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

Week 3 – Wednesday

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Task 1: Classes – Student Class

Prompt Used:

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

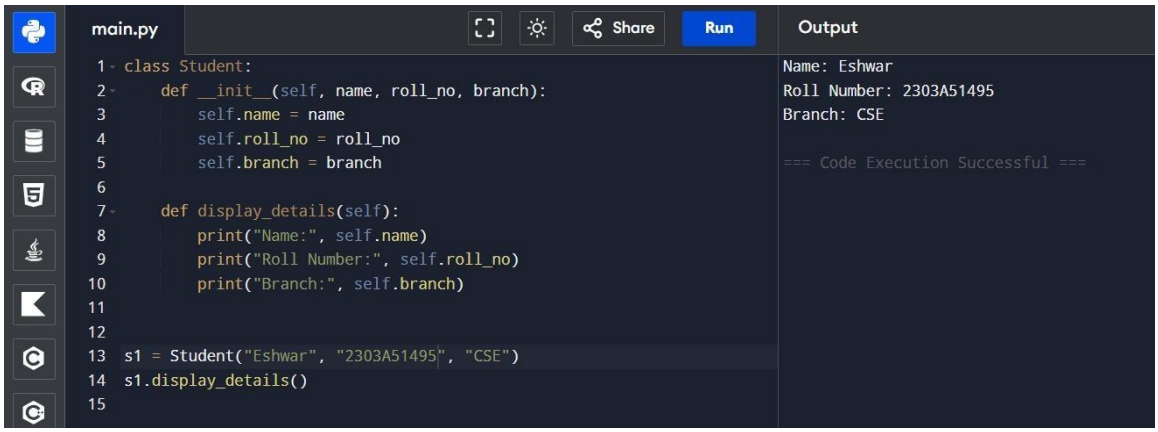
```
class Student:
    def __init__(self, name, roll_no, branch):
        self.name = name
        self.roll_no = roll_no
        self.branch = branch

    def display_details(self):
        print("Name:", self.name)
        print("Roll Number:", self.roll_no)
        print("Branch:", self.branch)


s1 = Student("Eshwar", "2303A51495", "CSE")
s1.display_details()
```

Output:

Name: Eshwar
Roll Number: 2303A51495
Branch: CSE

Analysis:

The AI-generated class is well-structured, readable, and correctly uses a constructor and instance method.



Task 2: Loops – Multiples of a Number

Prompt Used:
"Generate Python code to print first 10 multiples of a number using loops."

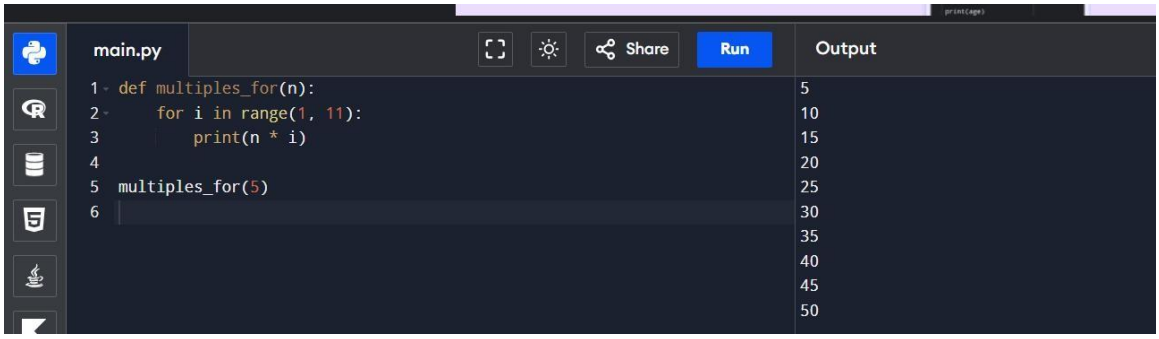
Using for loop:

```
def multiples_for(n):
   for i in range(1, 11):
print(n * i) multiples_for(5)
```

Using while loop:

```
def multiples_while(n):
   i = 1 while i <= 10:
   print(n * i) i += 1

multiples_while(5)
```

