Naresh Kumar</td></tr> <tr><td>Ms. B. Swathi</td></tr> <tr><td>Dr. Sasanko Shekhar Gantayat</td></tr> <tr><td>Mr. Md Sallauddin</td></tr> <tr><td>Dr. Mathivanan</td></tr> <tr><td>Mr. Y Srikanth</td></tr> <tr><td>Ms. N Shilpa</td></tr> <tr><td>Dr. Rishabh Mittal (Coordinator)</td></tr> <tr><td>Dr. R. Prashant Kumar</td></tr> <tr><td>Mr. Ankushavali MD</td></tr> <tr><td>Mr. B Viswanath</td></tr> <tr><td>Ms. Sujitha Reddy</td></tr> <tr><td>Ms. A. Anitha</td></tr> <tr><td>Ms. M.Madhuri</td></tr> <tr><td>Ms. Katherashala Swetha</td></tr> <tr><td>Ms. Velpula sumalatha</td></tr> <tr><td>Mr. Bingi Raju</td></tr> </table>		Mr. S Naresh Kumar	Ms. B. Swathi	Dr. Sasanko Shekhar Gantayat	Mr. Md Sallauddin	Dr. Mathivanan	Mr. Y Srikanth	Ms. N Shilpa	Dr. Rishabh Mittal (Coordinator)	Dr. R. Prashant Kumar	Mr. Ankushavali MD	Mr. B Viswanath	Ms. Sujitha Reddy	Ms. A. Anitha	Ms. M.Madhuri	Ms. Katherashala Swetha	Ms. Velpula sumalatha	Mr. Bingi Raju
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<b>Course Code</b>	23CS002PC304	<b>Course Title</b>	AI Assisted Coding																	
<b>Year/Sem</b>	III/II	<b>Regulation</b>	R23																	
<b>Date and Day of Assignment</b>	<b>Week3 – Wednesday</b>	<b>Time(s)</b>	23CSBTB01 To 23CSBTB52																	
<b>Duration</b>	2 Hours	<b>Applicable to Batches</b>	All batches																	
<b>AssignmentNumber:</b> 6.3(Present assignment number)/24(Total number of assignments)																				
<b>Q.No.</b>	<b>Question</b>	<b>Expected Time to complete</b>																		
1	<b>Lab 6: AI-Based Code Completion – Classes, Loops, and Conditionals</b> <b>Lab Objectives</b> <ul style="list-style-type: none"> <li>• To explore AI-powered auto-completion features for core Python constructs such as classes, loops, and conditional statements.</li> <li>• To analyze how AI tools suggest logic for object-oriented programming and control structures.</li> </ul>	Week3 - Wednesday																		

- To evaluate the correctness, readability, and completeness of AI-generated Python code.

### Lab Outcomes (LOs)

After completing this lab, students will be able to:

- 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.

### Task Description #1: Classes (Student Class)

#### Scenario

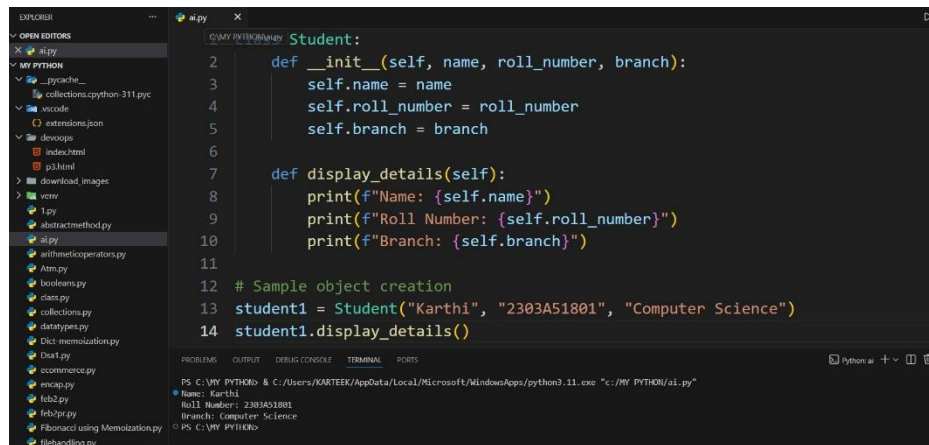
You are developing a simple student information management module.

