

# AI Assisted Coding

## Assignment 6.3

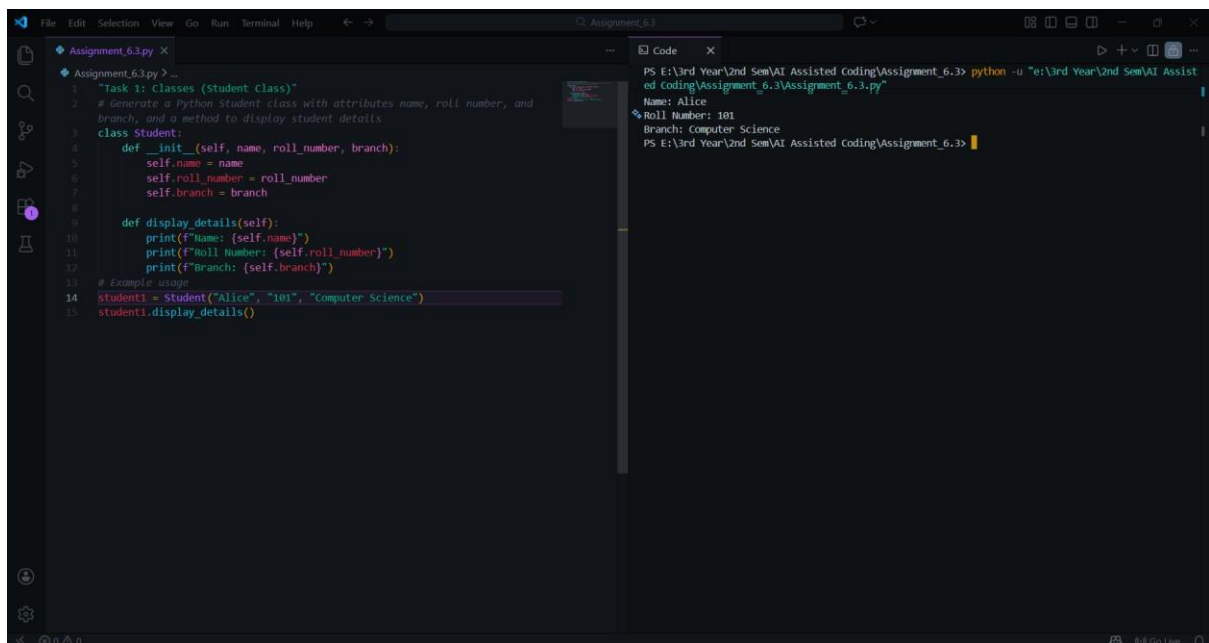
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Hall ticket no: 2303a51938  
Batch no: 19

### Task 1: Classes (Student Class)

#### Prompt:

Generate a Python Student class with attributes name, roll number, and branch, and a method to display student details.

#### Code & Output:



```
File Edit Selection View Go Run Terminal Help
Assignment_6.3
Assignment_6.3.py X
1 "Task 1: Classes (Student Class)"
2 # Generate a Python Student class with attributes name, roll number, and
3 branch, and a method to display student details
4 class Student:
5     def __init__(self, name, roll_number, branch):
6         self.name = name
7         self.roll_number = roll_number
8         self.branch = branch
9
10    def display_details(self):
11        print(f"Name: {self.name}")
12        print(f"Roll Number: {self.roll_number}")
13        print(f"Branch: {self.branch}")
14
15    # Example usage
16    student1 = Student("Alice", "101", "Computer Science")
17    student1.display_details()
```

```
PS E:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3> python -u "e:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3\Assignment_6.3.py"
Name: Alice
Roll Number: 101
Branch: Computer Science
PS E:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3>
```

