AI-Assisted Coding

Week-6.1

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Batch-28

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

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

Prompt:

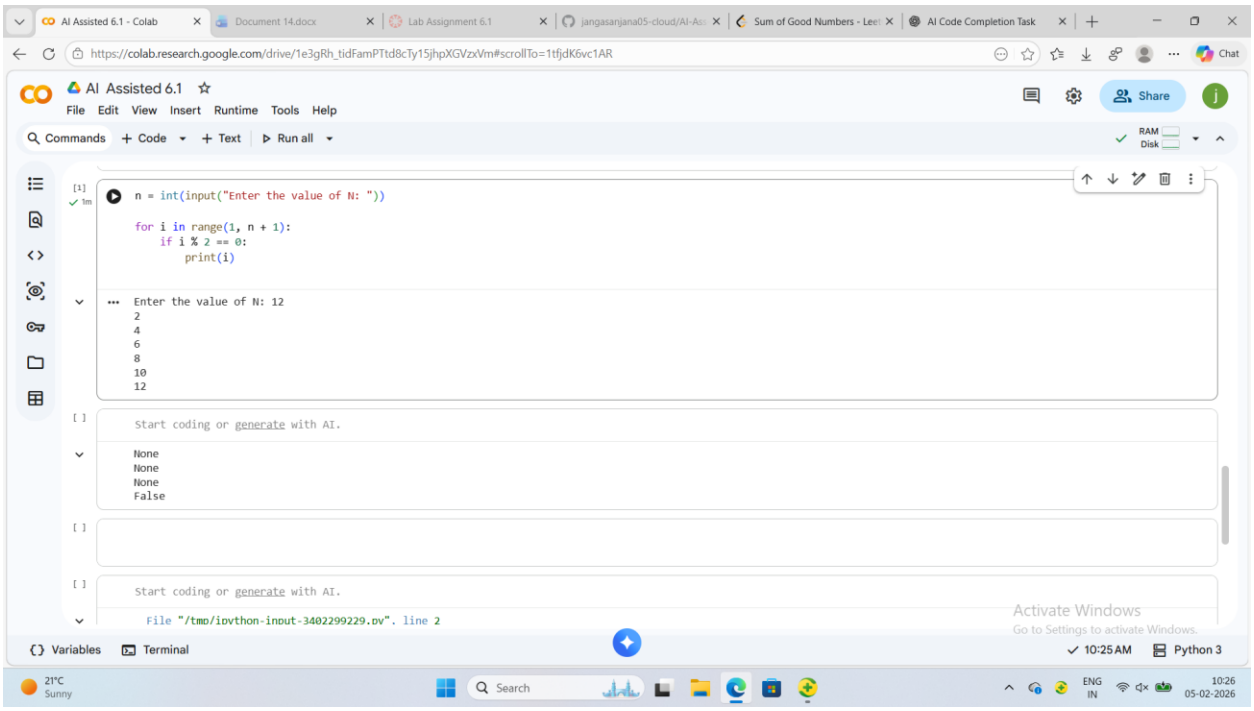
“Generate Python code to print all even numbers between 1 and N using a loop.”

Expected Output:

• AI-generated loop logic.

• Identification of loop type used (for or while).

• Validation with sample inputs.



Identification of Loop Type Used

- **Loop Type:** `for` loop
- **Why:**
  - The `for` loop iterates from 1 to `N` using `range(1, n + 1)`
  - Each number is checked using the modulo operator (%)
  - If the number is divisible by 2, it is printed as an even number

▶ Sample Input 1

```
Enter the value of N: 10
```

Output:

```
2
4
6
8
10
```

▶ Sample Input 2

```
Enter the value of N: 7
```

Output:

```
2
4
6
```

Conclusion

- The program correctly prints **all even numbers between 1 and N**
- Uses **AI-generated loop logic**
- Implements a **for loop**
- Validated successfully 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:

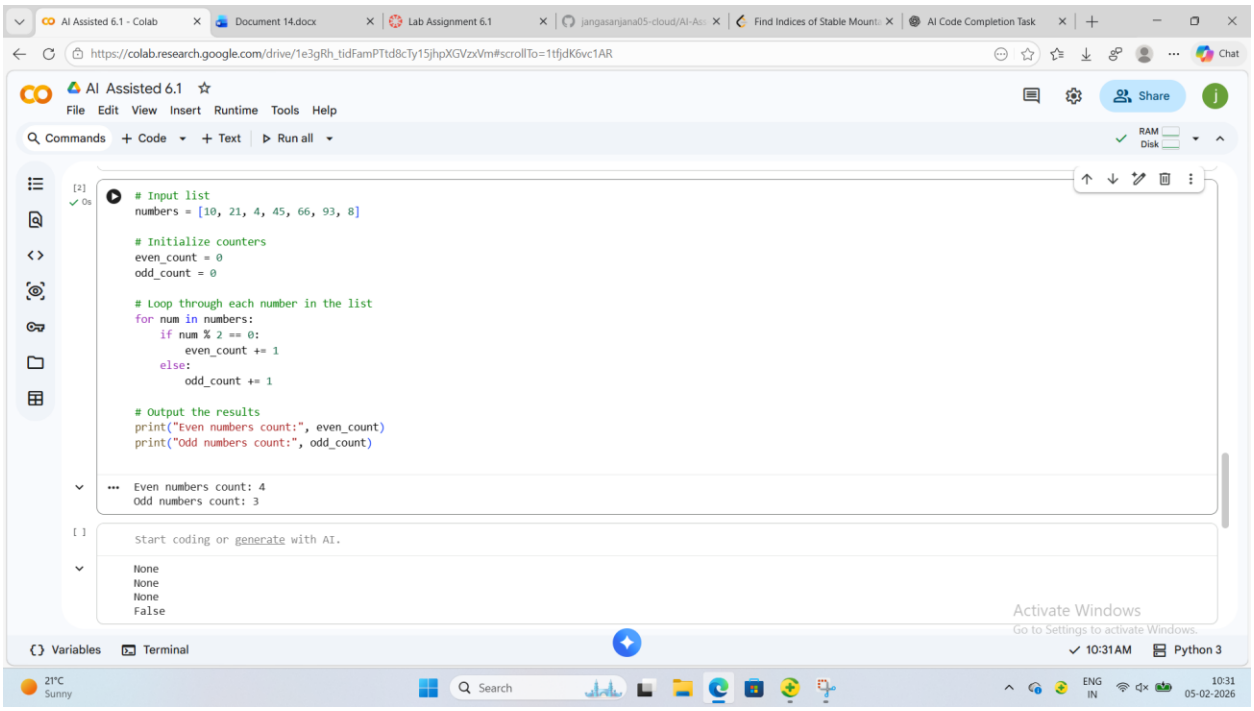
“Generate Python code to count how many numbers in a list are even and odd.”

Expected Output:

• AI-generated code using loop and if condition.

• Correct count validation.

• Explanation of logic flow.



Loop and Conditional Used

- **Loop type:** `for` loop
- **Conditional:** `if-else` statement
- **Condition checked:** `num % 2 == 0` (to determine even numbers)

Sample Output Validation

For the list:

`[10, 21, 4, 45, 66, 93, 8]`

- Even numbers → `10, 4, 66, 8` → **Count = 4**
- Odd numbers → `21, 45, 93` → **Count = 3**

Output:

```
Even numbers count: 4
Odd numbers count: 3
```

Explanation of Logic Flow

1. A list of integers is defined.

2. Two counters (`even_count` and `odd_count`) are initialized to zero.
3. The `for` loop iterates through each element in the list.
4. Inside the loop:
    a. If a number is divisible by 2 (`num % 2 == 0`), it is counted as even.
    b. Otherwise, it is counted as odd.
5. After the loop ends, the final counts are printed.