#### Task

- 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 display\_details() to print student information.
- Execute the code and verify the output.
- Analyze the code generated by the AI tool for correctness and clarity.

#### Expected Output #1

- 



```
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 # Sample object creation
13 student1 = Student("Karthi", "2303A51801", "Computer Science")
14 student1.display_details()
```

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

PS C:\MY PYTHON> & C:/Users/KARTEEK/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/MY PYTHON/ai.py"

• Name: Karthi  
• Roll Number: 2303A51801  
• Branch: Computer Science

PS C:\MY PYTHON>

### 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

The image shows a Visual Studio Code editor window with a file named `lab5.py` open. The code in the editor is as follows:

```

6         self.branch = branch
7
8     def display_details(self):
9         print(f"Name: {self.name}")
10        print(f"Roll Number: {self.roll_number}")
11        print(f"Branch: {self.branch}")
12
13    # Example usage
14    student1 = Student("Arun", "1735", "Computer Science")
15    student1.display_details()"""
16
17    # Write a Python function print_multiples(n) that prints first 10 multiples of n using for loop
18    def print_multiples(n):
19        for i in range(1, 11):
20            print(n * i)
21
22    # Example usage
23    print_multiples(5)

```

The terminal at the bottom shows the command to run the script:

```

PS C:\Users\aruni\ai asst coding> & C:/Python314/python.exe "c:/Users/aruni/ai asst coding/lab5.py"

```

[illegible]

### 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

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```
29 #Create Python function classify_age(age) with nested if-elif-else to classify: child(<13), te
30 def classify_age(age):
31     if age < 13:
32         return "Child"
33     else:
34         if 13 <= age <= 19:
35             return "Teenager"
36         else:
37             if 20 <= age <= 59:
38                 return "Adult"
39             else:
40                 return "Senior"
41 # Example usage
42 print(classify_age(10)) # Output: Child
43 print(classify_age(16)) # Output: Teenager
44 print(classify_age(25)) # Output: Adult
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```

```
45 #Rewrite classify_age(age) using dictionary mapping instead of if-elif statements
46 def classify_age(age):
47     age_groups = {
48         "Child": range(0, 13),
49         "Teenager": range(13, 20),
50         "Adult": range(20, 60),
51         "Senior": range(60, 150) # Assuming max age as 150
52     }
53
54     for group, age_range in age_groups.items():
55         if age in age_range:
56             return group
57 # Example usage
58 print(classify_age(10)) # Output: Child
59 print(classify_age(16)) # Output: Teenager
60 print(classify_age(25)) # Output: Adult
61 print(classify_age(70)) # Output: Senior
```

```
PS C:\Users\aruni\ai asst coding> C:/Python314/python.exe "c:/Users/aruni/ai asst coding/lab5.py"
Child
Teenager
Adult
```

```
PS C:\Users\aruni\ai asst coding> C:/Python314/python.exe "c:/Users/aruni/ai asst coding/lab5.py"
Child
Teenager
Adult
Senior
```

### 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

-

lab5.py

```
56         return group
57     # Example usage
58     print(classify_age(10)) # Output: Child
59     print(classify_age(16)) # Output: Teenager
60     print(classify_age(25)) # Output: Adult
61     print(classify_age(70)) # Output: Senior"""
62 #Write Python function sum_to_n(n) using for loop to calculate sum of first n natural numbers
63 def sum_to_n(n):
64     total = 0
65     for i in range(1, n + 1):
66         total += i
67     return total
68
69 # Example usage
70 print(sum_to_n(5)) # Output: 15
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```

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● PS C:\Users\aruni\ai asst coding> & C:/Python314/python.exe "c:/Users/aruni/ai asst coding/lab5.py"
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lab5.py

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68
69 # Example usage
70 print(sum_to_n(5)) # Output: 15"""
71 #convert sum_to_n(n) to use while loop instead of for loop
72 def sum_to_n(n):
73     total = 0
74     i = 1
75     while i <= n:
76         total += i
77         i += 1
78     return total
79 # Example usage
80 print(sum_to_n(5)) # Output: 15
81
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lab5.py