#### Explanation:

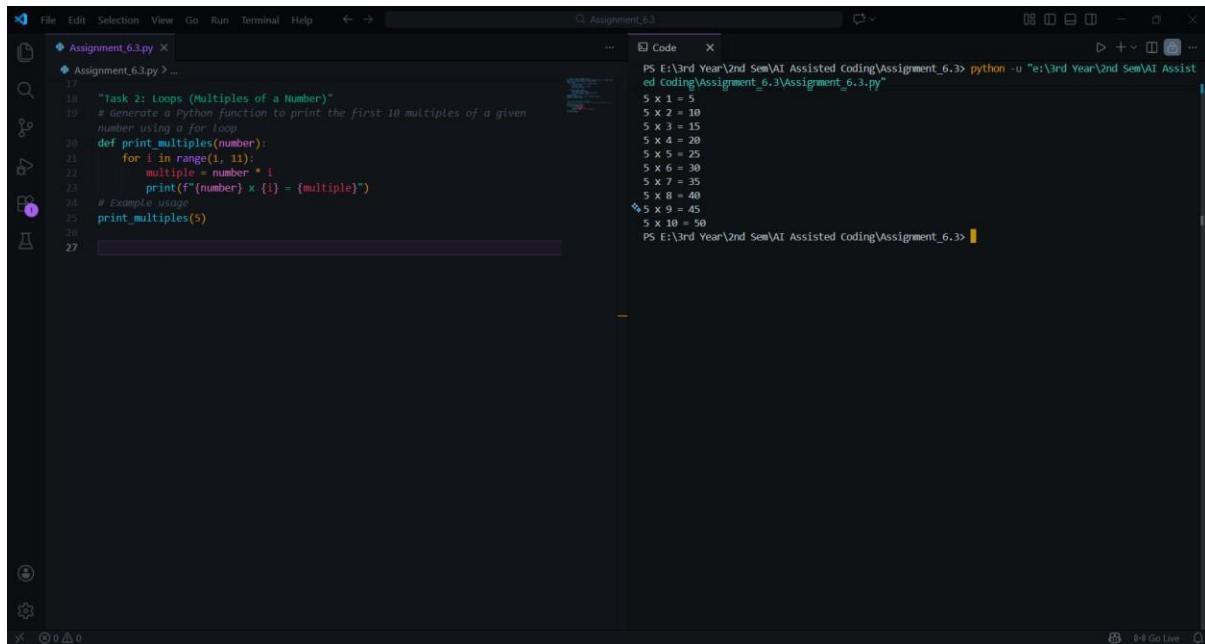
The AI-generated code correctly defines a Student class using object-oriented principles. The constructor initializes student attributes, and the display\_details() method prints them clearly. The class structure is simple, readable, and functions correctly when an object is created and executed.

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

## Prompt:

Generate a Python function to print the first 10 multiples of a given number using a for loop.

## Code & Output:



The screenshot shows a code editor with a Python file named 'Assignment\_6.3.py'. The code defines a function 'print\_multiples' that takes a 'number' as input and prints the first 10 multiples using a for loop. The function is called with the argument 5. The output window shows the results of the function call, displaying the first 10 multiples of 5.

```
17
18 "Task 2: Loops (Multiples of a Number)"
19 # Generate a python function to print the first 10 multiples of a given
   number using a for loop
20 def print_multiples(number):
21     for i in range(1, 11):
22         multiple = number * i
23         print(f"{number} x {i} = {multiple}")
24 # Example usage
25 print_multiples(5)
26
27
```

```
PS E:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3> python -u "E:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3\Assignment_6.3.py"
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
PS E:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3>
```

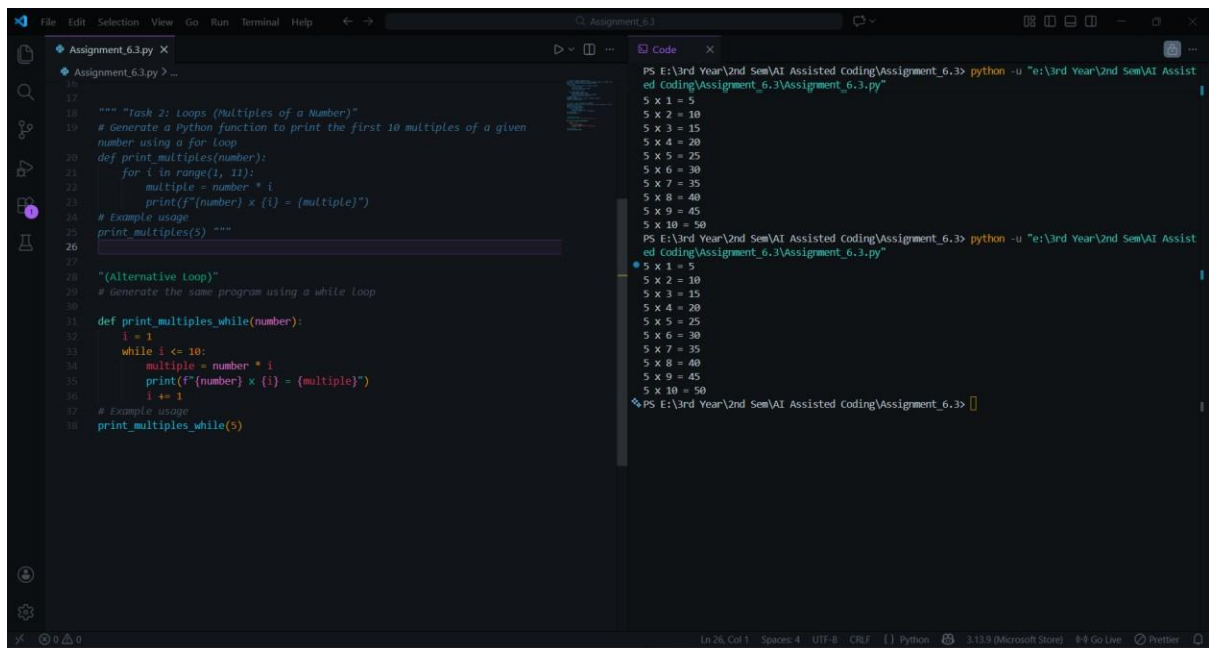
## Explanation:

The AI-generated function uses a for loop to iterate from 1 to 10 and prints the multiples of the given number. In each iteration, the loop variable is multiplied by the input number. The loop boundaries are correctly defined, and the logic produces accurate results. This implementation is efficient and readable, making it ideal for tasks with a fixed number of iterations.

## Prompt (Alternative Loop):

Generate the same program using a while loop

## Code & Output:



```
Assignment_6.3.py X
16
17
18 """Task 2: Loops (Multiples of a Number)"""
19 # Generate a Python function to print the first 10 multiples of a given
    number using a for loop
20 def print_multiples(number):
21     for i in range(1, 11):
22         multiple = number * i
23         print(f"{number} x {i} = {multiple}")
24 # Example usage
25 print_multiples(5)
26
27
28 "(Alternative loop)"
29 # Generate the same program using a while loop
30
31 def print_multiples_while(number):
32     i = 1
33     while i <= 10:
34         multiple = number * i
35         print(f"{number} x {i} = {multiple}")
36         i += 1
37 # Example usage
38 print_multiples_while(5)
```

```
Code X
PS E:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3> python -u "e:\3rd Year\2nd Sem\AI Assist
ed Coding\Assignment_6.3\Assignment_6.3.py"
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5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
PS E:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3> python -u "e:\3rd Year\2nd Sem\AI Assist
ed Coding\Assignment_6.3\Assignment_6.3.py"
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
PS E:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3>
```

### Explanation:

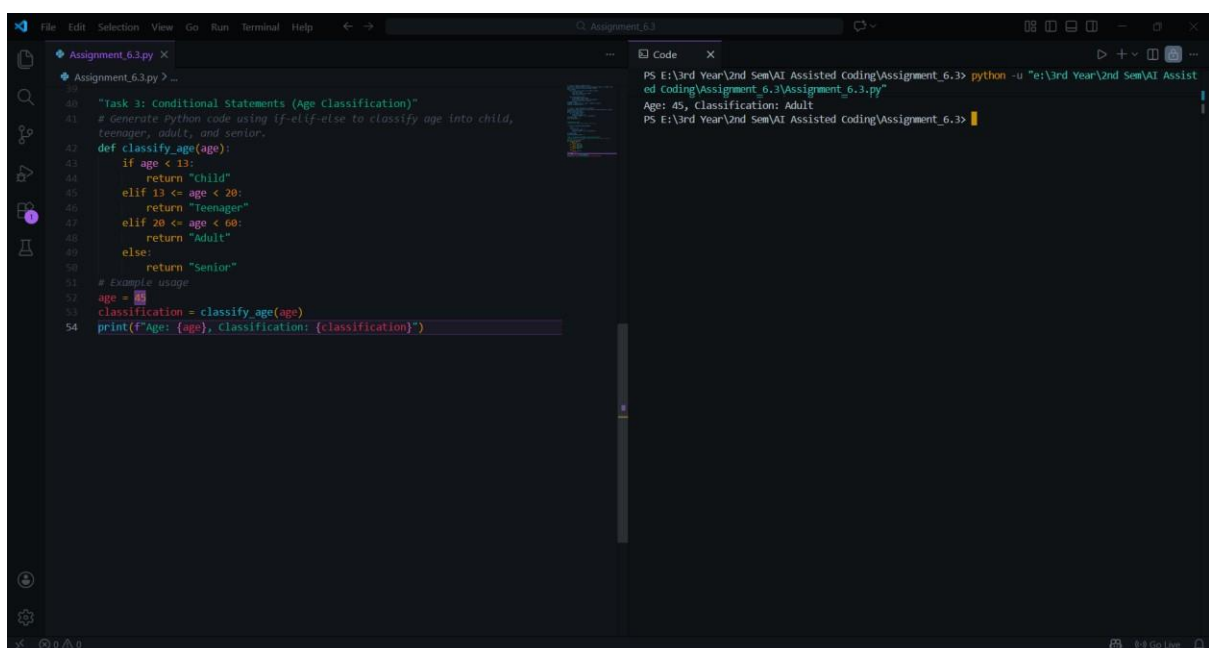
The while-loop version produces the same output as the for-loop version. While loops require manual control of the counter variable, making the for loop slightly cleaner and more readable for fixed iterations.