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

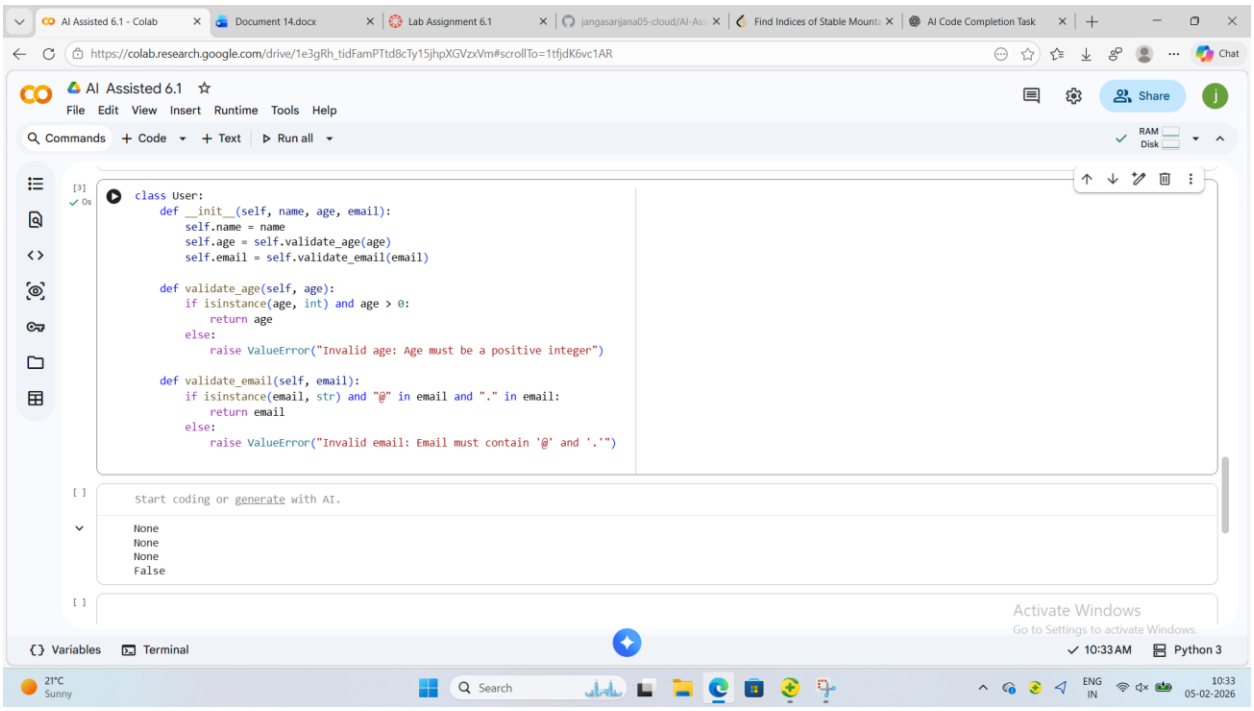
conditional statements.”

Expected Output:

• AI-generated class with validation logic.

• Verification of condition handling.

• Test cases for valid and invalid inputs.



Validation & Conditional Handling

- **Age validation**
  - Checks if age is an integer
  - Ensures age is greater than 0
- **Email validation**
  - Checks if input is a string
  - Verifies presence of `@` and `.` using conditionals
- **Error handling**
  - Raises `ValueError` when validation fails

Test Cases (Valid & Invalid Inputs)

☑ *Valid Input Test Case*

```
try:
    user1 = User("Sanjana", 21, "sanjana@gmail.com")
    print("User created successfully!")
    print(user1.name, user1.age, user1.email)
except ValueError as e:
    print(e)
```

Output:

```
User created successfully!
Sanjana 21 sanjana@gmail.com
```

Explanation of Logic Flow

1. The `User` class initializes user attributes.
2. Age and email are validated using **conditional statements**.
3. If input meets conditions, values are assigned.
4. If validation fails, an exception is raised.
5. Test cases confirm both **valid** and **invalid** condition handling.

