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:

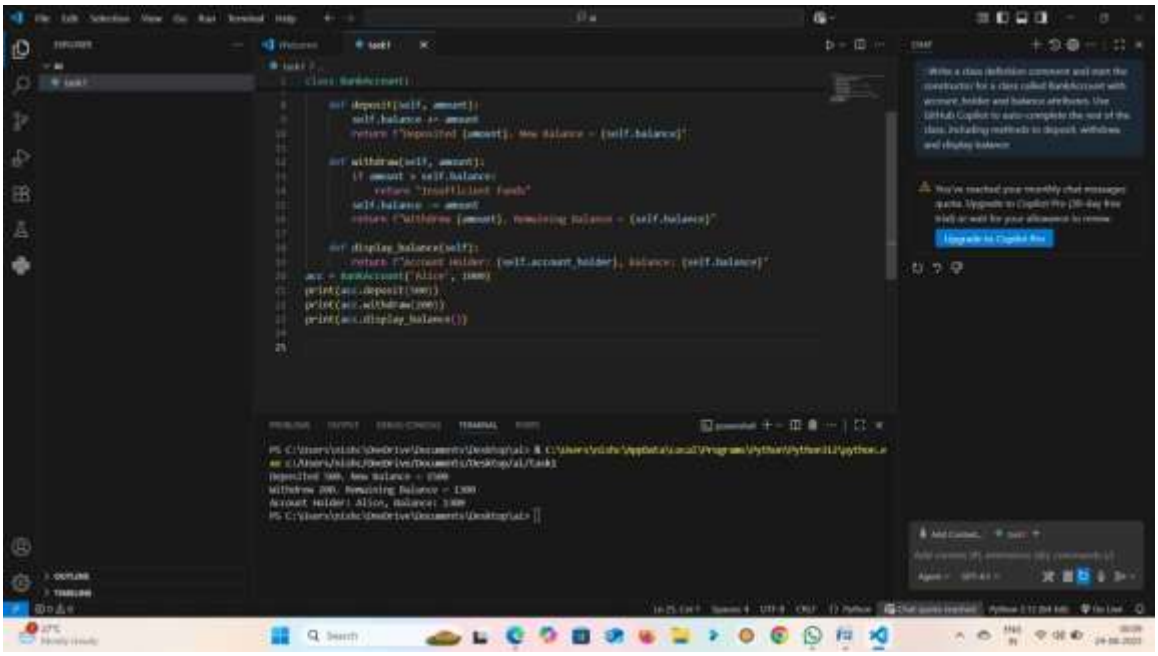
```
class BankAccount:
    """A simple Bank Account class with deposit, withdraw, and display balance methods."""
    def __init__(self, account_holder, balance=0):
        self.account_holder = account_holder
        self.balance = balance

    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))
Withdrew 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

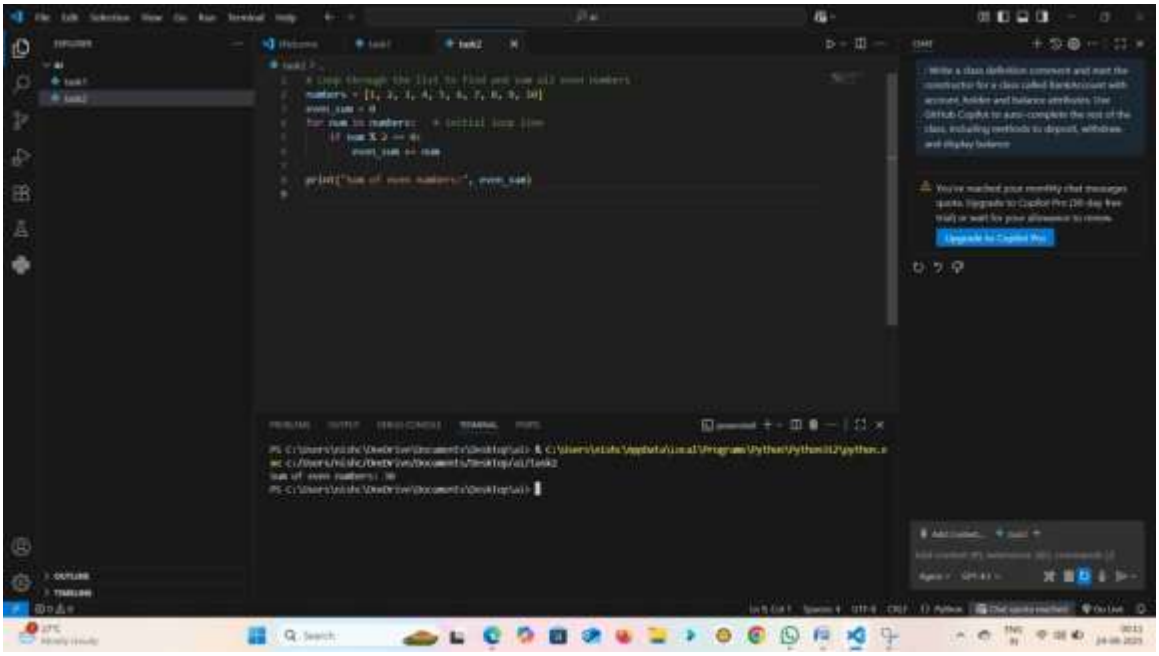
Prompt: Write a comment and the initial line of a loop to iterate over a list. Allow GitHub Copilot to complete the logic to sum all even numbers in the list.