## Task 3: Conditional Statements (Age Classification)

### Prompt:

Generate Python code using if-elif-else to classify age into child, teenager, adult, and senior.

### Code & Output:



```
Assignment_6.3.py X
40
41 """Task 3: Conditional Statements (Age Classification)"""
42 # Generate Python code using if-elif-else to classify age into child,
    teenager, adult, and senior.
43 def classify_age(age):
44     if age < 13:
45         return "Child"
46     elif 13 <= age < 20:
47         return "Teenager"
48     elif 20 <= age < 60:
49         return "Adult"
50     else:
51         return "Senior"
52 # Example usage
53 age = 45
54 classification = classify_age(age)
55 print(f"Age: {age}, Classification: {classification}")
```

```
Code X
PS E:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3> python -u "e:\3rd Year\2nd Sem\AI Assist
ed Coding\Assignment_6.3\Assignment_6.3.py"
Age: 45, Classification: Adult
PS E:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3>
```

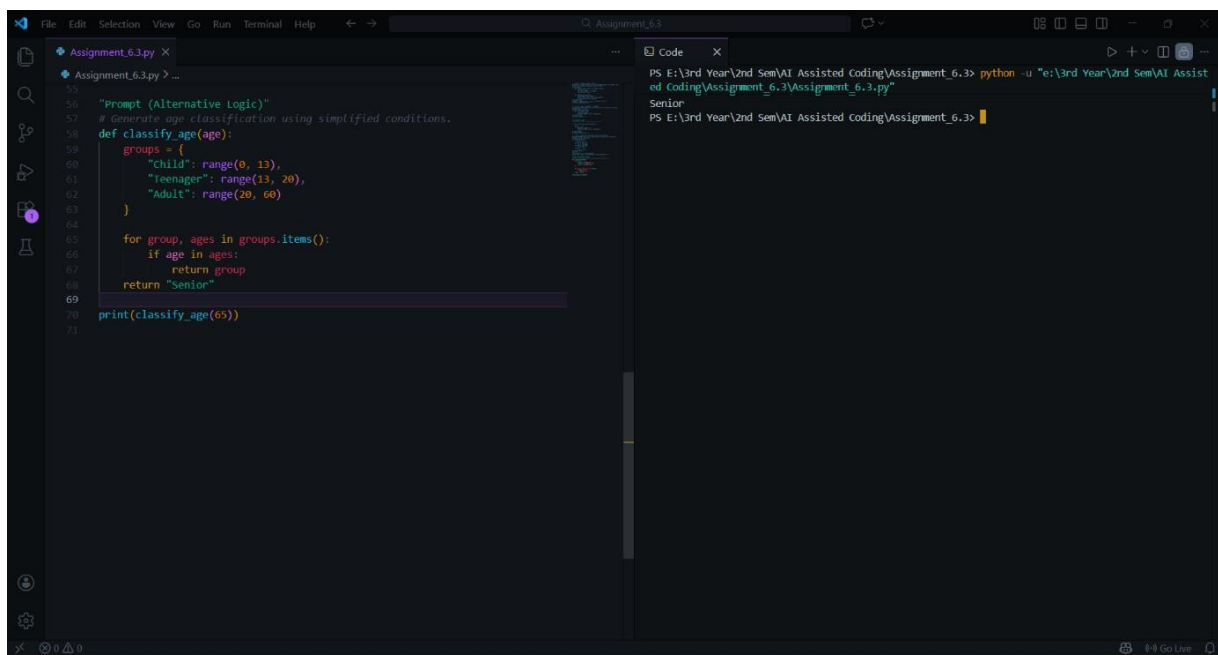
### Explanation:

The AI-generated function uses nested if-elif-else conditions to classify age groups. Each condition checks a specific age range in increasing order. The structure ensures that only one category is returned for a given age. The logic is clear, correct, and easy to verify, making the code understandable for beginners and suitable for real-world classification tasks.

