

## LAB ASSIGNMENT- 4.4

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Course Code: 24CS002PC215

Course Title: AI Assisted Coding

Lab Number: 4.4

BRANCH: cse

Task 1: Auto-Complete a Python Class for Bank Account

Prompt: Write a class definition comment and start the constructor for a class called BankAccount with account\_holder and balance attributes. Use GitHub Copilot to auto-complete the rest of the class, including methods to deposit, withdraw, and display balance.

Python Code:

```
class BankAccount:
```

```
    """A simple Bank Account class with deposit, withdraw, and display balance methods."""
```

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

```
        self.account_holder = account_holder
```

```
        self.balance = balance
```

```
    def deposit(self, amount):
```

```
        self.balance += amount
```

```
        return f"Deposited {amount}. New Balance = {self.balance}"
```

```
    def withdraw(self, amount):
```

```
        if amount > self.balance:
```

```
            return "Insufficient funds"
```

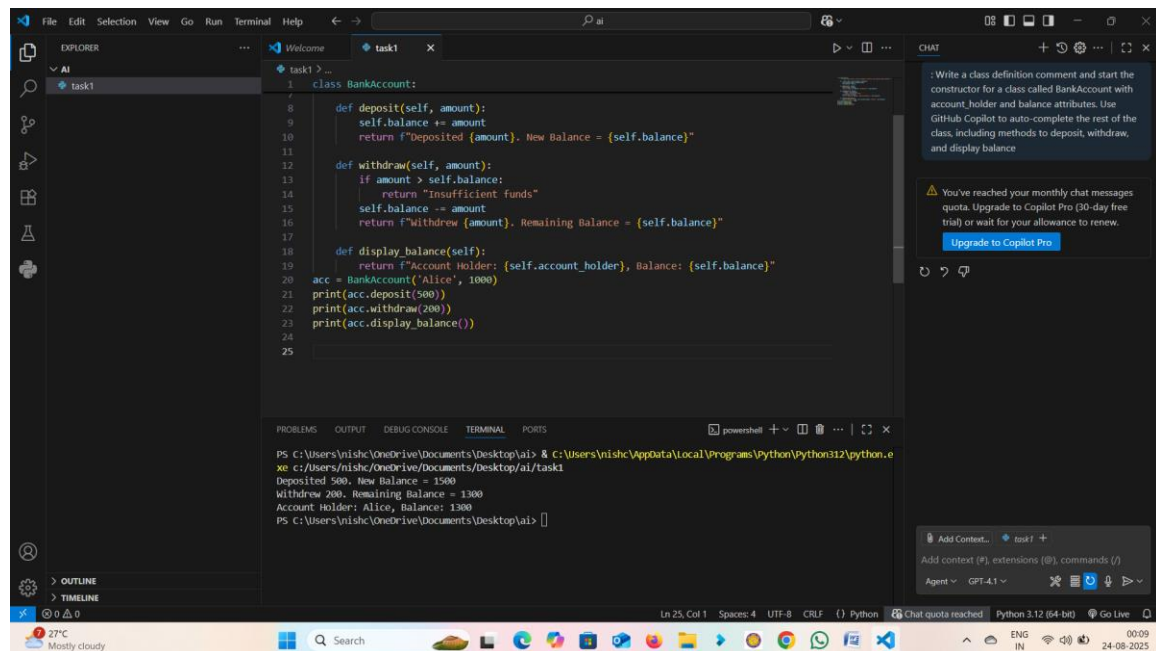
```
        self.balance -= amount
```

```
        return f"Withdrew {amount}. Remaining Balance = {self.balance}"
```

```
    def display_balance(self):
```

```
        return f"Account Holder: {self.account_holder}, Balance: {self.balance}"
```

Explanation: The class has attributes for account holder and balance. Methods allow deposit, withdrawal with balance check, and displaying account details.