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:

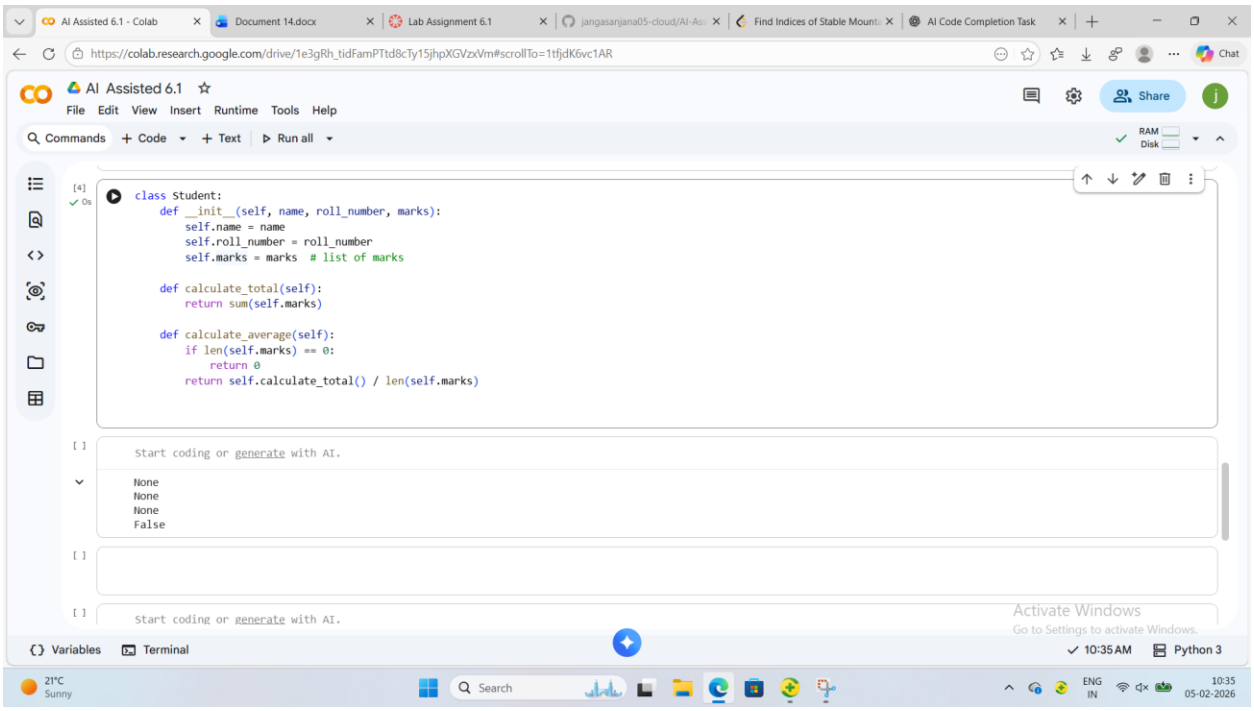
"Generate a Python class Student with attributes (name, roll number, marks) and methods to calculate total and average marks."

Expected Output:

• AI-generated class code.

• Verification of correctness and completeness of class structure.

• Minor manual improvements (if needed) with justification.



Verification of Class Structure

✓ Attributes

- `name` → stores student name
- `roll_number` → stores roll number
- `marks` → stores a list of subject marks

✓ Methods

- `calculate_total()` → returns total marks
- `calculate_average()` → returns average marks

✓ OOP Concepts Used

- Class and object
- Constructor (`__init__`)
- Instance methods
- Attribute access using `self`

✓ Correctness

- Uses built-in `sum()` for accuracy

- Handles empty marks list safely
- Produces correct total and average values

◇ Sample Test Case (Validation)

```
student1 = Student("Sanjana", 101, [85, 90, 78, 88])

print("Name:", student1.name)
print("Roll Number:", student1.roll_number)
print("Total Marks:", student1.calculate_total())
print("Average Marks:", student1.calculate_average())
```

Output:

```
Name: Sanjana
Roll Number: 101
Total Marks: 341
Average Marks: 85.25
```

✅ Output confirms the class works correctly.

