INTEGRATIVE PROGRAMMING AND TECHNOLOGIES
IT0011

Eadward Andrei D. Lladoc ***TB22***

Library Activity 5: Function

Create a program that will simulate the following mathematical operations. Design a menu that will ask the user to enter the choice and provide each functions for each operations. The functions must provide the following validation on each given input. A None value must be return.

[D] - Divide (the second number or denominator must not be equal to zero)
[E] - Exponentiation
[R] - Remainder (the second number or denominator must not be equal to zero)
[F] - Summation (the two numbers are the limits and it must be the second number must be greater than the first number, if the input is 4 and 8 the sum must be 4 + 5 + 6 + 7 + 8).

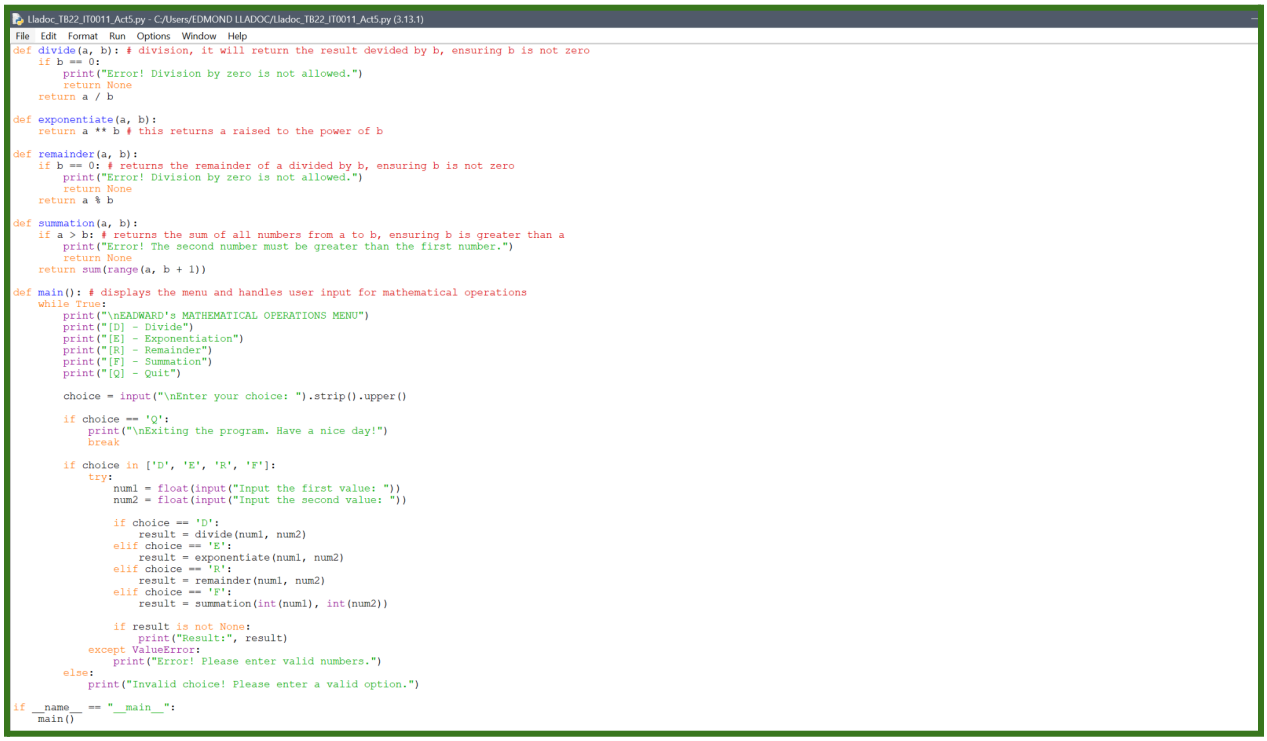
Answer:

Source Code - Copy & Paste

```
def divide(a, b): # division, it will return the result devided by b, ensuring b is not zero
    if b == 0:
        print("Error! Division by zero is not allowed.")
        return None
    return a / b

def exponentiate(a, b):
    return a ** b # this returns a raised to the power of b

def remainder(a, b):
    if b == 0: # returns the remainder of a divided by b, ensuring b is not zero
        print("Error! Division by zero is not allowed.")
        return None
    return a % b

def summation(a, b):
    if a > b: # returns the sum of all numbers from a to b, ensuring b is greater than a
        print("Error! The second number must be greater than the first number.")
        return None
    return sum(range(a, b + 1))

def main(): # displays the menu and handles user input for mathematical operations
    while True:
        print("\nEADWARD's MATHEMATICAL OPERATIONS MENU")
        print("[D] - Divide")
        print("[E] - Exponentiation")
        print("[R] - Remainder")
        print("[F] - Summation")
        print("[Q] - Quit")

        choice = input("\nEnter your choice: ").strip().upper()
```

```
        if choice == 'Q':
            print("\nExiting the program. Have a nice day!")
            break

        if choice in ['D', 'E', 'R', 'F']:
            try:
                num1 = float(input("Input the first value: "))
                num2 = float(input("Input the second value: "))

                if choice == 'D':
                    result = divide(num1, num2)
                elif choice == 'E':
                    result = exponentiate(num1, num2)
                elif choice == 'R':
                    result = remainder(num1, num2)
                elif choice == 'F':
                    result = summation(int(num1), int(num2))

                if result is not None:
                    print("Result:", result)
            except ValueError:
                print("Error! Please enter valid numbers.")
        else:
            print("Invalid choice! Please enter a valid option.")

if __name__ == "__main__":
    main()
```

Source Code - Screenshot



Program Output - Screenshot

```
========== RESTART: C:/Users/EDMOND LLADOC/Lladoc_TB22_IT0011_Act5.py ==========

EADWARD's MATHEMATICAL OPERATIONS MENU
[D] - Divide
[E] - Exponentiation
[R] - Remainder
[F] - Summation
[Q] - Quit

Enter your choice: D
Input the first value: 60
Input the second value: 5
Result: 12.0

EADWARD's MATHEMATICAL OPERATIONS MENU
[D] - Divide
[E] - Exponentiation
[R] - Remainder
[F] - Summation
[Q] - Quit

Enter your choice: E
Input the first value: 60
Input the second value: 5
Result: 777600000.0

EADWARD's MATHEMATICAL OPERATIONS MENU
[D] - Divide
[E] - Exponentiation
[R] - Remainder
[F] - Summation
[Q] - Quit

Enter your choice: R
Input the first value: 60
Input the second value: 5
Result: 0.0

EADWARD's MATHEMATICAL OPERATIONS MENU
[D] - Divide
[E] - Exponentiation
[R] - Remainder
[F] - Summation
[Q] - Quit

Enter your choice: F
Input the first value: 60
Input the second value: 5
Error! The second number must be greater than the first number.
```

```
EADWARD's MATHEMATICAL OPERATIONS MENU
[D] - Divide
[E] - Exponentiation
[R] - Remainder
[F] - Summation
[Q] - Quit

Enter your choice: F
Input the first value: 5
Input the second value: 60
Result: 1820

EADWARD's MATHEMATICAL OPERATIONS MENU
[D] - Divide
[E] - Exponentiation
[R] - Remainder
[F] - Summation
[Q] - Quit

Enter your choice: Q

Exiting the program. Have a nice day!
```