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.



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

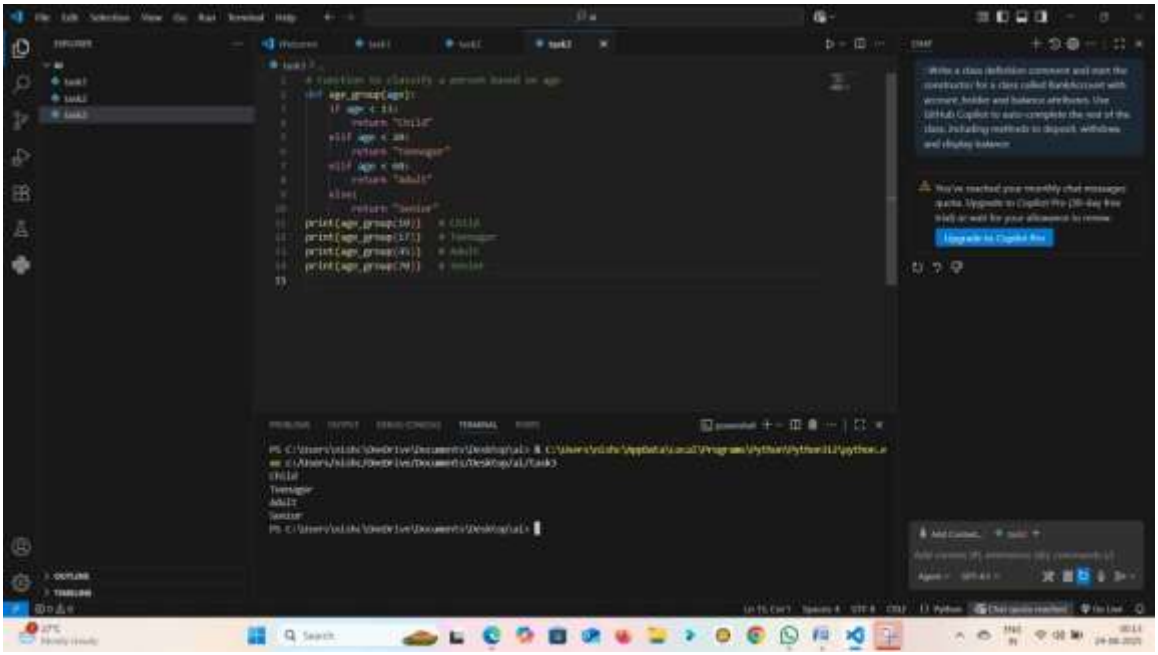
Prompt: Start a function that takes age as input and returns whether the person is a child, teenager, adult, or senior using if-elif-else.

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.