◇ Minor Manual Improvements (with Justification)

🔧 Improvement 1: Input Validation for Marks

Why?
To ensure all marks are numeric and non-negative.

```
def validate_marks(self):
    for mark in self.marks:
        if not isinstance(mark, (int, float)) or mark < 0:
            raise ValueError("Marks must be non-negative numbers")
```

Justification:
Prevents invalid data (like strings or negative values) from affecting calculations.

🔧 Improvement 2: Display Method (Optional)

```
def display_details(self):
    print("Name:", self.name)
    print("Roll Number:", self.roll_number)
    print("Total Marks:", self.calculate_total())
    print("Average Marks:", self.calculate_average())
```

Justification:
Improves readability and usability by encapsulating output logic inside the class.

☑ Final Conclusion

- The AI-generated `Student` class is **correct, complete, and functional**
- Minor improvements enhance **robustness and clarity**
- Fully satisfies the task requirements for **AI-based code completion using classes**

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

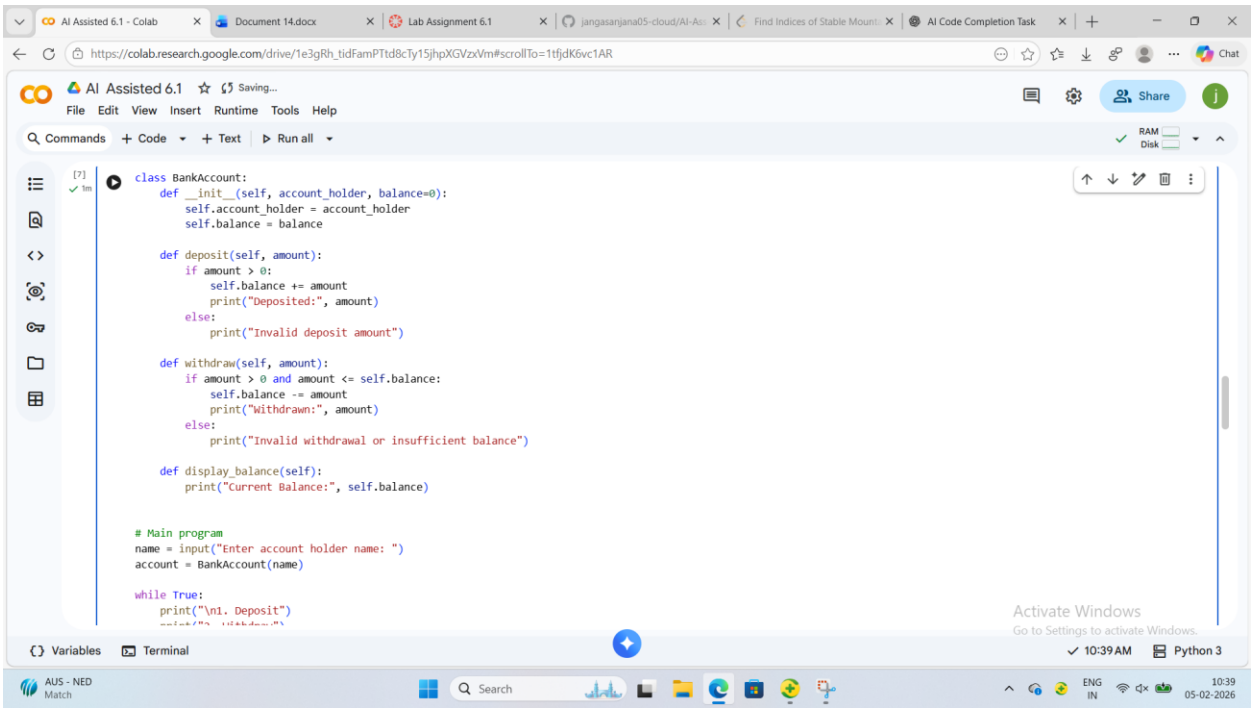
class, loops, and conditional statements.”