```
73     total = 0
74     i = 1
75     while i <= n:
76         total += i
77         i += 1
78     return total
79 # Example usage
80 print(sum_to_n(5)) # Output: 15"""
81 #Add mathematical formula version to sum_to_n(n) function as alternative to loops
82 def sum_to_n(n):
83     # Using the formula n(n + 1) / 2
84     return n * (n + 1) // 2
85 # Example usage
86 print(sum_to_n(5)) # Output: 15
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● PS C:\Users\aruni\ai asst coding> & C:/Python314/python.exe "c:/Users/aruni/ai asst coding/lab5.py"
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## Task Description #5: Classes (Bank Account Class)

### Scenario

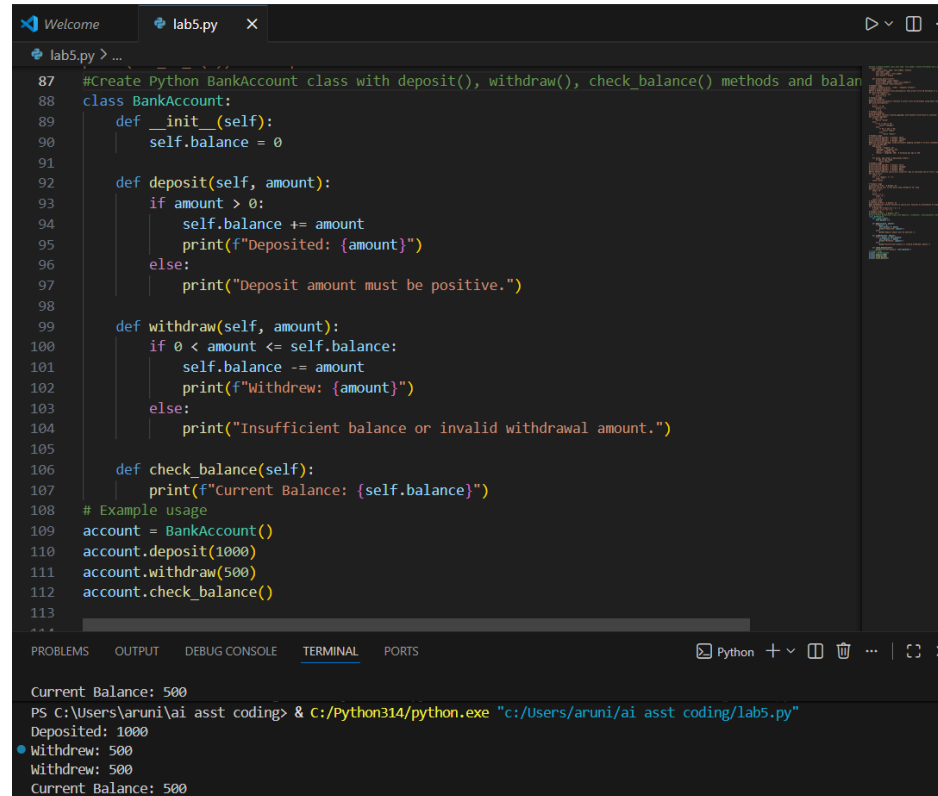
You are designing a basic banking application.

### 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

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```
87 #Create Python BankAccount class with deposit(), withdraw(), check_balance() methods and balan
88 class BankAccount:
89     def __init__(self):
90         self.balance = 0
91
92     def deposit(self, amount):
93         if amount > 0:
94             self.balance += amount
95             print(f"Deposited: {amount}")
96         else:
97             print("Deposit amount must be positive.")
98
99     def withdraw(self, amount):
100         if 0 < amount <= self.balance:
101             self.balance -= amount
102             print(f"Withdrew: {amount}")
103         else:
104             print("Insufficient balance or invalid withdrawal amount.")
105
106     def check_balance(self):
107         print(f"Current Balance: {self.balance}")
108 # Example usage
109 account = BankAccount()
110 account.deposit(1000)
111 account.withdraw(500)
112 account.check_balance()
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```
Current Balance: 500
PS C:\Users\aruni\ai asst coding> C:/Python314/python.exe "c:/Users/aruni/ai asst coding/lab5.py"
Deposited: 1000
Withdrawn: 500
Withdrawn: 500
Current Balance: 500
```

**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.