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

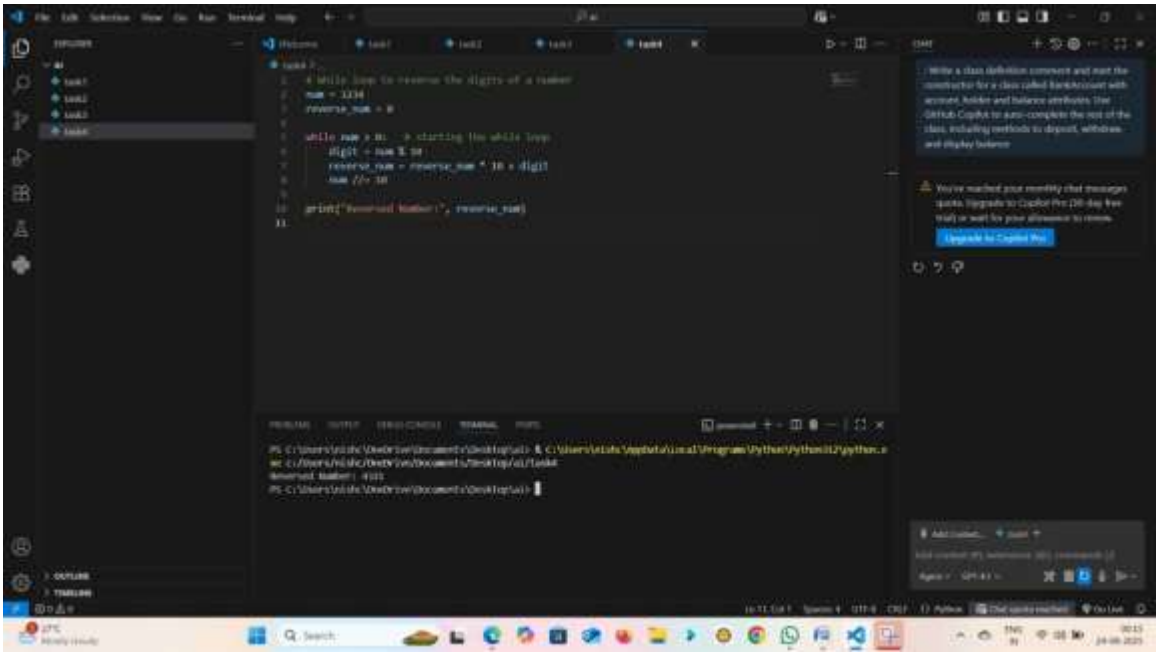
Prompt: Write a comment and start a while loop to reverse the digits of a number.

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.



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:

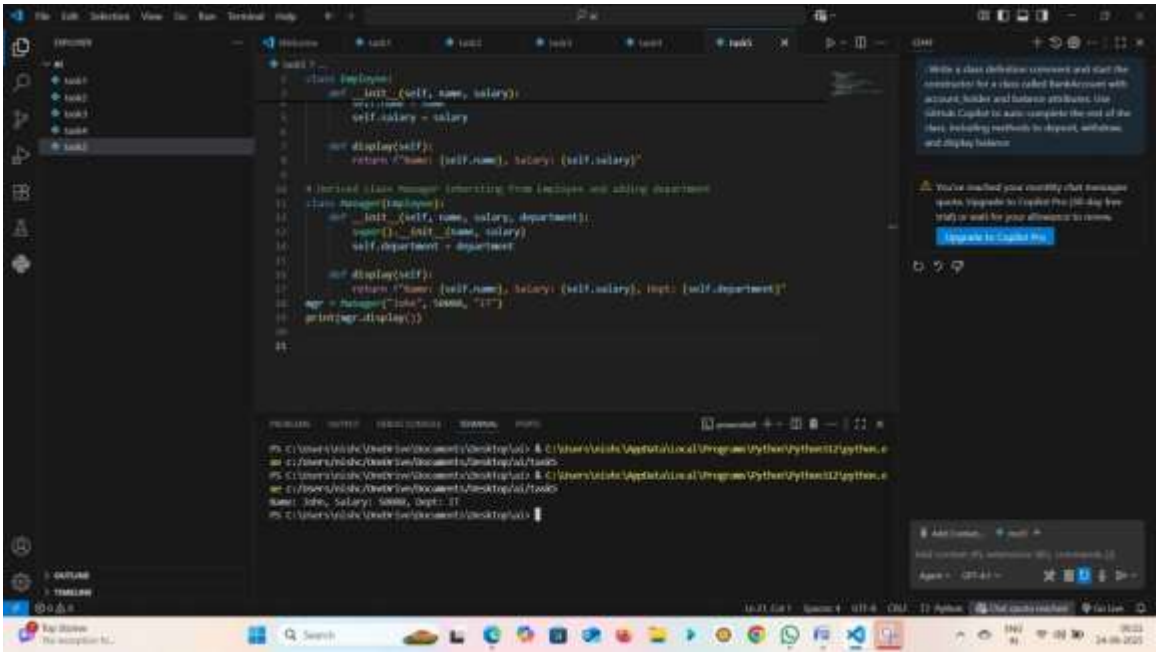
```
class Employee:
    def __init__(self, name, salary):
        self.name = name
        self.salary = salary

    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.



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.