Python Programming Assignment 02

Question 1: Variables and Data Types

Problem: Write a Python program that:

1. Accepts a string, an integer, a float, and a boolean from the user.
2. Initializes variables for each type, and prints them out.
3. Convert the string to uppercase and print it.
4. Check if the integer is even or odd and print the result.
5. Multiply the float by 2 and print the result.

```
# Accepting user's inputs for different Data types
string = input("Enter a string: ") # Taking string input from user
integer = None
floating_point = None
boolean = None

# Validate integer input
while True:
    try:
        integer = int(input("Enter an integer: ")) # Taking Integer input from user
        break
    except ValueError:
        print("Invalid input! Please enter a valid integer")

# Validating the float data input
while True:
    try:
        floating_point = float(input("Enter a float: ")) # Taking float input from user
        break
    except ValueError:
        print("Invalid input! Please enter a valid float")

# Handling boolean inpt correctly
boolean_input = input("Enter a boolean(True/False): ").strip().lower()

# Convert string input to boolean: If input is "True", store true: otherwise, store False
boolean = boolean_input == "true"

# proceeding output
print("\n--- Output ---")

# To Print the uppercase of user's input string
print("Upper String: ", string.upper())

# Checking for even or odd integer and print them
if integer % 2 == 0:
  print(f"The number {integer} is Even")
else:
  print(f"The number {integer} is odd")

# Multiply the float value by 2 and print them
print("Double float: ", floating_point*2)
```

```
Enter a string: Ahmad Ali Rafique
Enter an integer: 2468
Enter a float: 3.14
Enter a boolean(True/False): false

--- Output ---
Upper String:  AHMAD ALI RAFIQUE
The number 2468 is Even
Double float:  6.28
```

Question 2: Operators

Problem: Write a Python program that:

1. Accepts two numbers as input from the user.
2. Performs and prints the result of all the arithmetic operations (addition, subtraction, multiplication, division, modulus, flow division) between these two numbers.
3. Use comparison operators to check if the first number is greater than the second, and if they are equal.
4. Use logical operators to combine two conditions (e.g., the first number is greater than the second, and the second number is less than 10).

```
# Take two inputs form user
while True:
    try:
        num1 = float(input("Enter first number: ")) # First number
        num2 = float(input("Enter second number: ")) # Second number
        break
    except ValueError:
        print("Invaid input! Please enter valid input") # handle non-numeric values

# Performing arithmetic operations
addition = num1 + num2 # Addition
subtraction = num1 - num2 # Subtraction
multiplication = num1 * num2 # Multiplication

# Handling to prevent devision by zero error
if num2 !=0:
    division = num1 / num2 # Division
    modulus = num1 % num2 # Modulus
    flow_division = num1 // num2 # Flow Division
else:
    division = "Undefined (Cannot divide by zero)"
    modulus = "Undefined (Cannot calculate modulus with zero)"
    flow_division = "Undefined (Cannot perform flow division by zero)"

# Print Arithmentc opration results
print("\n--- Output ---")

print("Addition: ", addition)
print("Subtraction: ", subtraction)
print("Multiplication: ", multiplication)
print("Division: ", division)
print("Modulus: ", modulus)
print("Flow Division: ", flow_division)

# comparison operators to check if the first number is greater than the second, and if they are equal
greater_than = num1 > num2
equal_to = num1 ==num2

print("\n--- Comparison ---")
print("First number is greater than second: ", greater_than)
print("First number is equal to second: ", equal_to)

# logical operators to combine two conditions (e.g., the first number is greater than the second, and the second number is less than 10)
both_conditions = num1 > num2 and num2 < 10
print("\n--- Logical Operation ---")
print("Both conditions are True: ", both_conditions10)
```

```
Enter first number: 10
Enter second number:
Invaid input! Please enter valid input
Enter first number: 54
Enter second number: 45

--- Output ---
Addition:  99.0
Subtraction:  9.0
Multiplication:  2430.0
Division:  1.2
Modulus:  9.0
Flow Division:  1.0

--- Comparison ---
First number is greater than second:  True
First number is equal to second:  False

--- Logical Operation ---
```

```
Both conditions are True:  False
```

Question 3: Loops

Problem: Write a Python program that:

1. Accepts a list of integers from the user.
2. Loops through the list and prints out each number.
3. If a number is greater than 10, skip it using the continue statement.
4. Stop the loop if the number is 20 using the break statement.
5. After the loop ends, print a message that the loop ended naturally.

```
# Taking input from user and converting it into list of integers
input_list = list(map(int, input("Enter a list of numbers separated by spaces: ").split())) # Use split function to separated by spaces

# Start loop for the list
for num in input_list:
    if num == 20:
        print(f"Breaking at {num}")
        break # If this condition true then program stop exection at strating point

    # If the number is lower then 10 then print it
    if num < 10:
        print(num)

    # If the number is bigger then 10  then print skipping that number
    if num > 10:
        print(f"Skipping {num}")
        continue

        # Print the loop
        print(num)

print("Loops end naturally")
```

```
Enter a list of numbers separated by spaces: 2 4 6 8 10 12 14 16 18 20 22 24
2
4
6
8
Skipping 12
Skipping 14
Skipping 16
Skipping 18
Breaking at 20
Loops end naturally
```