

AI Assisted Coding

Week3 – Wednesday

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

Week 3 – Wednesday

Task Description #1: Classes (Student Class) 1) Prompt to be given (Humanized – VS Code / AI Tool)

Complete a Python Student class with attributes name, roll number, and branch. Include a constructor and a method display_details() that prints student information.

2) 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("Name:", self.name)  
        print("Roll Number:", self.roll_number)  
        print("Branch:", self.branch)  
  
# Object creation
```

```
student1 = Student("Anita Rao", 101, "CSE")
student1.display_details()
```

3) Output

Name: Anita Rao

Roll Number: 101

Branch: CSE

4) Remarks

- AI correctly generated a class with constructor and method.
 - Code is readable and logically structured.
 - Uses proper object-oriented principles.
 - Suitable for beginner-level student management systems.
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Task Description #2: Loops (Multiples of a Number) A) Using for Loop 1) Prompt to be given (Humanized)

Write a Python function that prints the first 10 multiples of a given number using a for loop.

2) Code

```
def print_multiples_for(num):
    for i in range(1, 11):
        print(num * i)
print_multiples_for(5)
```

3) Output

5

10

15

20

25

30

35

40

45

50

B) Using while Loop 1) Prompt to be given (Humanized)

Generate the same program to print the first 10 multiples of a number, but use a while loop instead of a for loop.

2) Code

```
def print_multiples_while(num):  
    i = 1  
    while i <= 10:  
        print(num * i)  
        i += 1  
print_multiples_while(5)
```

4) Remarks

- Both loops produce correct output.
 - for loop is shorter and more readable.
 - while loop provides more control but requires manual increment.
 - AI-generated logic is correct in both cases.
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Task Description #3: Conditional Statements (Age Classification) A) Nested if-elif-else Approach 1) Prompt to be given (Humanized)

Generate a Python function using if-elif-else statements to classify age as child, teenager, adult, or senior.

2) Code def

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

B) Alternative (Dictionary-Based Logic) 1) Prompt to be given (Humanized)

Generate an alternative age classification approach using simplified logic or dictionary-based conditions.

2) Code def

```
classify_age_alt(age):  
    if age < 0:  
        return "Invalid Age"  
  
    categories = {  
        "Child": age < 13,  
        "Teenager": 13 <= age < 20,  
        "Adult": 20 <= age < 60,
```

```
"Senior": age >= 60
```

```
}
```

```
for category, condition in categories.items():
```

```
if condition:
```

```
    return category
```

3) Output

Input: 10 → Child

Input: 17 → Teenager

Input: 35 → Adult

Input: 65 → Senior

4) Remarks

- Conditions are clear and logically correct.
 - if-elif-else is simpler for beginners.
 - Dictionary approach improves scalability.
 - AI-generated alternatives are efficient.
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Task Description #4: For and While Loops (Sum of First n Numbers) A) Using for Loop 1) Prompt to be given (Humanized)

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

2) Code

```
def sum_to_n_for(n):
```

```
    total = 0    for i in
```

```
        range(1, n + 1):
```

```
total += i  
return total
```

B) Using while Loop 1) Prompt to be given (Humanized)

Generate an alternative implementation using a while loop or a mathematical formula.

2) Code

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

3) Output

Input: 10

For Loop Output: 55

While Loop Output: 55

4) Remarks

- Both implementations are correct.
 - Mathematical formula would be most efficient.
 - Loop-based solutions are easier to understand.
 - AI suggestions are logically sound.
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**Task Description #5: Classes (Bank Account Class) 1) Prompt to be given
(Humanized – VS Code)**

Generate a Python Bank Account class with methods deposit(), withdraw(), and check_balance(). Include comments explaining the working of each method.

2) Code

```
class BankAccount:

    def __init__(self, account_holder, balance=0):
        # Initialize account holder name and balance
        self.account_holder = account_holder
        self.balance = balance

    def deposit(self, amount):
        # Add money to the account
        if amount > 0:
            self.balance += amount
            print("Deposited:", amount)
        else:
            print("Invalid deposit amount")

    def withdraw(self, amount):
        # Withdraw money if sufficient balance is available
        if amount <= self.balance:
            self.balance -= amount
            print("Withdrawn:", amount)
        else:
            print("Insufficient balance")
```

```
def check_balance(self):      # Display  
    current_balance     print("Current  
Balance:", self.balance)  
  
# Demonstration account = BankAccount("Rahul  
Kumar", 1000) account.deposit(500)  
account.withdraw(300)  
account.check_balance()
```

3) Output

Deposited: 500

Withdrawn: 300

Current Balance: 1200

4) Remarks

- AI-generated class structure is clear and functional.
 - Methods follow correct banking logic.
 - Comments improve transparency and understanding.
 - Suitable for basic banking applications.
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Overall Lab Conclusion

- AI-assisted code completion effectively generates classes, loops, and conditionals.
 - Generated code is readable, correct, and efficient.
 - Human review is necessary to verify edge cases and logic.
 - AI tools significantly speed up development and learning.
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