### Prompt (Alternative Logic):

Generate age classification using simplified conditions.

### Code & Output:



```
Assignment_6.3.py
55
56 "Prompt (Alternative Logic)"
57 # Generate age classification using simplified conditions.
58
59 def classify_age(age):
60     groups = {
61         "Child": range(0, 13),
62         "Teenager": range(13, 20),
63         "Adult": range(20, 60)
64     }
65
66     for group, ages in groups.items():
67         if age in ages:
68             return group
69     return "Senior"
70
71 print(classify_age(65))
72
```

```
PS E:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3> python -u "e:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3\Assignment_6.3.py"
PS E:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3>
Senior
```

### Explanation:

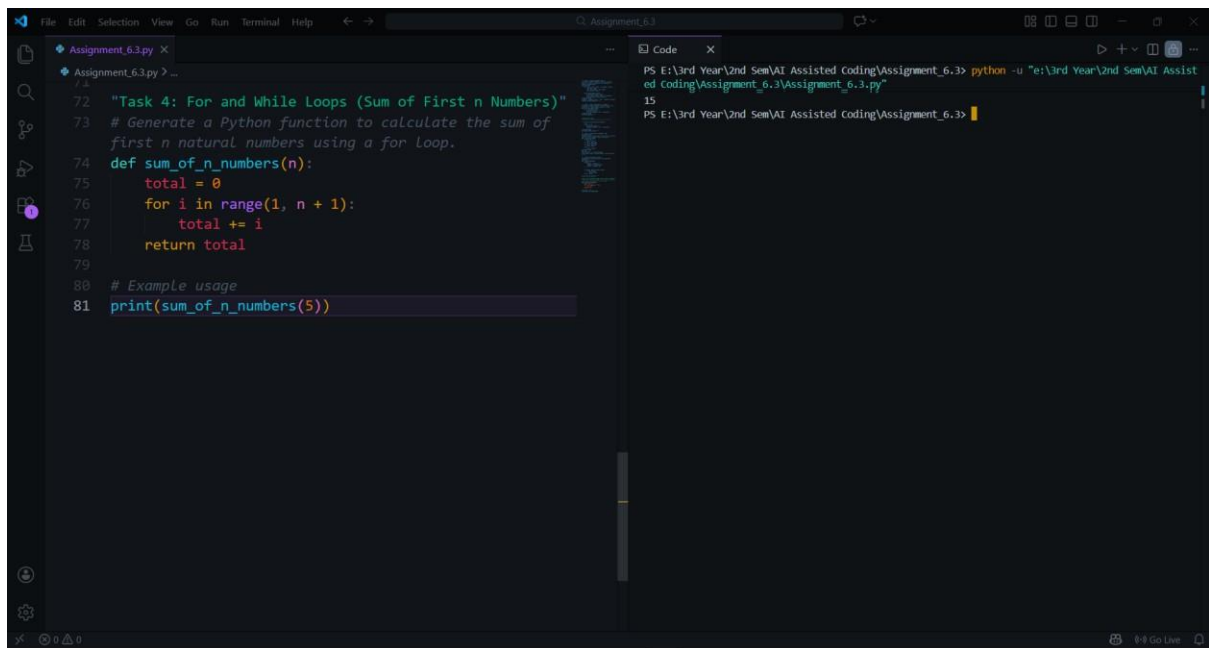
This alternative approach uses a dictionary and a loop to determine the age group. While this method is flexible and scalable, it is more complex than the if-elif-else approach. For simple classification problems, the original conditional structure is more readable and easier to maintain.

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

### Prompt:

Generate a Python function to calculate the sum of first n natural numbers using a for loop.