Sample Output:

```
>>> acc = BankAccount('Alice', 1000)
>>> print(acc.deposit(500))
Deposited 500. New Balance = 1500
>>> print(acc.withdraw(200))
Withdraw 200. Remaining Balance = 1300
>>> print(acc.display_balance())
Account Holder: Alice, Balance: 1300
```

Observation: The BankAccount class successfully handled deposits, withdrawals, and displayed balance accurately.

Task 2: Auto-Complete a For Loop to Sum Even Numbers in a List

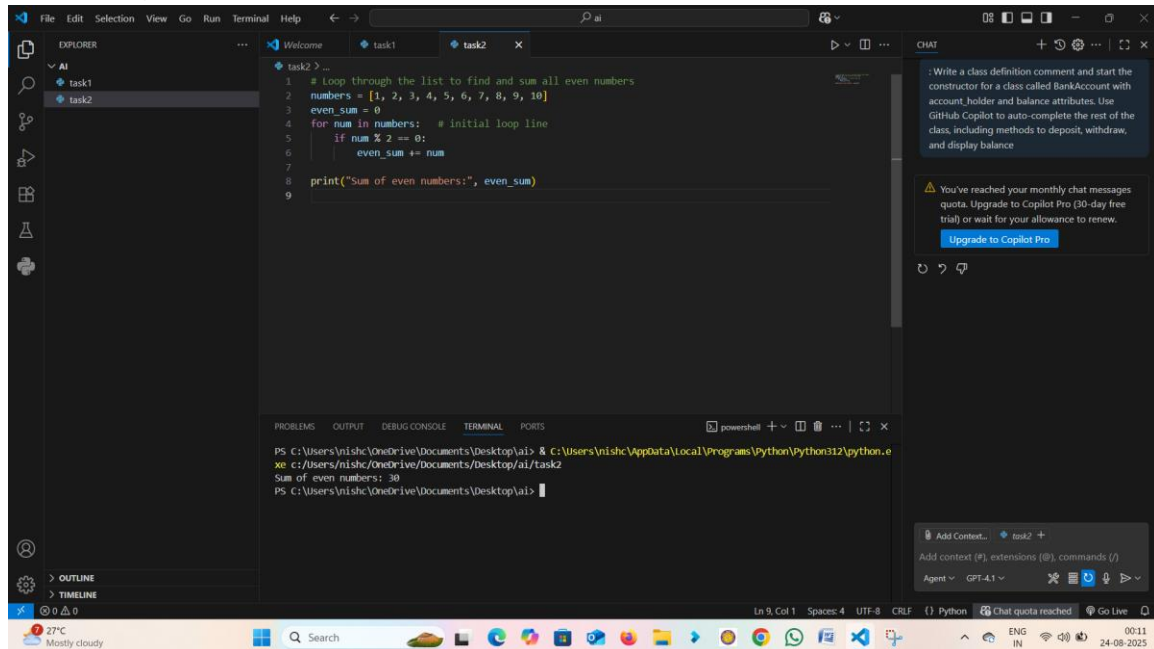
Prompt: Write a comment and the initial line of a loop to iterate over a list. Allow GitHub Copilot to complete the logic to sum all even numbers in the list.

Python Code:

```
numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
even_sum = 0
for num in numbers:
    if num % 2 == 0:
        even_sum += num
```

```
print("Sum of even numbers:", even_sum)
```

Explanation: The loop iterates through the list, checks if each number is even, and adds it to the running sum.



