AI Assisted Coding Lab ass-6.1

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Task Description #1 (AI-Based Code Completion for Loops)

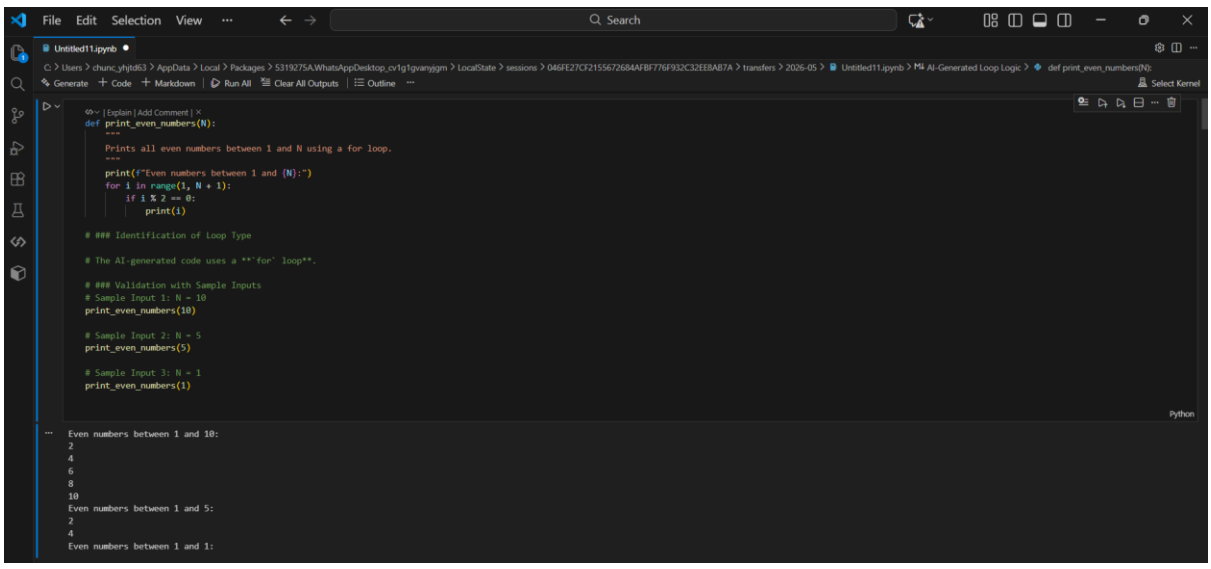
Task: Use an AI code completion tool to generate a loop-based program.

Prompt:

"Generate Python code to print all even numbers between 1 and N using a loop."

Expected Output:

- **AI-generated loop logic.**
- **Identification of loop type used (for or while).**
- **Validation with sample inputs.**