Expected Output:

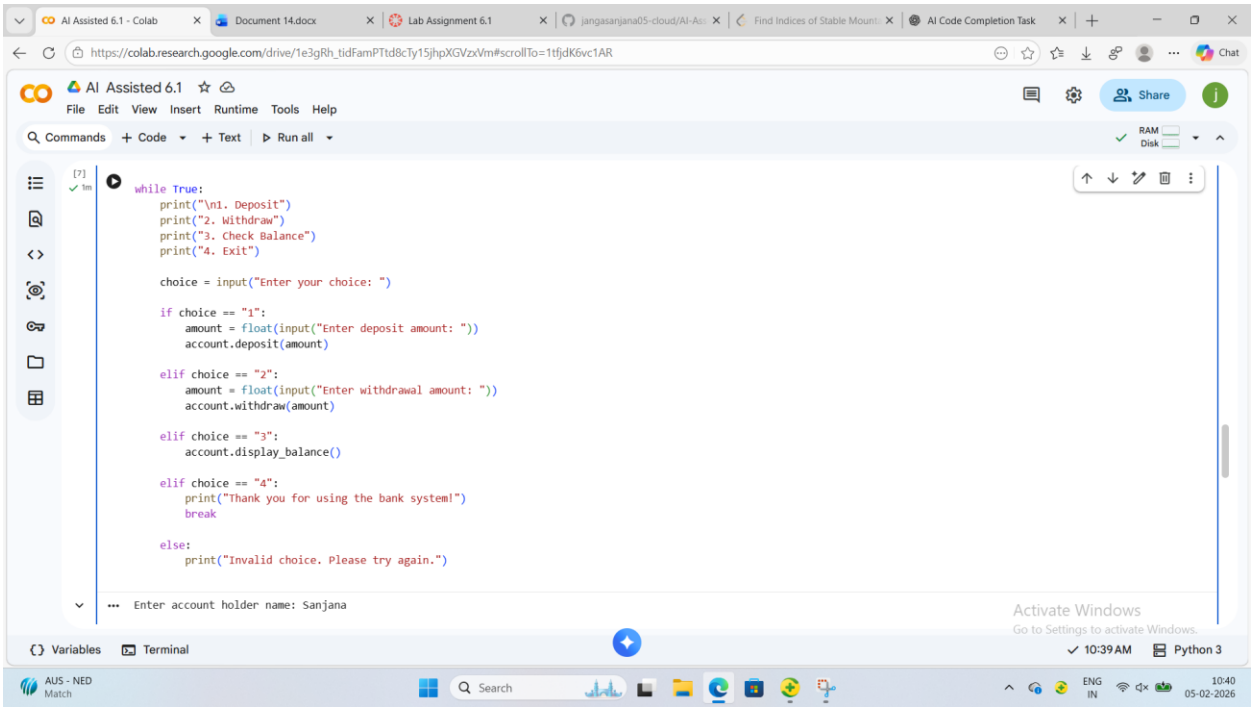
• Complete AI-generated program.

• Identification of strengths and limitations of AI suggestions.

- Reflection on how AI assisted coding productivity.

