ASSIGNMENT-6

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Batch-28

Task-1:

Task Description #1 (AI-Based Code Completion for Loops)
Task: Use an AI code completion tool to generate a loop-based program.

Prompt:

Write a Python program that uses a loop to print all even numbers between 1 and a user-defined integer N (inclusive). The program should clearly demonstrate the loop logic, specify whether a for loop or a while loop is used, and include a sample execution showing the output for a given value of N.

Code and Output:

```
1  def print_even_numbers(N):
2      for i in range(1, N + 1):
3          if i % 2 == 0:
4              print(i)
5  print_even_numbers(10)
6
```

```
Shell
>>> %Run -c $EDITOR_CONTENT
2
4
6
8
10
>>>
```

Identification of loop type used (for or while).

- **Loop used: for loop**
- **A for loop is ideal when the range (1 to N) is known in advance**

Explanation:

- An AI code completion tool is used to generate Python code that prints even numbers from **1 to N**.
- A **loop (`for` or `while`)** iterates through numbers in the given range.
- A **conditional check (`number % 2 == 0`)** identifies even numbers.
- The program is validated using sample input values to ensure correct output.
- This task demonstrates how AI helps quickly generate correct loop logic with minimal effort.

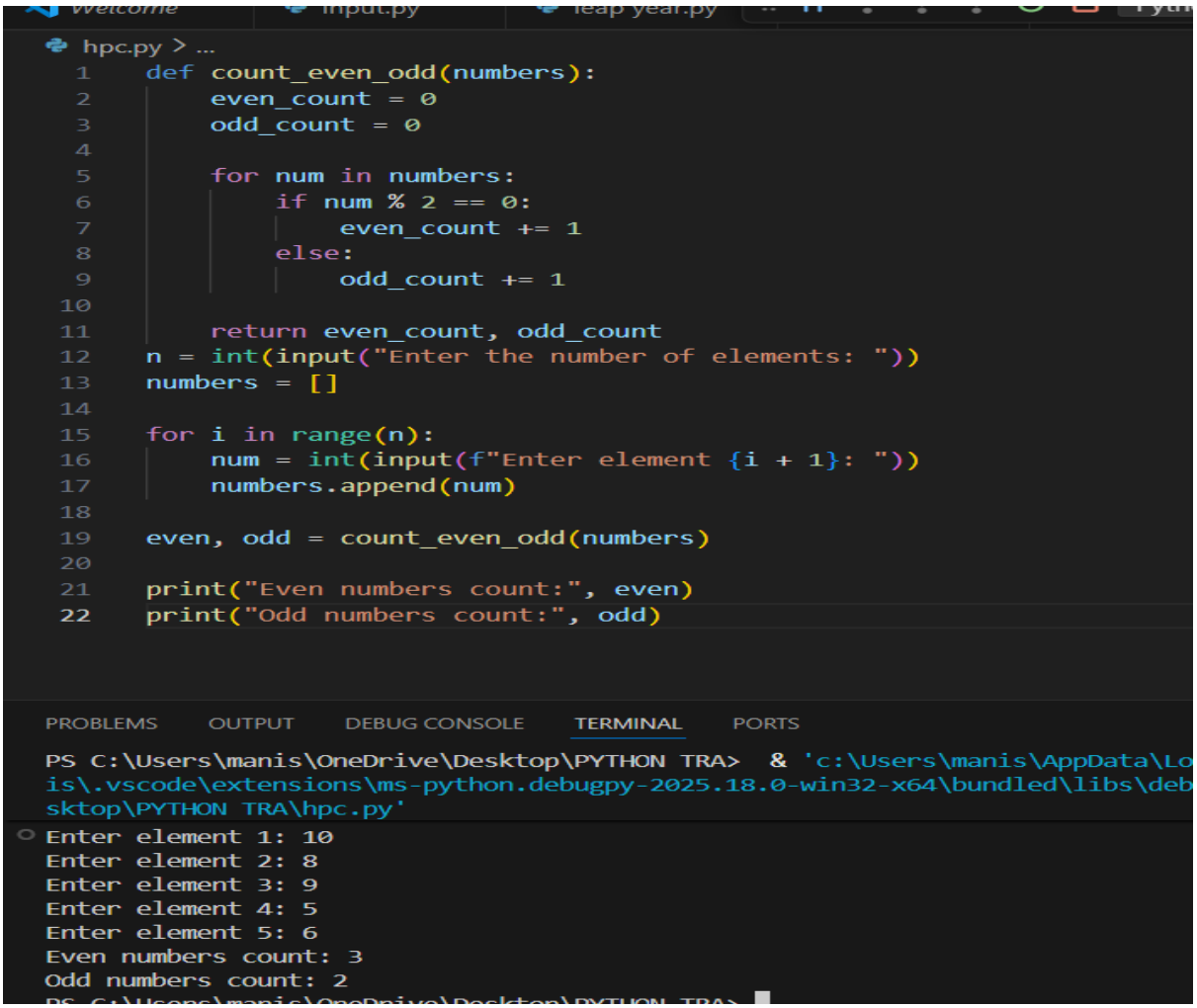
Task-2:

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 that uses a loop and `if-else` conditionals to count the number of even and odd elements in a given list. Include sample input, output, and a brief explanation of the logic."

Code and Output:



```python
def count_even_odd(numbers):
    even_count = 0
    odd_count = 0

    for num in numbers:
        if num % 2 == 0:
            even_count += 1
        else:
            odd_count += 1

    return even_count, odd_count
n = int(input("Enter the number of elements: "))
numbers = []

for i in range(n):
    num = int(input(f"Enter element {i + 1}: "))
    numbers.append(num)

even, odd = count_even_odd(numbers)

print("Even numbers count:", even)
print("Odd numbers count:", odd)
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS
PS C:\Users\manis\OneDrive\Desktop\PYTHON TRA>  & 'c:\Users\manis\AppData\Lo
is\.vscode\extensions\ms-python.debugpy-2025.18.0-win32-x64\bundled\libs\deb
sktop\PYTHON TRA\hpc.py'
Enter element 1: 10
Enter element 2: 8
Enter element 3: 9
Enter element 4: 5
Enter element 5: 6
Even numbers count: 3
Odd numbers count: 2
```

Explanation:

1. **The user enters how many elements the list will contain.**
2. **A for loop collects elements dynamically into a list.**
3. **Another for loop checks each number using an if–else condition.**
4. **Even and odd counters are updated accordingly.**
5. **Final counts are displayed.**

Loop and Conditional Used

Loop: `for` loop
Conditional: `if-else`

`TASK-3:`

Task Description #3 (AI-Based Code Completion for Class Attributes Validation)
Task: Use an AI tool to complete a Python class that validates the user input.
Expected Output:
• AI-generated class with validation logic.
• Verification of condition handling.
• Test cases for valid and invalid inputs.

Prompt:

"Create a Python class `User` that validates user age and email using conditional statements. Include validation logic and test cases for both valid and invalid inputs."

Code and Output:

```python
class User:
    def __init__(self, age, email):
        self.age = age
        self.email = email

    def validate_age(self):
        return self.age >= 18

    def validate_email(self):
        return "@" in self.email and "." in self.email

    def validate_user(self):
        return self.validate_age(), self.validate_email()

age = int(input("Enter age: "))
email = input("Enter email: ")

user = User(age, email)
age_valid, email_valid = user.validate_user()

print("\nValidation Results:")
print("Age valid:", age_valid)
print("Email valid:", email_valid)
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\manis\OneDrive\Desktop\PYTHON TRA>  & 'c:\Users\manis\AppData\Local
is\.vscode\extensions\ms-python.debugpy-2025.18.0-win32-x64\bundled\libs\debugp
sktop\PYTHON TRA\hpc.py'
Enter age: 18
Enter email: manishaboddu537@gmail.com

Validation Results:
Age valid: True
Email valid: True
PS C:\Users\manis\OneDrive\Desktop\PYTHON TRA>
```

Explanation:

1. **The User class stores age and email as attributes.**
2. **Separate methods validate age and email using conditional statements.**
3. **Test cases demonstrate correct handling of valid and invalid inputs.**

Task-4:

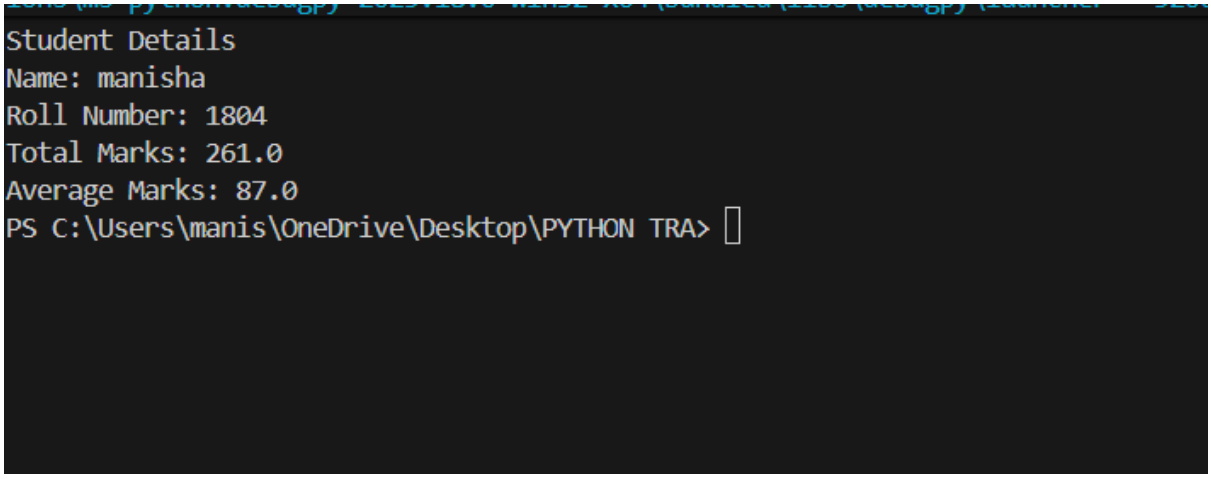
Task Description #4 (AI-Based Code Completion for Classes)
Task: Use an AI code completion tool to generate a Python class for managing student details.
Expected Output:
• AI-generated class code.
• Verification of correctness and completeness of class structure.
• Minor manual improvements (if needed) with justification.

Prompt:

"Create a Python class `Student` with attributes `name`, `roll_number`, and `marks`. Implement methods to calculate total marks and average marks, and include a short test example to verify correctness."

Code and Output:

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

    def calculate_total(self):
        return sum(self.marks)

    def calculate_average(self):
        if len(self.marks) == 0:
            return 0
        return self.calculate_total() / len(self.marks)
name = input("Enter student name: ")
roll_number = input("Enter roll number: ")

n = int(input("Enter number of subjects: "))
marks = []

for i in range(n):
    mark = float(input(f"Enter marks for subject {i + 1}: "))
    marks.append(mark)

student = Student(name, roll_number, marks)

