AI Assisted Coding

Lab-6.3

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Batch – 06

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

Week: 3
Day: Wednesday

Lab Objectives

- To explore AI-powered code completion for Python classes, loops, and conditionals.
- To understand how AI suggests object-oriented and control-flow logic.
- To evaluate AI-generated code for correctness, readability, and completeness.

Lab Outcomes

After completing this lab, students will be able to:

- Generate Python classes and methods using AI tools.
- Analyze loop logic suggested by AI.
- Evaluate conditional statements generated by AI.
- Critically assess AI-assisted Python code.

Task Description #1: Classes (Student Class)

Scenario

Develop a simple student information management module.

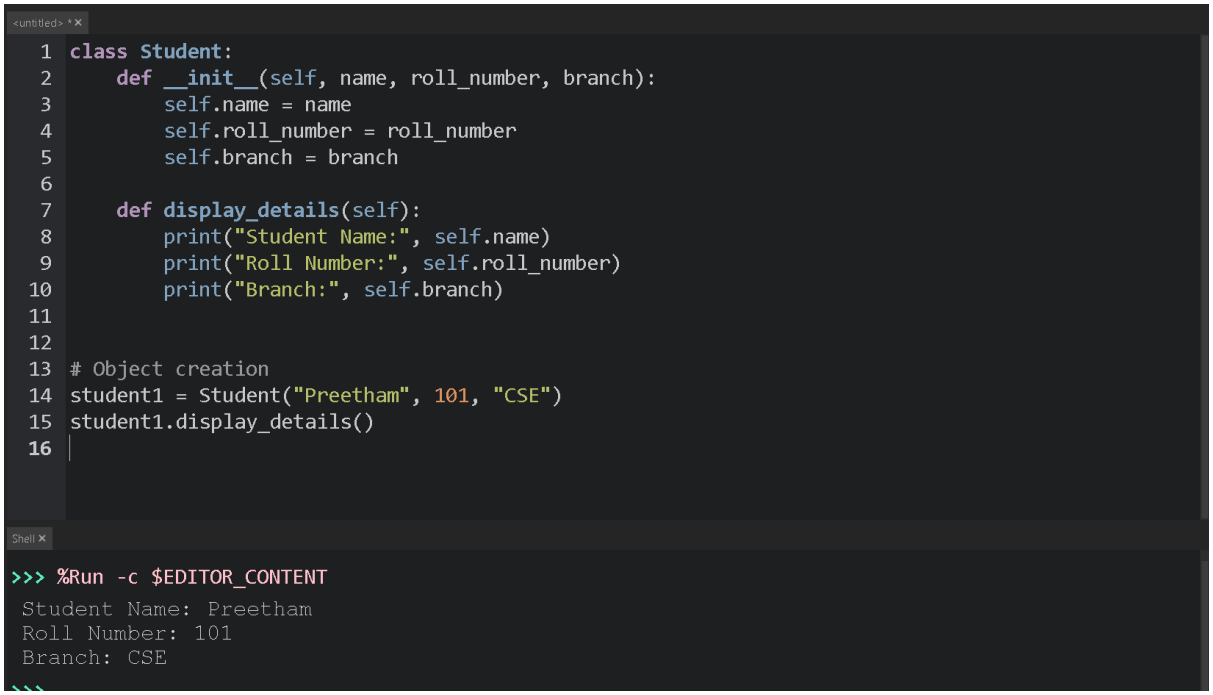
AI-Generated Python Code

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

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



# Object creation
student1 = Student("Preetham", 101, "CSE")
student1.display_details()
```



Output

Student Name: Preetham

Roll Number: 101

Branch: CSE

Analysis of AI-Generated Code

- The AI correctly created a class with a constructor (__init__).
- Attributes are clearly named and easy to understand.
- The display_details() method neatly prints student information.
- Code is readable, correct, and well-structured.

Conclusion: AI-generated code is accurate and suitable for beginner-level programs.

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

Scenario

Display the first 10 multiples of a given number.

Using a for Loop

```
def print_multiples(num):
    for i in range(1, 11):
        print(num * i)


print_multiples(5)
```

Output

```
5
10
15
20
25
30
35
40
45
50
```

Using a while Loop

```
def print_multiples_while(num):
    i = 1
    while i <= 10:
        print(num * i)
        i += 1

print_multiples_while(5)
```

Comparison & Analysis

Feature	for Loop	while Loop
Readability	High	Medium
Best Use	Fixed iterations	Condition-based
Complexity	Simple	Slightly more

Both approaches work correctly, but the for loop is more concise.

Task Description #3: Conditional Statements (Age Classification)

Scenario

Classify people based on age.

Using Nested 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(25))
```

Output

Adult

Alternative Approach (Simplified Conditions)

```
def classify_age_simple(age):
    categories = {
        range(0, 13): "Child",
        range(13, 20): "Teenager",
        range(20, 60): "Adult",
        range(60, 150): "Senior"
    }

    for age_range, label in categories.items():
        if age in age_range:
            return label
```

Explanation

- if-elif-else is easier for beginners.
- Dictionary-based logic is compact but slightly advanced.

- AI-generated conditions are logically correct and well-ordered.

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

Using a for Loop

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


print(sum_to_n(10))
```

Output

55

Using a while Loop

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

Using Mathematical Formula

```
def sum_to_n_formula(n):
    return n * (n + 1) // 2
```

Comparison

Method	Performance	Complexity
for loop	Good	Easy
while loop	Good	Medium
Formula	Best	Very Simple

AI correctly suggested multiple valid solutions.

Task Description #5: Classes (Bank Account Class)

Scenario

Design a basic banking application.

AI-Generated Bank Account Class

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

```
        self.account_holder = account_holder
        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)


# Object creation
account = BankAccount("Preetham", 1000)
account.deposit(500)
account.withdraw(300)
account.check_balance()
```

Output

```
Deposited: 500
```

Withdrawn: 300

Current Balance: 1200

Explanation

- Constructor initializes account holder and balance.
- deposit() increases balance.
- withdraw() checks balance before deducting.
- check_balance() displays current balance.
- AI-generated logic is safe, clear, and realistic.

Overall Conclusion

- AI tools effectively generate Python code for classes, loops, and conditionals.
- Generated code is correct, readable, and efficient.
- Human analysis is still required to ensure clarity, edge-case handling, and optimization.