

ASSIGNMENT-6.3

Name: Y. Poojitha

HT. No: 2303A51499

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Lab 6: AI-Based Code Completion – Classes, Loops, and Conditionals

Task Description #1: Classes (Student Class)

Scenario

You are developing a simple student information management module.

The screenshot shows a code editor window with a Python file named AIAC.py. The code defines a Student class with __init__ and get_grade methods, creates two instances (student1, student2), and prints their names and grades. Below the code editor is a terminal window showing the execution of the script and its output.

```
AIAC.py > ...
1  #Classes (Student Class)
2  class Student:
3      def __init__(self, name, age, grade):
4          self.name = name
5          self.age = age
6          self.grade = grade
7
8      def get_grade(self):
9          return self.grade
10 #Creating instances of the Student class
11 student1 = Student("Alice", 20, 85)
12 student2 = Student("Bob", 22, 90)
13 #Accessing attributes and methods of the Student instances
14 print(student1.name) # Output: Alice
15 print(student1.get_grade()) # Output: 85
16 print(student2.name) # Output: Bob
17 print(student2.get_grade()) # Output: 90
18
```

PROBLEMS TERMINAL OUTPUT DEBUG CONSOLE PORTS POSTMAN CONSOLE Filter (e.g. text, excludeText, t...) Code

```
[Running] python -u "d:\python_dsa\AIAC.py"
Alice
85
Bob
90
```

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).

```
1 #Task2
2 #generate the same functionality using another controlled looping structure
3 def print_multiples(num):
4     for i in range(1, 11):
5         print(num * i)
6 print_multiples(5)
7 def print_multiples_while(num):
8     i = 1
9     while i <= 10:
10        print(num * i)
11        i += 1
12
13 print_multiples_while(5)

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```

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).

```

1 #Task3
2 #to generate nested if-elif-else conditional statements to classify age groups
  (e.g., child, teenager, adult, senior).
3
4 def classify_age(age):
5     if age < 13:
6         return "Child"
7     elif age < 20:
8         return "Teenager"
9     elif age < 60:
10        return "Adult"
11    else:
12        return "Senior"
13
14 print(classify_age(25))

```

Adult

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.

```

1 #Task4
2 #For and While Loops (Sum of First n Numbers)
3 def sum_to_n(n):
4     total = 0
5     for i in range(1, n + 1):
6         total += i
7     return total
8
9 print(sum_to_n(10))
10 def sum_to_n_while(n):
11     total = 0
12     i = 1
13     while i <= n:
14         total += i
15         i += 1
16     return total
17
18 print(sum_to_n_while(10))

```

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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.

```
1 #Task5
2 #generate a Bank Account class with methods such as deposit(), withdraw(), and
3 #check_balance().
4
5 class BankAccount:
6     def __init__(self, account_holder, balance=0):
7         self.account_holder = account_holder
8         self.balance = balance
9
10    def deposit(self, amount):
11        self.balance += amount
12        print("Deposited:", amount)
13
14    def withdraw(self, amount):
15        if amount <= self.balance:
16            self.balance -= amount
17            print("Withdrawn:", amount)
18        else:
19            print("Insufficient balance")
20
21    def check_balance(self):
22        print("Current Balance:", self.balance)
23
24 # Object creation
25 account = BankAccount("Vyshnavi", 5000)
26 account.deposit(2000)
27 account.withdraw(1500)
28 account.check_balance()
```

```
Deposited: 2000
Withdrawn: 1500
Current Balance: 5500
```