print("\nStudent Details")
print("Name:", student.name)
print("Roll Number:", student.roll_number)
print("Total Marks:", student.calculate_total())
print("Average Marks:", student.calculate_average())
```



Explanation:

- **The Student class stores student name, roll number, and marks.**
- **User inputs details and marks dynamically using a loop.**
- **calculate_total() adds all marks.**
- **calculate_average() computes the average safely.**
- **The program displays total and average marks correctly.**

TASK-5:

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.

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

Prompt:

Prompt:

> *"Create a Python program for a simple bank account system using classes, loops, and conditional statements."*

Code and Output:

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

    def deposit(self, amount):
        if amount > 0:
            self.balance += amount
            print("Amount deposited successfully.")
        else:
            print("Invalid deposit amount.")

    def withdraw(self, amount):
        if amount <= self.balance and amount > 0:
            self.balance -= amount
            print("Withdrawal successful.")
        else:
            print("Insufficient balance or invalid amount.")

    def check_balance(self):
        print("Current Balance:", self.balance)
name = input("Enter account holder name: ")
account = BankAccount(name)

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

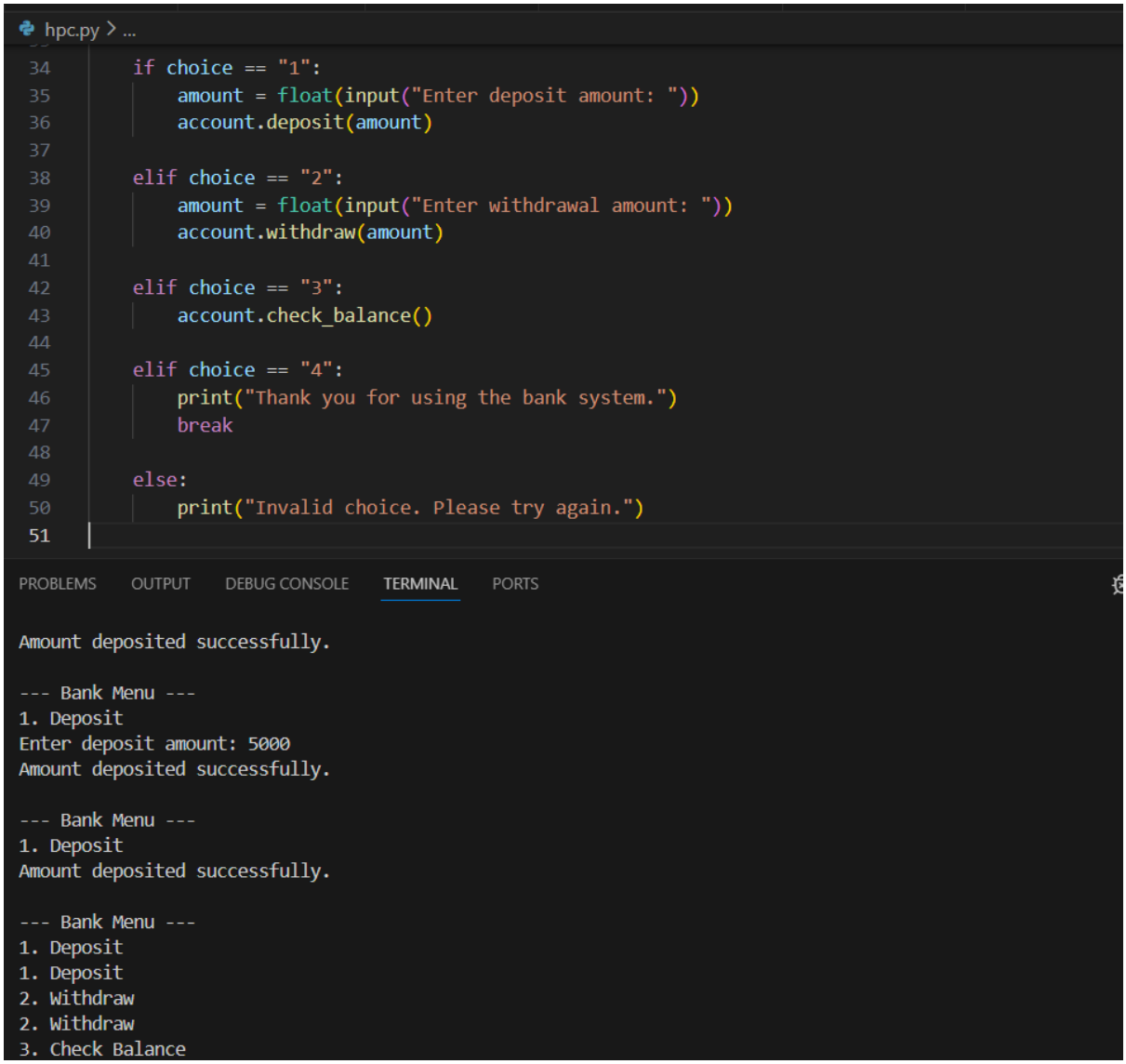
hpc.py > ...

```
    if choice == "1":
        amount = float(input("Enter deposit amount: "))
        account.deposit(amount)

    elif choice == "2":
        amount = float(input("Enter withdrawal amount: "))
        account.withdraw(amount)

    elif choice == "3":
        account.check_balance()

    elif choice == "4":
        print("Thank you for using the bank system.")
        break

    else:
        print("Invalid choice. Please try again.")

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
Amount deposited successfully.

--- Bank Menu ---
1. Deposit
Enter deposit amount: 5000
Amount deposited successfully.

--- Bank Menu ---
1. Deposit
Amount deposited successfully.

--- Bank Menu ---
1. Deposit
1. Deposit
2. Withdraw
2. Withdraw
3. Check Balance
```

```
Amount deposited successfully.

--- Bank Menu ---
1. Deposit
1. Deposit
2. Withdraw
2. Withdraw
3. Check Balance
4. Exit
Enter your choice: 4
Thank you for using the bank system.
PS C:\Users\manis\OneDrive\Desktop\PYTHON TRA>
```



Explanation:

- **The program uses a BankAccount class to store account details and balance.**
- **Conditional statements handle deposit, withdrawal, and validation.**
- **A loop creates a menu-driven system for repeated user actions.**
- **AI assistance helped quickly build the program structure and logic.**
- **Human review is needed to improve security and error handling.**