Output:
5 10 15 20 25 30 35 40 45 50



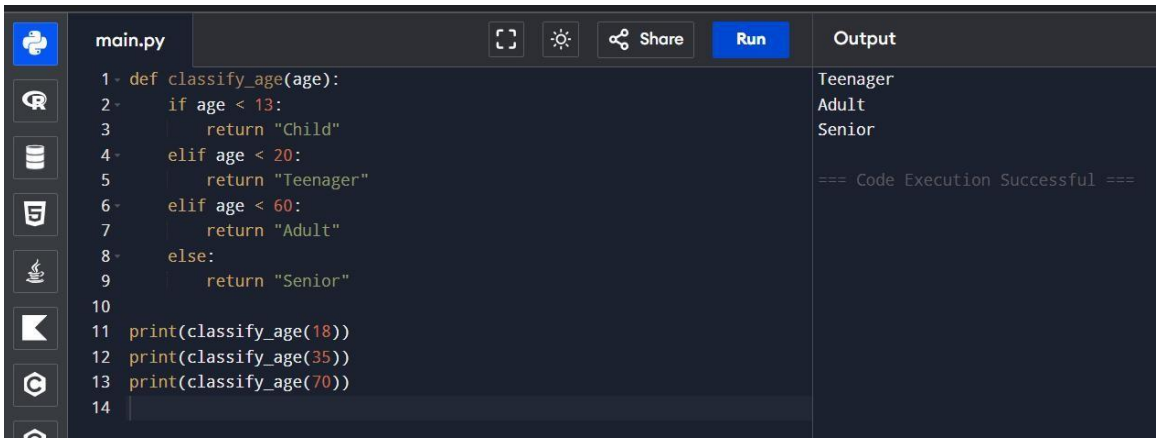
Analysis:
The for loop is concise and readable, while the while loop provides explicit control over iteration.

Task 3: Conditional Statements – Age Classification

Prompt Used:
"Generate Python code to classify age using if-elif-else."

```
def classify_age(age):
   if age < 13: return
   "Child"
   elif age < 20: return
      "Teenager"
   elif age < 60:
      return "Adult"
else: return "Senior"
print(classify_age(18))
```

Output:
Teenager



Explanation:

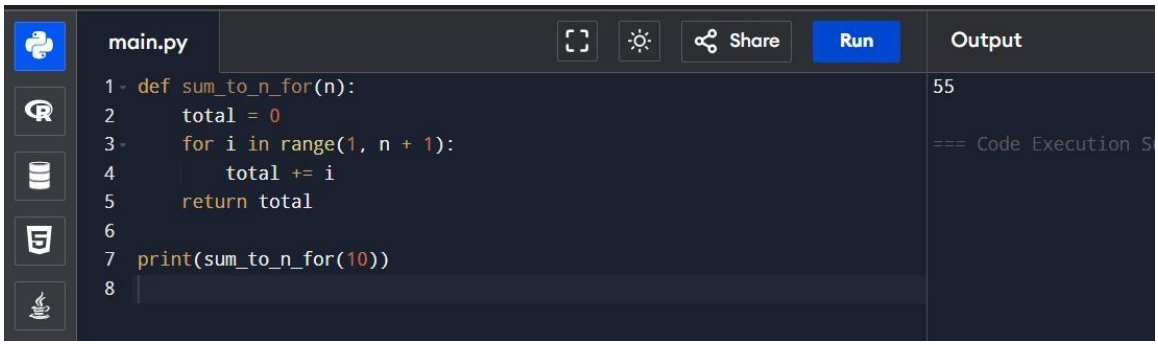
The conditions are checked in sequence. The first matching condition determines the age group.

Task 4: For and While Loops – Sum of First n Numbers

Prompt Used:
"Generate Python code to find sum of first n natural numbers using loops."

Using for loop:

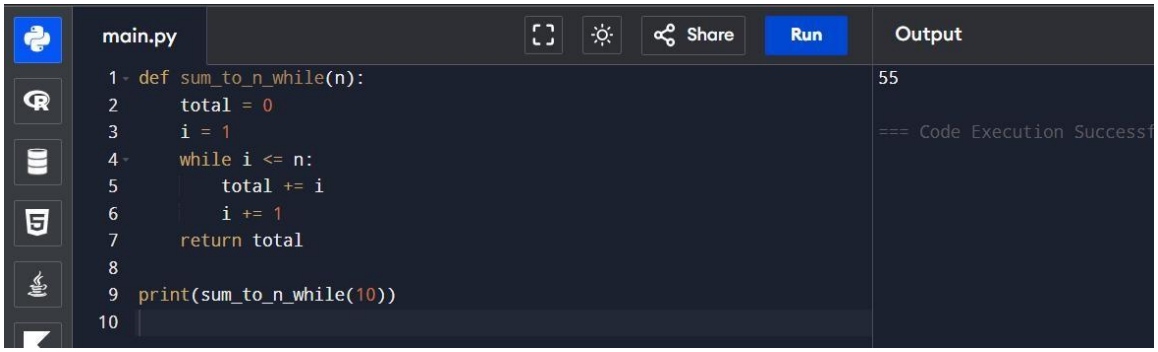
```
def sum_to_n_for(n):
   total = 0 for i in
   range(1, n + 1): total
   += i
   return total

print(sum_to_n_for(10))
```