The screenshot shows a Visual Studio Code editor with a Python file named 'task2.py'. The code defines a list of numbers [1, 2, 3, 4, 5, 6, 7, 8, 9, 10], initializes a variable 'even\_sum' to 0, and uses a for loop to iterate through the list. Inside the loop, it checks if a number is even (num % 2 == 0) and adds it to 'even\_sum'. Finally, it prints the sum of even numbers. The terminal at the bottom shows the command to run the script and the output: 'Sum of even numbers: 30'. The right sidebar shows a chat window with a message from GitHub Copilot and a notification about reaching the monthly chat messages quota.

```
1 # Loop through the list to find and sum all even numbers
2 numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
3 even_sum = 0
4 for num in numbers: # Initial loop line
5     if num % 2 == 0:
6         even_sum += num
7
8 print("Sum of even numbers:", even_sum)
9
```

```
PS C:\Users\nishc\OneDrive\Documents\Desktop\ai> & c:\Users\nishc\AppData\Local\Programs\Python\Python312\python.exe c:\Users\nishc\OneDrive\Documents\Desktop\ai\task2
Sum of even numbers: 30
PS C:\Users\nishc\OneDrive\Documents\Desktop\ai>
```

Sample Output:

Sum of even numbers: 30

Observation: The loop correctly iterated and summed even numbers from the list.

### Task 3: Auto-Complete Conditional Logic to Check Age Group

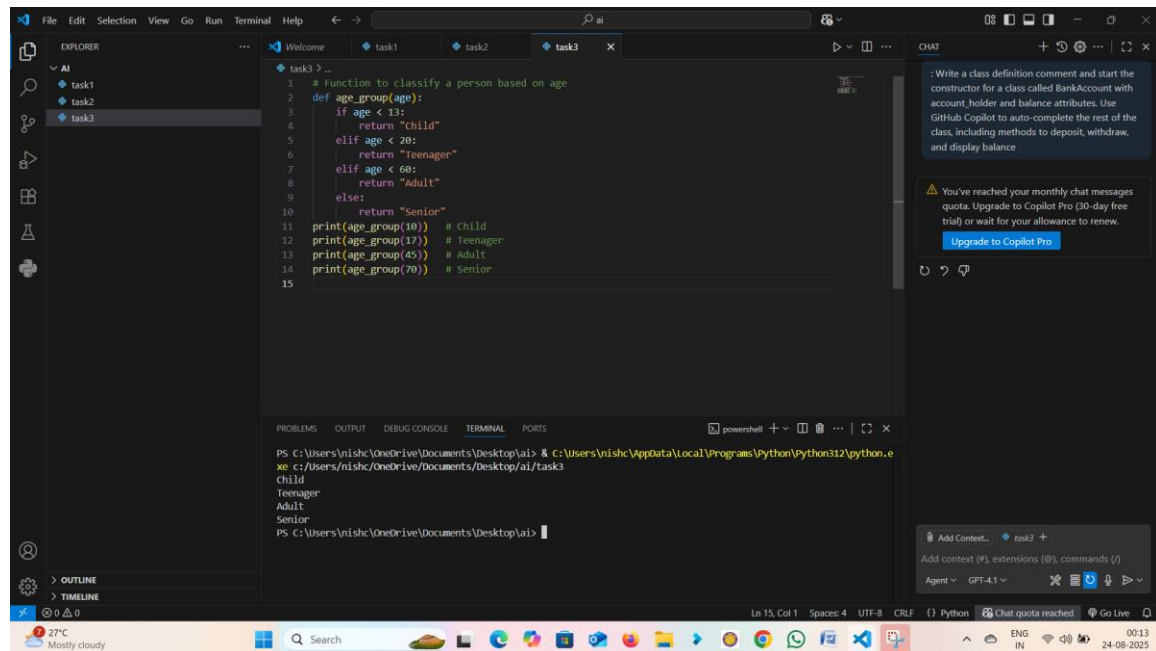
Prompt: Start a function that takes age as input and returns whether the person is a child, teenager, adult, or senior using if-elif-else.

Python Code:

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

```
return "Senior"
```

Explanation: The function uses if-elif-else conditionals to classify age groups.



