# ASSIGNMENT 6.3

**NAME:** K.NAGA CHAITANYA

**HALLTICKETNO:** 2303A51292

**BATCH:** 05

TASK1:

Scenario

You are developing a simple student information management module.

Task

• Use an AI tool (GitHub Copilot / Cursor AI / Gemini) to complete a Student class.

• The class should include attributes such as name, roll number, and branch.

• Add a method display_details() to print student information.

• Execute the code and verify the output.

• Analyze the code generated by the AI tool for correctness and clarity.

**PROMPT:**Create a Python Student class with attributes name, roll_number, and branch.
Add a method display_details() to print the student information.
Create a sample object, call the method, and show the output.
Also give a short analysis of the code.

**OUTPUT:**

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

    def display_details(self):
        print(f"Student Name: {self.name}")
        print(f"Roll Number: {self.roll_number}")
        print(f"Branch: {self.branch}")

# Create a student object
student1 = Student("Alice Smith", "CS001", "Computer Science")

# Display student details
student1.display_details()
```

```
Student Name: Alice Smith
Roll Number: CS001
Branch: Computer Science
```

## TASK 2:

Scenario

You are writing a utility function to display multiples of a given number.

Task

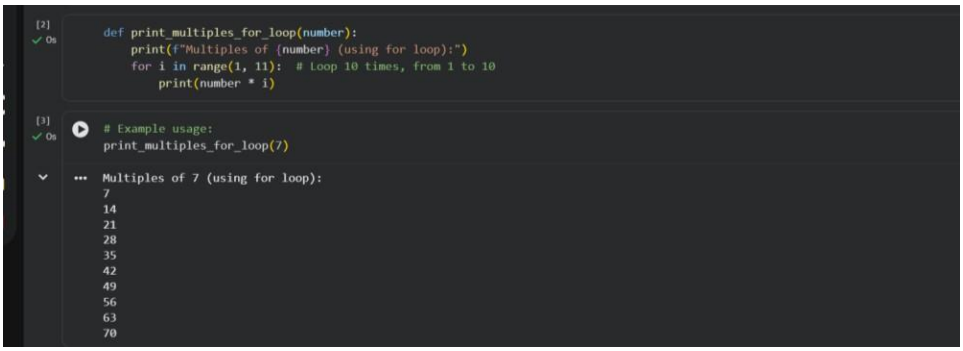
• Prompt the AI tool to generate a function that prints the first 10 multiples of a given number using a loop.

• Analyze the generated loop logic.

• Ask the AI to generate the same functionality using another controlled looping structure (e.g., while instead of for)

PROMPT: Write a Python function that prints the **first 10 multiples** of a given number using a **for loop**. Explain the loop logic briefly

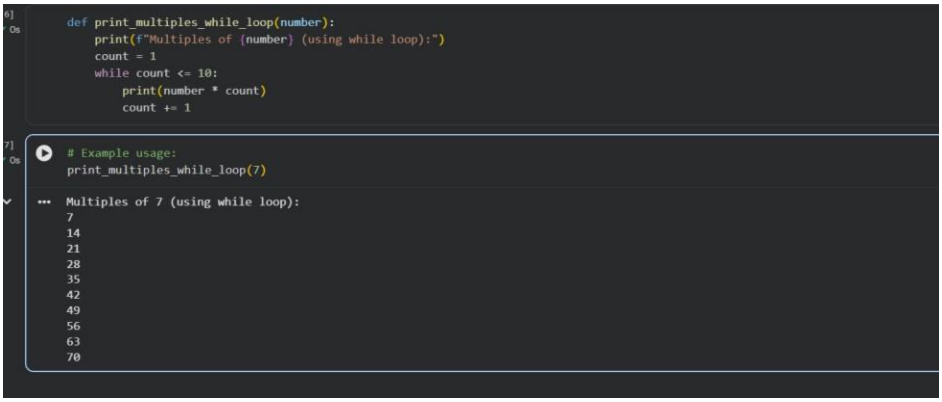
## OUTPUT:



```
[2]
✓ 0s
    def print_multiples_for_loop(number):
        print(f"Multiples of {number} (using for loop):")
        for i in range(1, 11):  # Loop 10 times, from 1 to 10
            print(number * i)

[3]
✓ 0s
    # Example usage:
    print_multiples_for_loop(7)

    Multiples of 7 (using for loop):
    7
    14
    21
    28
    35
    42
    49
    56
    63
    70
```



```
    def print_multiples_while_loop(number):
        print(f"Multiples of {number} (using while loop):")
        count = 1
        while count <= 10:
            print(number * count)
            count += 1

    # Example usage:
    print_multiples_while_loop(7)

    Multiples of 7 (using while loop):
    7
    14
    21
    28
    35
    42
    49
    56
    63
    70
```

Task Description #3: Conditional Statements (Age Classification)

Scenario

You are building a basic classification system based on age.

Task

• Ask the AI tool to generate nested if-elif-else conditional statements to classify age groups (e.g., child, teenager, adult, senior).

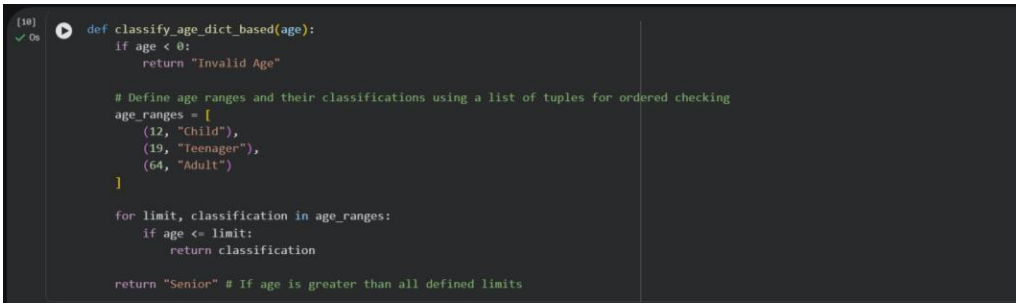
• Analyze the generated conditions and logic.

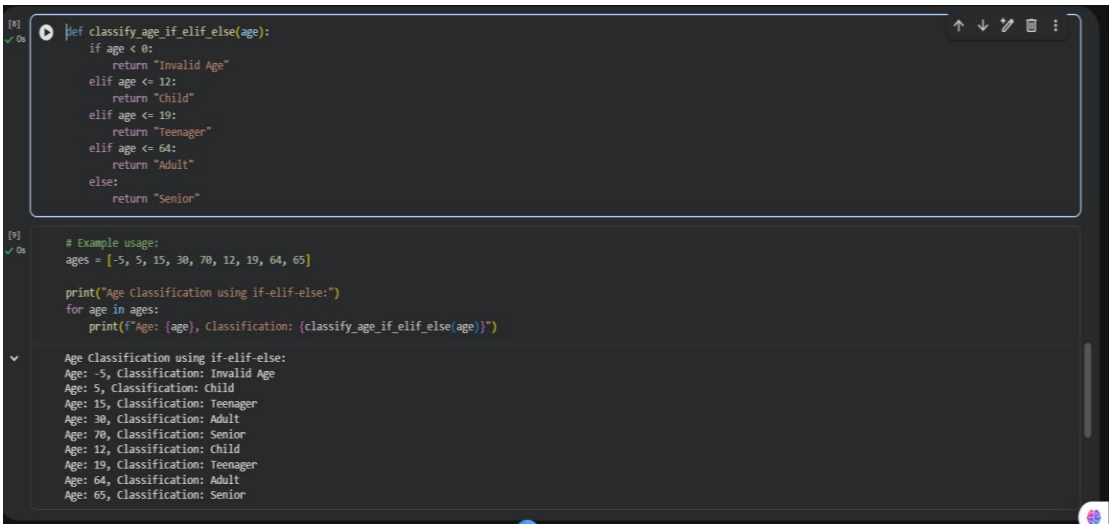
• Ask the AI to generate the same classification using alternative conditional structures (e.g., simplified conditions or dictionary-based logic)

PROMPT:

Write a Python program that classifies a person based on age using **if–elif–else** statements (child, teenager, adult, senior

OUTPUT:



```
def classify_age_if_elif_else(age):
    if age < 0:
        return "Invalid Age"
    elif age <= 12:
        return "Child"
    elif age <= 19:
        return "Teenager"
    elif age <= 64:
        return "Adult"
    else:
        return "Senior"

# Example usage:
ages = [-5, 5, 15, 30, 70, 12, 19, 64, 65]

print("Age Classification using if-elif-else:")
for age in ages:
    print(f"Age: {age}, Classification: {classify_age_if_elif_else(age)}")
```

```
Age Classification using if-elif-else:
Age: -5, Classification: Invalid Age
Age: 5, Classification: Child
Age: 15, Classification: Teenager
Age: 30, Classification: Adult
Age: 70, Classification: Senior
Age: 12, Classification: Child
Age: 19, Classification: Teenager
Age: 64, Classification: Adult
Age: 65, Classification: Senior
```

Task Description #4: For and While Loops (Sum of First n Numbers)

Scenario

You need to calculate the sum of the first n natural numbers.

Task

• Use AI assistance to generate a sum_to_n() function using a for loop.

• Analyze the generated code.

• Ask the AI to suggest an alternative implementation using a while loop or a mathematical

Formula

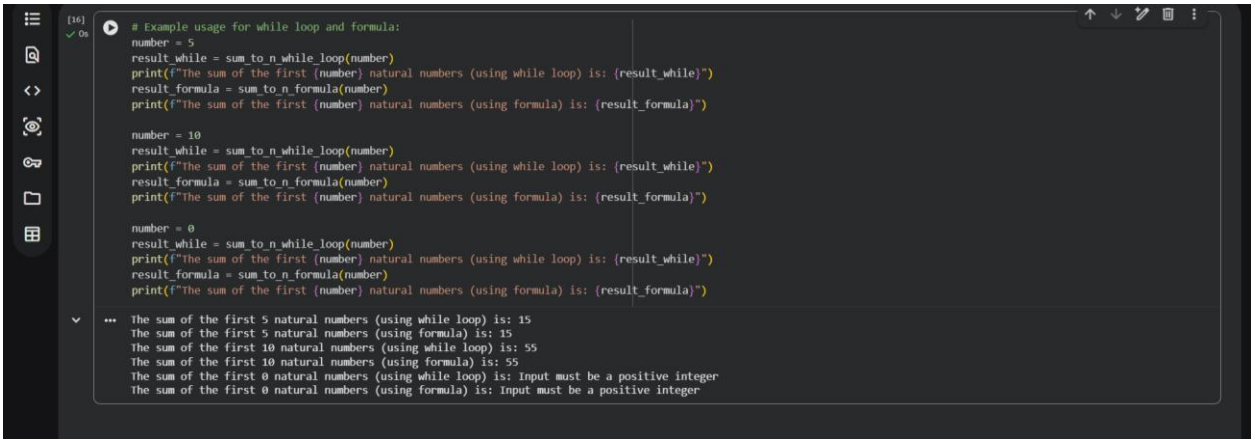
PROMPT:

Write a Python function `sum_to_n(n)` that calculates the sum of the first `n` natural numbers using a **for loop**.
Display the result and explain the code briefly

OUTPUT:

```
def sum_to_n_while_loop(n):
    if n < 1:
        return "Input must be a positive integer"
    total_sum = 0
    count = 1
    while count <= n:
        total_sum += count
        count += 1
    return total_sum

def sum_to_n_formula(n):
    if n < 1:
        return "Input must be a positive integer"
    # Gauss's formula for the sum of the first n natural numbers
    return n * (n + 1) // 2
```