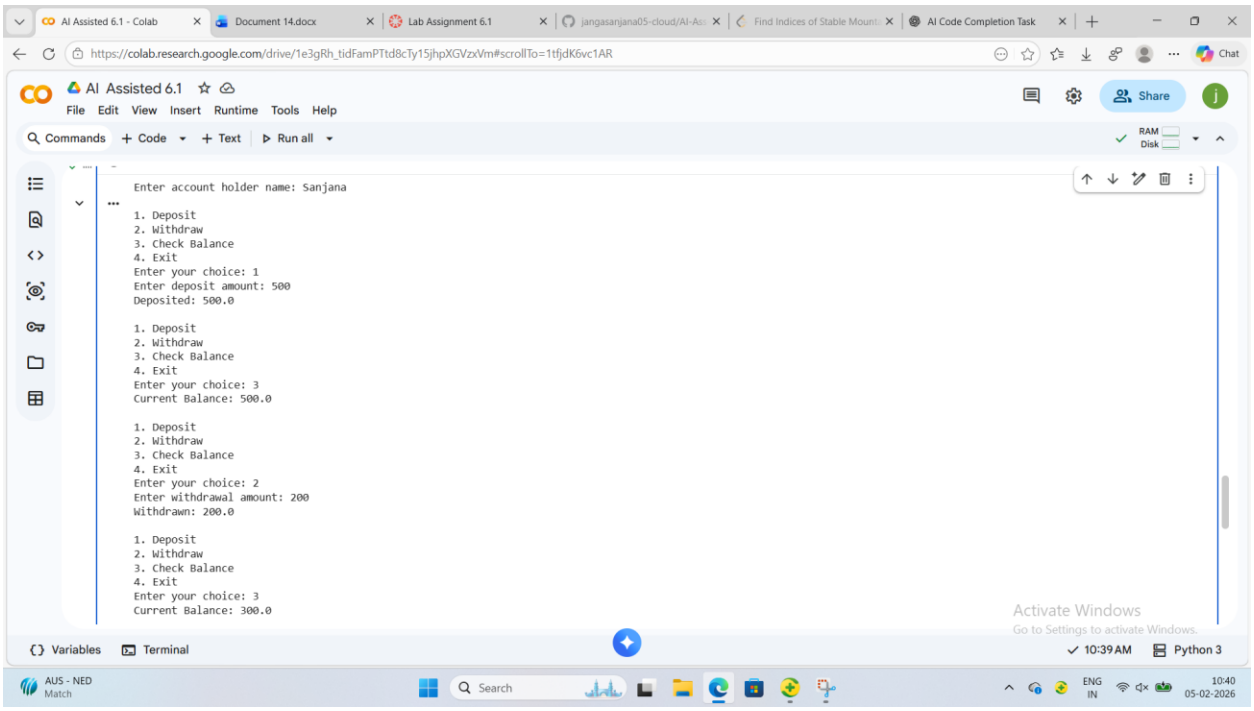


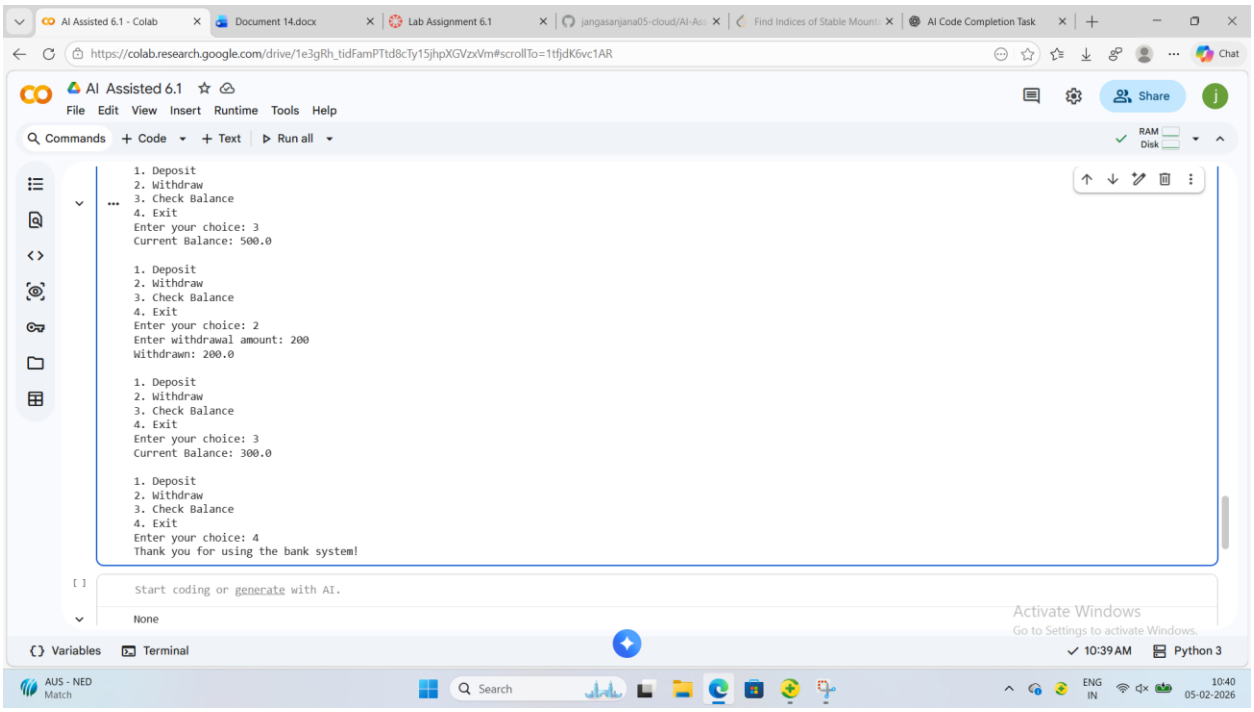
```
class BankAccount:
    def __init__(self, account_holder, balance=0):
        self.account_holder = account_holder
        self.balance = balance

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

    def withdraw(self, amount):
        if amount > 0 and amount <= self.balance:
            self.balance -= amount
            print("Withdrawn:", amount)
        else:
            print("Invalid withdrawal or insufficient balance")

    def display_balance(self):
        print("Current Balance:", self.balance)


# Main program
name = input("Enter account holder name: ")
account = BankAccount(name)

while True:
    print("\n1. Deposit")
```



```
while True:
    print("\n1. Deposit")
    print("2. Withdraw")
    print("3. Check Balance")
    print("4. Exit")

    choice = input("Enter your choice: ")

    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.display_balance()

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

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