The screenshot shows a Visual Studio Code editor with a Python file named 'task3.py'. The code defines a function 'age\_group' that uses if-elif-else conditionals to classify ages into 'Child', 'Teenager', 'Adult', or 'Senior'. Below the function definition, there are four print statements testing the function with ages 10, 17, 45, and 70. The terminal at the bottom shows the output of these tests: 'Child', 'Teenager', 'Adult', and 'Senior'. The right sidebar shows the 'CHAT' panel with a message from GitHub Copilot suggesting to write a class definition for 'BankAccount'.

```
1 # Function to classify a person based on age
2 def age_group(age):
3     if age < 13:
4         return "Child"
5     elif age < 20:
6         return "Teenager"
7     elif age < 60:
8         return "Adult"
9     else:
10        return "Senior"
11 print(age_group(10)) # Child
12 print(age_group(17)) # Teenager
13 print(age_group(45)) # Adult
14 print(age_group(70)) # Senior
15
```

```
PS C:\Users\nishc\OneDrive\Documents\Desktop\ai> & C:\Users\nishc\AppData\Local\Programs\Python\Python312\python.exe c:\Users\nishc\OneDrive\Documents\Desktop\ai\task3
Child
Teenager
Adult
Senior
PS C:\Users\nishc\OneDrive\Documents\Desktop\ai>
```

Sample Output:

```
>>> age_group(10) -> Child
>>> age_group(17) -> Teenager
>>> age_group(45) -> Adult
>>> age_group(70) -> Senior
```

Observation: The function correctly classified age groups based on input values.

Task 4: Auto-Complete a While Loop to Reverse Digits of a Number

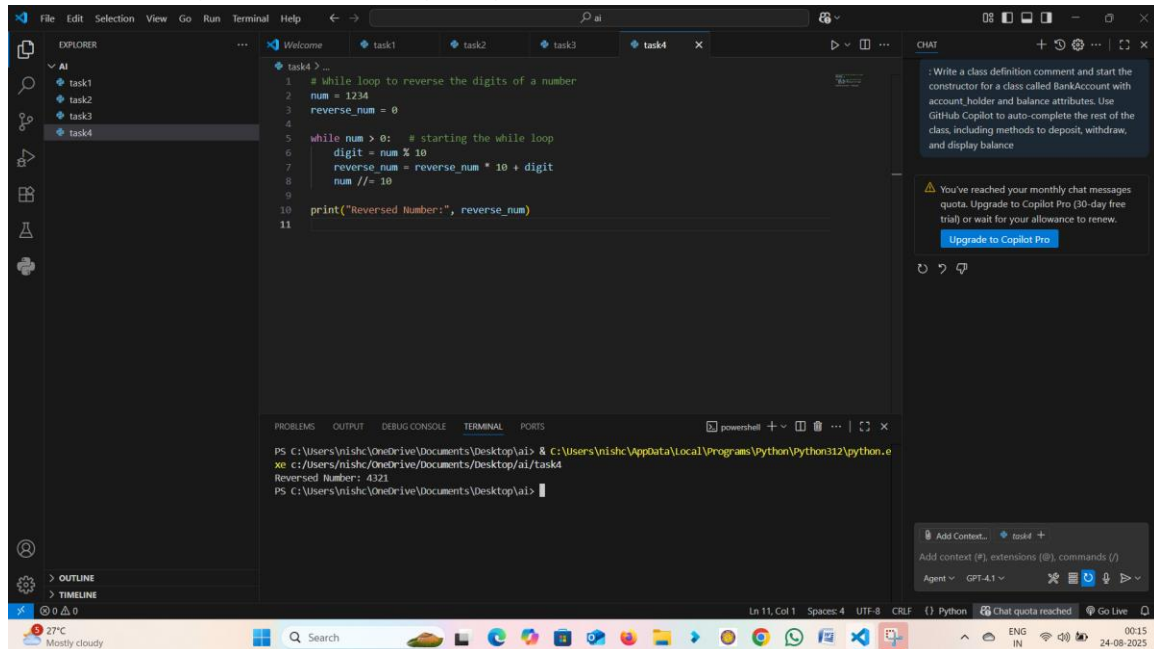
Prompt: Write a comment and start a while loop to reverse the digits of a number.