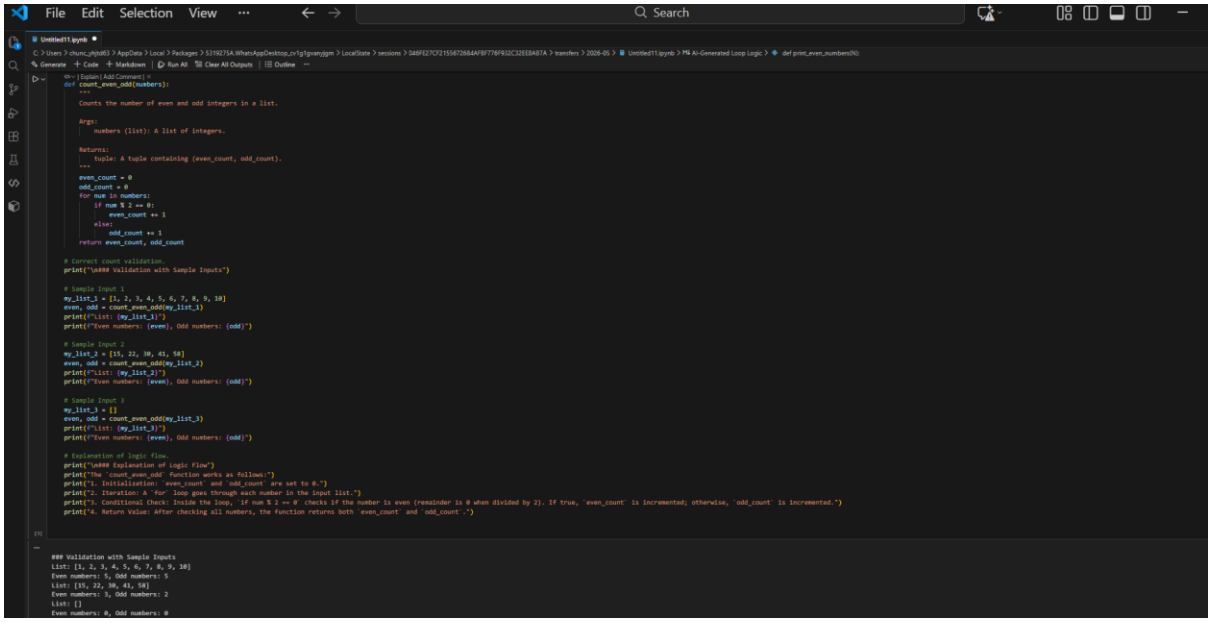


Task Description #2 (AI-Based Code Completion for Loop with Conditionals)

Task: Use an AI code completion tool to combine loops and conditionals.

Prompt:

“Generate Python code to count how many numbers in a list are even and odd.”



Expected Output:

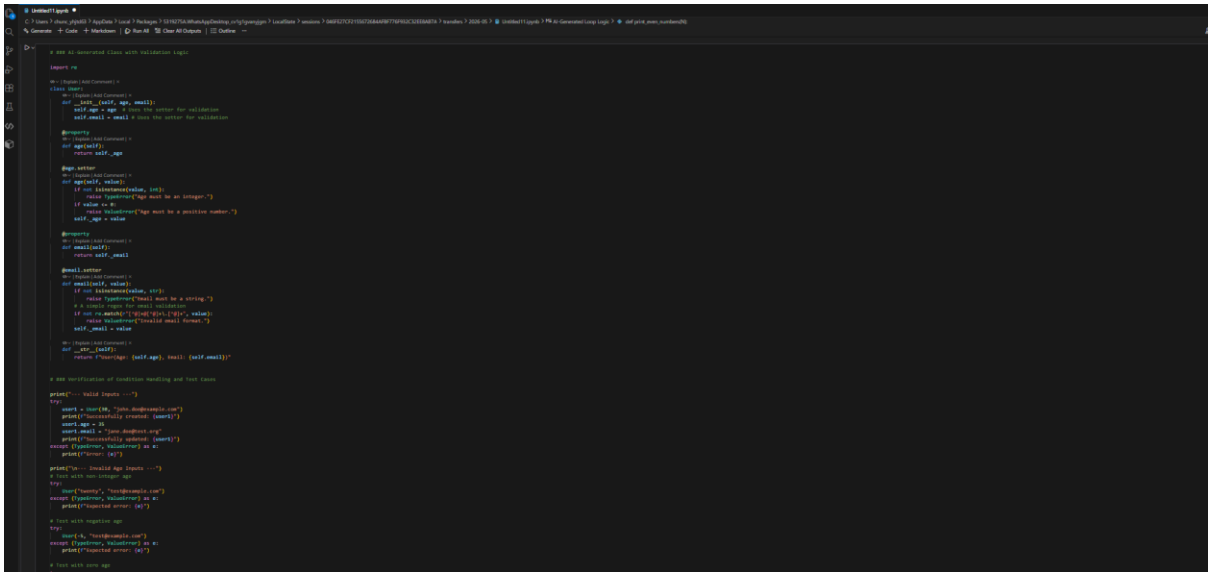
- AI-generated code using loop and if condition.
- Correct count validation.
- Explanation of logic flow.