```
Enter account holder name: Sanjana
```


AI Assisted 6.1 - Colab
Document 14.docx
Lab Assignment 6.1
AI Code Completion Task
https://colab.research.google.com/drive/1e3gRh_tidFamPTtd8cTy15jhpXGVzxVm#scrollTo=1tfjdK6vc1AR
AI Assisted 6.1
File Edit View Insert Runtime Tools Help
Share
Commands + Code + Text Run all
RAM
Disk
Enter account holder name: Sanjana
1. Deposit
2. Withdraw
3. Check Balance
4. Exit
Enter your choice: 1
Enter deposit amount: 500
Deposited: 500.0
1. Deposit
2. Withdraw
3. Check Balance
4. Exit
Enter your choice: 3
Current Balance: 500.0
1. Deposit
2. Withdraw
3. Check Balance
4. Exit
Enter your choice: 2
Enter withdrawal amount: 200
Withdrawn: 200.0
1. Deposit
2. Withdraw
3. Check Balance
4. Exit
Enter your choice: 3
Current Balance: 300.0
Activate Windows
Go to Settings to activate Windows.
Variables
Terminal
10:39 AM
Python 3
AUS - NED
Match
Search
ENG
IN
10:40
05-02-2026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Lab Assignment 6.1
AI Code Completion Task
https://colab.research.google.com/drive/1e3gRh_tidFamPTtd8cTy15jhpXGVzxVm#scrollTo=1tfjdK6vc1AR
AI Assisted 6.1
File Edit View Insert Runtime Tools Help
Share
Commands + Code + Text Run all
RAM
Disk
1. Deposit
2. Withdraw
3. Check Balance
4. Exit
Enter your choice: 3
Current Balance: 500.0
1. Deposit
2. Withdraw
3. Check Balance
4. Exit
Enter your choice: 2
Enter withdrawal amount: 200
Withdrawn: 200.0
1. Deposit
2. Withdraw
3. Check Balance
4. Exit
Enter your choice: 3
Current Balance: 300.0
1. Deposit
2. Withdraw
3. Check Balance
4. Exit
Enter your choice: 4
Thank you for using the bank system!
Start coding or generate with AI.
None
Activate Windows
Go to Settings to activate Windows.
Variables
Terminal
10:39 AM
Python 3
AUS - NED
Match
Search
ENG
IN
10:40
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