### Code & Output:



The screenshot shows a Visual Studio Code editor with a file named `Assignment_6.3.py`. The code defines a function `sum_of_n_numbers(n)` that calculates the sum of the first `n` natural numbers using a `for` loop. The function initializes a `total` variable to 0 and iterates from 1 to `n`, adding each number to the total. An example usage is shown with `print(sum_of_n_numbers(5))`. The terminal on the right shows the command `python -u "e:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3\Assignment_6.3.py"` being executed, resulting in the output `15`.

```
72 "Task 4: For and While Loops (Sum of First n Numbers)"
73 # Generate a Python function to calculate the sum of
74   first n natural numbers using a for loop.
75
76 def sum_of_n_numbers(n):
77     total = 0
78     for i in range(1, n + 1):
79         total += i
80     return total
81
82 # Example usage
83 print(sum_of_n_numbers(5))
```

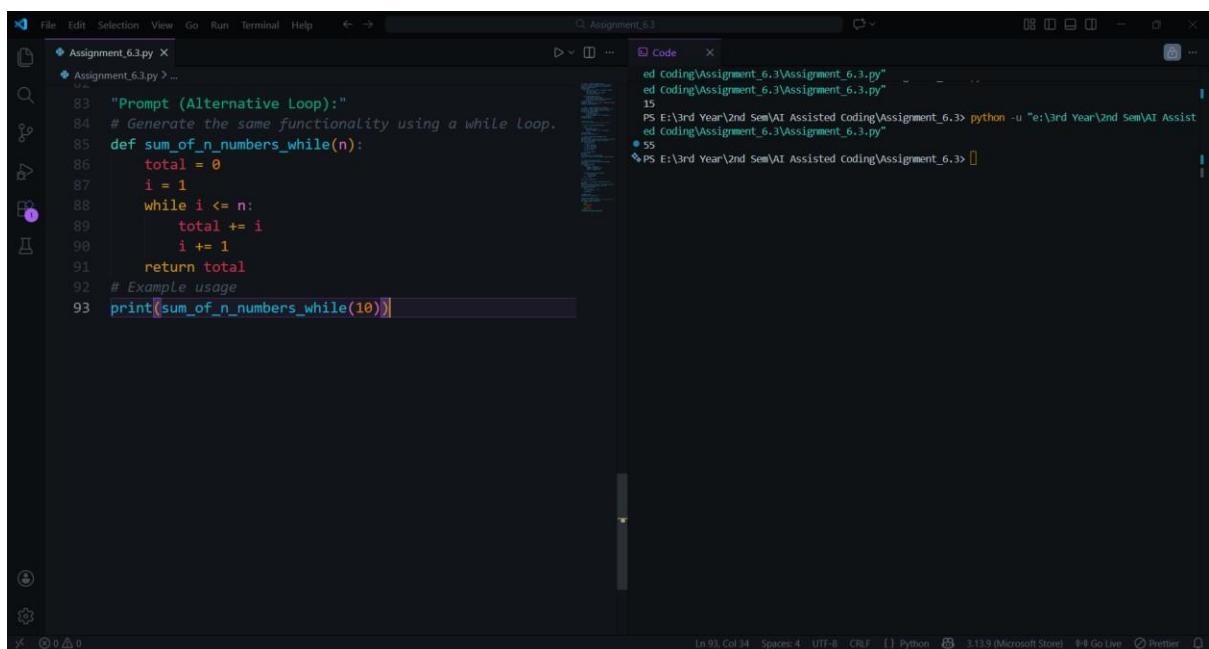
### Explanation:

The AI-generated function calculates the sum by iterating through numbers from 1 to `n` and adding them to a `total` variable. The loop logic is correct and produces accurate results. This approach is easy to understand and works efficiently for small to moderate values of `n`.

### Prompt (Alternative Loop):

Generate the same functionality using a while loop.

### Code & Output:



The screenshot shows a Visual Studio Code editor with a file named `Assignment_6.3.py`. The code defines a function `sum_of_n_numbers_while(n)` that calculates the sum of the first `n` natural numbers using a `while` loop. The function initializes a `total` variable to 0 and a counter `i` to 1. It then enters a `while` loop that continues as long as `i` is less than or equal to `n`, adding `i` to the total and incrementing `i` by 1. An example usage is shown with `print(sum_of_n_numbers_while(10))`. The terminal on the right shows the command `python -u "e:\3rd Year\2nd Sem\AI Assisted Coding\Assignment_6.3\Assignment_6.3.py"` being executed, resulting in the output `55`.

```
83 "Prompt (Alternative Loop):"
84 # Generate the same functionality using a while loop.
85
86 def sum_of_n_numbers_while(n):
87     total = 0
88     i = 1
89     while i <= n:
90         total += i
91         i += 1
92     return total
93
94 # Example usage
95 print(sum_of_n_numbers_while(10))
```