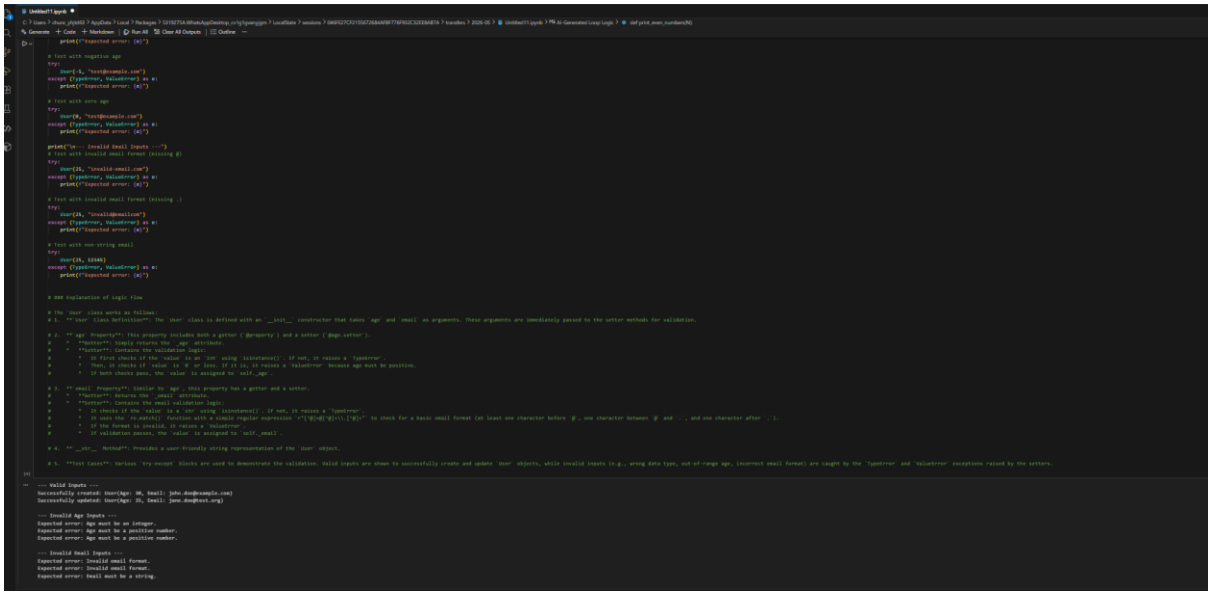
Task Description #3 (AI-Based Code Completion for Class Attributes Validation)

Task: Use an AI tool to complete a Python class that validates user input.

Prompt:

“Generate a Python class User that validates age and email using conditional statements.”





Expected Output:

• AI-generated class with validation logic.

• Verification of condition handling.

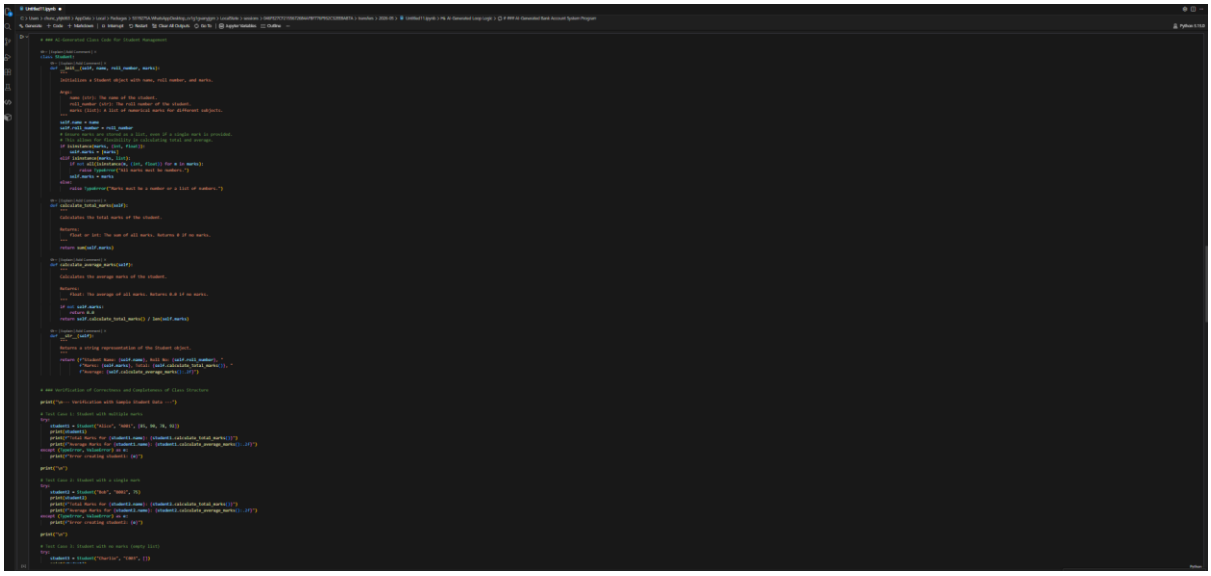
• Test cases for valid and invalid inputs.