```
[16]
✓ 0s
# Example usage for while loop and formula:
number = 5
result_while = sum_to_n_while_loop(number)
print(f"The sum of the first {number} natural numbers (using while loop) is: {result_while}")
result_formula = sum_to_n_formula(number)
print(f"The sum of the first {number} natural numbers (using formula) is: {result_formula}")

number = 10
result_while = sum_to_n_while_loop(number)
print(f"The sum of the first {number} natural numbers (using while loop) is: {result_while}")
result_formula = sum_to_n_formula(number)
print(f"The sum of the first {number} natural numbers (using formula) is: {result_formula}")

number = 0
result_while = sum_to_n_while_loop(number)
print(f"The sum of the first {number} natural numbers (using while loop) is: {result_while}")
result_formula = sum_to_n_formula(number)
print(f"The sum of the first {number} natural numbers (using formula) is: {result_formula}")

...
The sum of the first 5 natural numbers (using while loop) is: 15
The sum of the first 5 natural numbers (using formula) is: 15
The sum of the first 10 natural numbers (using while loop) is: 55
The sum of the first 10 natural numbers (using formula) is: 55
The sum of the first 0 natural numbers (using while loop) is: Input must be a positive integer
The sum of the first 0 natural numbers (using formula) is: Input must be a positive integer
```

Task Description #5: Classes (Bank Account Class)

Scenario

You are designing a basic banking application.

Task

• Use AI tools to generate a Bank Account class with methods such as deposit(), withdraw(), and check_balance().

• Analyze the AI-generated class structure and logic.

• Add meaningful comments and explain the working of the code

PROMPT:

Create a Python **BankAccount** class with attributes like `account_number` and `balance`.
Add methods `deposit()`, `withdraw()`, and `check_balance()`.
Show sample object creation and method calls

OUTPUT:

```python
class BankAccount:
    def __init__(self, account_holder, initial_balance=0):
        # Constructor to initialize a new bank account
        # account_holder: Name of the account owner
        # initial_balance: Starting balance, defaults to 0
        self.account_holder = account_holder
        self.balance = initial_balance
        print(f"Account for {self.account_holder} created with initial balance: ${self.balance:.2f}")

    def deposit(self, amount):
        # Method to deposit money into the account
        # amount: The amount to be deposited
        if amount > 0:
            self.balance += amount
            print(f"Deposited: ${amount:.2f}. New balance: ${self.balance:.2f}")
        else:
            print("Deposit amount must be positive.")

    def withdraw(self, amount):
        # Method to withdraw money from the account
        # amount: The amount to be withdrawn
        if amount > 0:
            if self.balance >= amount:
                self.balance -= amount
                print(f"Withdrew: ${amount:.2f}. New balance: ${self.balance:.2f}")
            else:
                print("Insufficient funds.")
        else:
            print("Withdrawal amount must be positive.")
```

```python
    def check_balance(self):
        # Method to display the current account balance
        print(f"Current balance for {self.account_holder}: ${self.balance:.2f}")

# --- Example Usage ---
print("\n--- Creating and managing Bank Accounts ---")

# Create a new bank account
account1 = BankAccount("John Doe", 1000)

# Check initial balance
account1.check_balance()

# Perform a deposit
account1.deposit(500)

# Perform a withdrawal
account1.withdraw(200)

# Try to withdraw more than available
account1.withdraw(1500)

# Try invalid deposit/withdrawal amounts
account1.deposit(-100)
account1.withdraw(0)

# Check final balance
account1.check_balance()

print("\n--- Another Account Example ---")
```

```python
account1.deposit(-100)
account1.withdraw(0)

# Check final balance
account1.check_balance()

print("\n--- Another Account Example ---")
account2 = BankAccount("Jane Smith") # No initial balance specified, defaults to 0
account2.deposit(250.75)
account2.check_balance()
```

```
--- Creating and managing Bank Accounts ---
Account for John Doe created with initial balance: $1000.00
Current balance for John Doe: $1000.00
Deposited: $500.00. New balance: $1500.00
Withdrew: $200.00. New balance: $1300.00
Insufficient funds.
Deposit amount must be positive.
Withdrawal amount must be positive.
Current balance for John Doe: $1300.00

--- Another Account Example ---
Account for Jane Smith created with initial balance: $0.00
Deposited: $250.75. New balance: $250.75
Current balance for Jane Smith: $250.75
```