### Explanation:

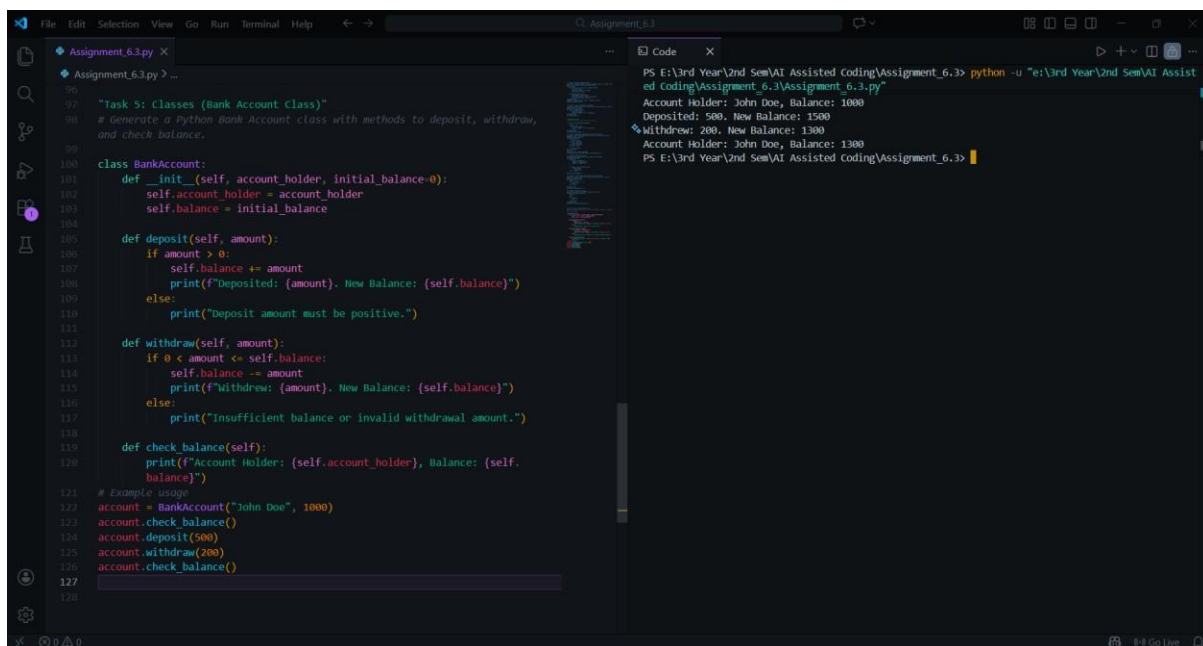
The while-loop version produces the same output as the for-loop version. While loops require manual control of the counter variable, making the for loop slightly cleaner and more readable for fixed iterations.

## Task 5: Classes (Bank Account Class)

### Prompt:

Generate a Python Bank Account class with methods to deposit, withdraw, and check balance.

### Code & Output:



```
Assignment_6.3.py
179
180 "Task 5: Classes (Bank Account Class)"
181 # Generate a Python Bank Account class with methods to deposit, withdraw,
182 and check balance.
183
184
185 class BankAccount:
186     def __init__(self, account_holder, initial_balance=0):
187         self.account_holder = account_holder
188         self.balance = initial_balance
189
190     def deposit(self, amount):
191         if amount > 0:
192             self.balance += amount
193             print(f"Deposited: {amount}. New Balance: {self.balance}")
194         else:
195             print("Deposit amount must be positive.")
196
197     def withdraw(self, amount):
198         if 0 < amount <= self.balance:
199             self.balance -= amount
200             print(f"Withdraw: {amount}. New Balance: {self.balance}")
201         else:
202             print("Insufficient balance or invalid withdrawal amount.")
203
204     def check_balance(self):
205         print(f"Account Holder: {self.account_holder}, Balance: {self.
206             balance}")
207
208 # Example usage
209 account = BankAccount("John Doe", 1000)
210 account.check_balance()
211 account.deposit(500)
212 account.withdraw(200)
213 account.check_balance()
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