Using while loop:

```
def sum_to_n_while(n):
   total = 0 i =
   1 while i <=
   n: total += i
      i += 1
   return total

print(sum_to_n_while(10))
```

Output:
55



Analysis:
Both approaches are correct. Loop-based methods are simple, while mathematical formulas can be more efficient.

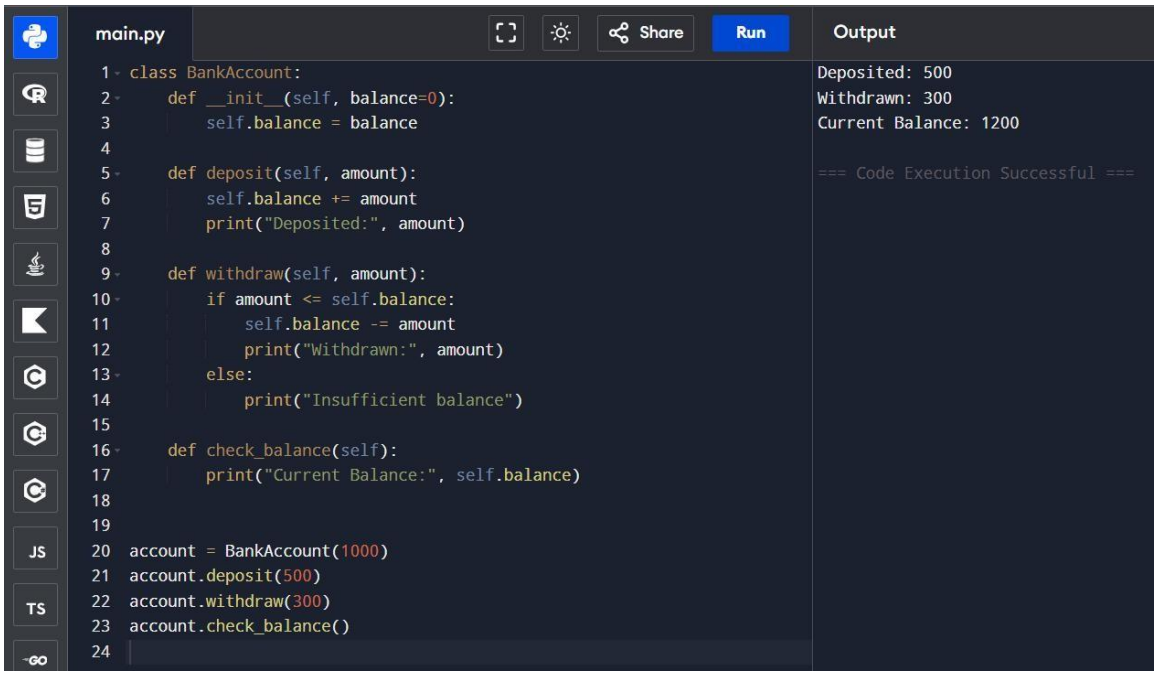
Task 5: Classes – Bank Account Class

Prompt Used:
"Generate a Python BankAccount class with deposit, withdraw, and check balance methods."

```
class BankAccount:
    def __init__(self, balance=0):
        self.balance = balance

    def deposit(self, amount):
        self.balance += amount
        print("Deposited:", amount)

    def withdraw(self, amount):
        if amount <= self.balance:
        self.balance -= amount
        print("Withdrawn:", amount)
        else: print("Insufficient
        balance")

    def check_balance(self): print("Current
        Balance:", self.balance)


account = BankAccount(1000)
account.deposit(500)
account.withdraw(300)
account.check_balance() Output:
Deposited: 500
```

Withdrawn: 300
Current Balance: 1200

Explanation:
The class maintains account balance and updates it through deposit and withdraw methods.



Overall Conclusion

This lab demonstrates how AI-assisted code completion helps in generating structured, readable, and correct Python programs. Human review is essential to ensure correctness and efficiency.