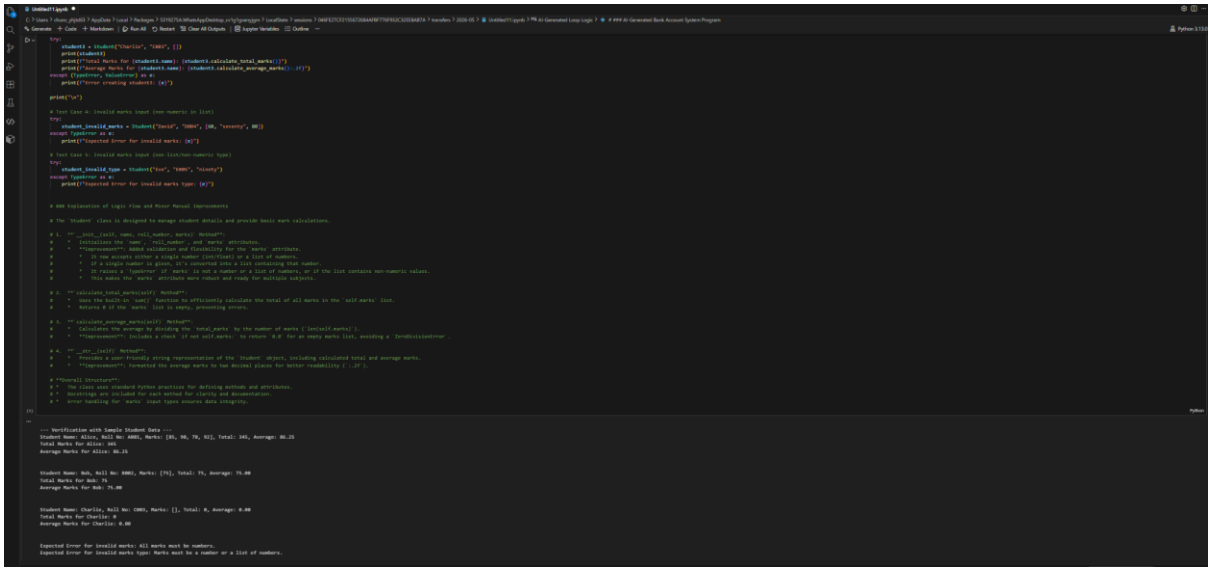
Task Description #4 (AI-Based Code Completion for Classes)

Task: Use an AI code completion tool to generate a Python class for managing student details.

Prompt:

“Generate a Python class Student with attributes (name, roll number, marks) and methods to calculate total and average marks.”





Expected Output:

• AI-generated class code.

• Verification of correctness and completeness of class structure.

• Minor manual improvements (if needed) with justification.