Python Code:

```
num = 1234
reverse_num = 0
while num > 0:
    digit = num % 10
    reverse_num = reverse_num * 10 + digit
    num //= 10
```

```
print("Reversed Number:", reverse_num)
```

Explanation: The loop extracts the last digit using modulo, builds the reversed number, and reduces the original number using integer division.



```
1 # while loop to reverse the digits of a number
2 num = 1234
3 reverse_num = 0
4
5 while num > 0: # starting the while loop
6     digit = num % 10
7     reverse_num = reverse_num * 10 + digit
8     num //= 10
9
10 print("Reversed Number:", reverse_num)
11
```

PS C:\Users\nishc\OneDrive\Documents\Desktop\ai> & c:\Users\nishc\AppData\Local\Programs\Python\Python312\python.exe c:\Users\nishc\OneDrive\Documents\Desktop\ai\task4  
Reversed Number: 4321  
PS C:\Users\nishc\OneDrive\Documents\Desktop\ai>

Sample Output:

Reversed Number: 4321

Observation: The while loop reversed the digits of the number without errors.

### Task 5: Auto-Complete Class with Inheritance (Employee → Manager)

Prompt: Begin a class Employee with attributes name and salary. Then, start a derived class Manager that inherits from Employee and adds a department.

Python Code:

class Employee:

```
    def __init__(self, name, salary):
        self.name = name
        self.salary = salary
```

```
    def display(self):
        return f"Name: {self.name}, Salary: {self.salary}"
```

```

class Manager(Employee):
    def __init__(self, name, salary, department):
        super().__init__(name, salary)
        self.department = department

    def display(self):
        return f"Name: {self.name}, Salary: {self.salary}, Dept: {self.department}"

```

Explanation: The Manager class inherits from Employee using super() for constructor chaining and overrides the display method.

The screenshot shows a VS Code editor with a Python file containing the following code:

```

class Employee:
    def __init__(self, name, salary):
        self.name = name
        self.salary = salary

    def display(self):
        return f"Name: {self.name}, Salary: {self.salary}"

# Derived class Manager inheriting from Employee and adding department
class Manager(Employee):
    def __init__(self, name, salary, department):
        super().__init__(name, salary)
        self.department = department

    def display(self):
        return f"Name: {self.name}, Salary: {self.salary}, Dept: {self.department}"

mgr = Manager("John", 50000, "IT")
print(mgr.display())

```

The terminal at the bottom shows the execution output:

```

PS C:\Users\nishc\OneDrive\Documents\Desktop\ai> & C:\Users\nishc\AppData\Local\Programs\Python\Python312\python.exe C:\Users\nishc\OneDrive\Documents\Desktop\ai\task5
PS C:\Users\nishc\OneDrive\Documents\Desktop\ai> & C:\Users\nishc\AppData\Local\Programs\Python\Python312\python.exe C:\Users\nishc\OneDrive\Documents\Desktop\ai\task5
Name: John, Salary: 50000, Dept: IT
PS C:\Users\nishc\OneDrive\Documents\Desktop\ai>

```

The chat window on the right shows a suggestion from GitHub Copilot: "Write a class definition comment and start the constructor for a class called BankAccount with account\_holder and balance attributes. Use GitHub Copilot to auto-complete the rest of the class, including methods to deposit, withdraw, and display balance".

Sample Output:

Name: John, Salary: 50000, Dept: IT

Observation: The Manager class inherited Employee attributes and methods correctly while extending functionality.

Observation

In this lab, we explored GitHub Copilot's ability to auto-complete Python code for classes, loops, and conditionals. We practiced building classes with inheritance, loops for summing and reversing, and conditional logic for classification. This enhanced understanding of AI-assisted coding and Python fundamentals.