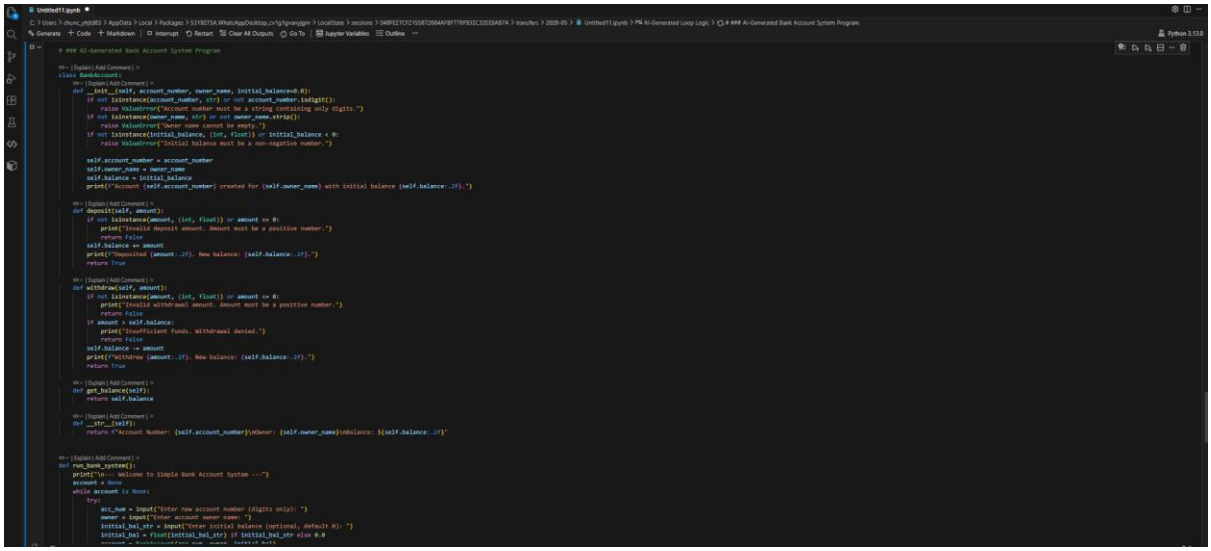
Task Description 5 (AI-Assisted Code Completion Review)

Task: Use an AI tool to generate a complete Python program using classes, loops, and conditionals together.

Prompt:

“Generate a Python program for a simple bank account system using

class, loops, and conditional statements.”



```
# ### AI-Generated Bank Account System Program

class BankAccount:
    def __init__(self, account_number, owner_name, initial_balance=0.0):
        if not isinstance(account_number, str) or not account_number.isdigit():
            raise ValueError("Account number must be a string containing only digits.")
        if not isinstance(owner_name, str) or not owner_name.strip():
            raise ValueError("Owner name cannot be empty.")
        if not isinstance(initial_balance, (int, float)) or initial_balance < 0:
            raise ValueError("Initial balance must be a non-negative number.")

        self.account_number = account_number
        self.owner_name = owner_name
        self.balance = initial_balance
        print(f"Account {self.account_number} created for {self.owner_name} with initial balance {self.balance:.2f}.")

    def deposit(self, amount):
        if not isinstance(amount, (int, float)) or amount <= 0:
            print("Invalid deposit amount. Amount must be a positive number.")
            return False
        self.balance += amount
        print(f"Deposited {amount:.2f}. New balance: {self.balance:.2f}.")
        return True

    def withdraw(self, amount):
        if not isinstance(amount, (int, float)) or amount <= 0:
            print("Invalid withdrawal amount. Amount must be a positive number.")
            return False
        if amount > self.balance:
            print("Insufficient funds. Withdrawal denied.")
            return False
        self.balance -= amount
        print(f"Withdrew {amount:.2f}. New balance: {self.balance:.2f}.")
        return True

    def get_balance(self):
        return self.balance

    def __str__(self):
        return f"Account Number: {self.account_number}\nOwner: {self.owner_name}\nBalance: ${self.balance:.2f}"


def run_bank_system():
    print("\n--- Welcome to Simple Bank Account System ---")
    account = None
    while account is None:
        try:
            acc_num = input("Enter new account number (digits only): ")
            owner = input("Enter account owner name: ")
            initial_bal_str = input("Enter initial balance (optional, default 0): ")
            initial_bal = float(initial_bal_str) if initial_bal_str else 0.0
```

```
        except ValueError as e:
            print(f"Error creating account: {e}\nPlease try again.")
        except Exception as e:
            print(f"An unexpected error occurred: {e}\nPlease try again.")

    while True:
        print("\n--- Menu ---")
        print("1. Deposit")
        print("2. Withdraw")
        print("3. Check Balance")
        print("4. Account Details")
        print("5. Exit")

        choice = input("Enter your choice: ")

        if choice == '1':
            try:
                amount = float(input("Enter amount to deposit: "))
                account.deposit(amount)
            except ValueError:
                print("Invalid input. Please enter a numerical amount.")
        elif choice == '2':
            try:
                amount = float(input("Enter amount to withdraw: "))
                account.withdraw(amount)
            except ValueError:
                print("Invalid input. Please enter a numerical amount.")
        elif choice == '3':
            print(f"Current Balance: ${account.get_balance():.2f}")
        elif choice == '4':
            print(account)
        elif choice == '5':
            print("Thank you for using our bank system. Goodbye!")
            break
        else:
            print("Invalid choice. Please select a valid option (1-5).")

# Run the program
run_bank_system()



# ### Identification of Strengths and Limitations of AI Suggestions

# **Strengths:**
# 1.  **Rapid Prototyping**: The AI quickly generated a functional base for a bank account system, saving significant initial development time.
# 2.  **Correct Structure**: It correctly used a `class` to encapsulate account logic, `loops` for interactive menus, and `conditionals` for transaction validation and menu navigation.
# 3.  **Basic Validation**: The generated code included basic input validation (e.g., positive deposit/withdrawal amounts, sufficient balance, non-empty owner name, digit-only account number) which is crucial for robust applications.
# 4.  **Clear Method Separation**: Methods like `deposit`, `withdraw`, and `get_balance` are well-defined and follow good object-oriented principles.
# 5.  **Interactive Loop**: The `while True` loop for the menu provides a good user experience for interacting with the system.

# **Limitations:**
# 1.  **Limited Persistence**: The system lacks any form of data persistence (e.g., saving accounts to a file or database). All data is lost when the program ends.
# 2.  **Single Account Management**: The program only allows managing one account at a time. A real system would need to manage multiple accounts, perhaps using a list or dictionary of `BankAccount` objects.
# 3.  **Security**: No security measures (e.g., password, PIN) are implemented for transactions or account access.
# 4.  **Error Handling Sophistication**: While basic validation is present, more robust error handling (e.g., specific error codes, custom exceptions for different types of failures) could be implemented.
# 5.  **User Experience (UX) Enhancements**: The text-based interface is functional but basic. A more user-friendly interface might involve clearing the screen or providing more detailed feedback.
# 6.  **Edge Cases**: While some validation is present, more comprehensive checks for edge cases (e.g., very large numbers, specific formatting requirements for account numbers) could be added.
```

```
--- Welcome to Simple Bank Account System ---
Enter new account number (digits only): 6757
Enter account owner name: gg
Enter initial balance (optional, default 0):
Account 6757 created for gg with initial balance 0.00.

--- Menu ---
1. Deposit
2. Withdraw
3. Check Balance
4. Account Details
5. Exit
Enter your choice: 1
Enter amount to deposit: 6666
Deposited 6666.00. New balance: 6666.00.

--- Menu ---
1. Deposit
2. Withdraw
3. Check Balance
4. Account Details
5. Exit
Enter your choice: 3
Current Balance: $6666.00

--- Menu ---
1. Deposit
2. Withdraw
3. Check Balance
4. Account Details
5. Exit
Enter your choice: 5
Thank you for using our bank system. Goodbye!
```

Expected Output:

- Complete AI-generated program.
- Identification of strengths and limitations of AI suggestions.
- Reflection on how AI assisted coding productivity.