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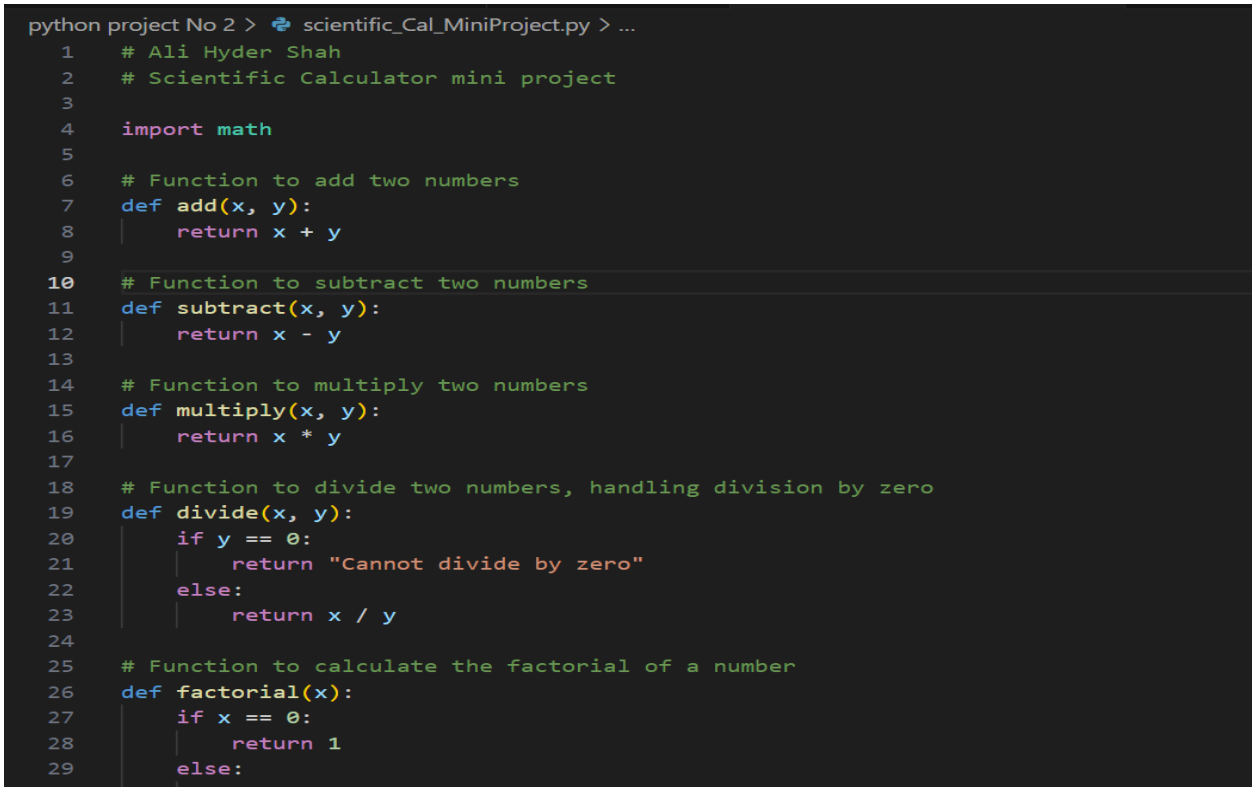
Project: Scientific Calculator

Overview of the project:

Scientific Calculator" mini-project provides a basic yet functional implementation of a scientific calculator in Python, suitable for educational purposes

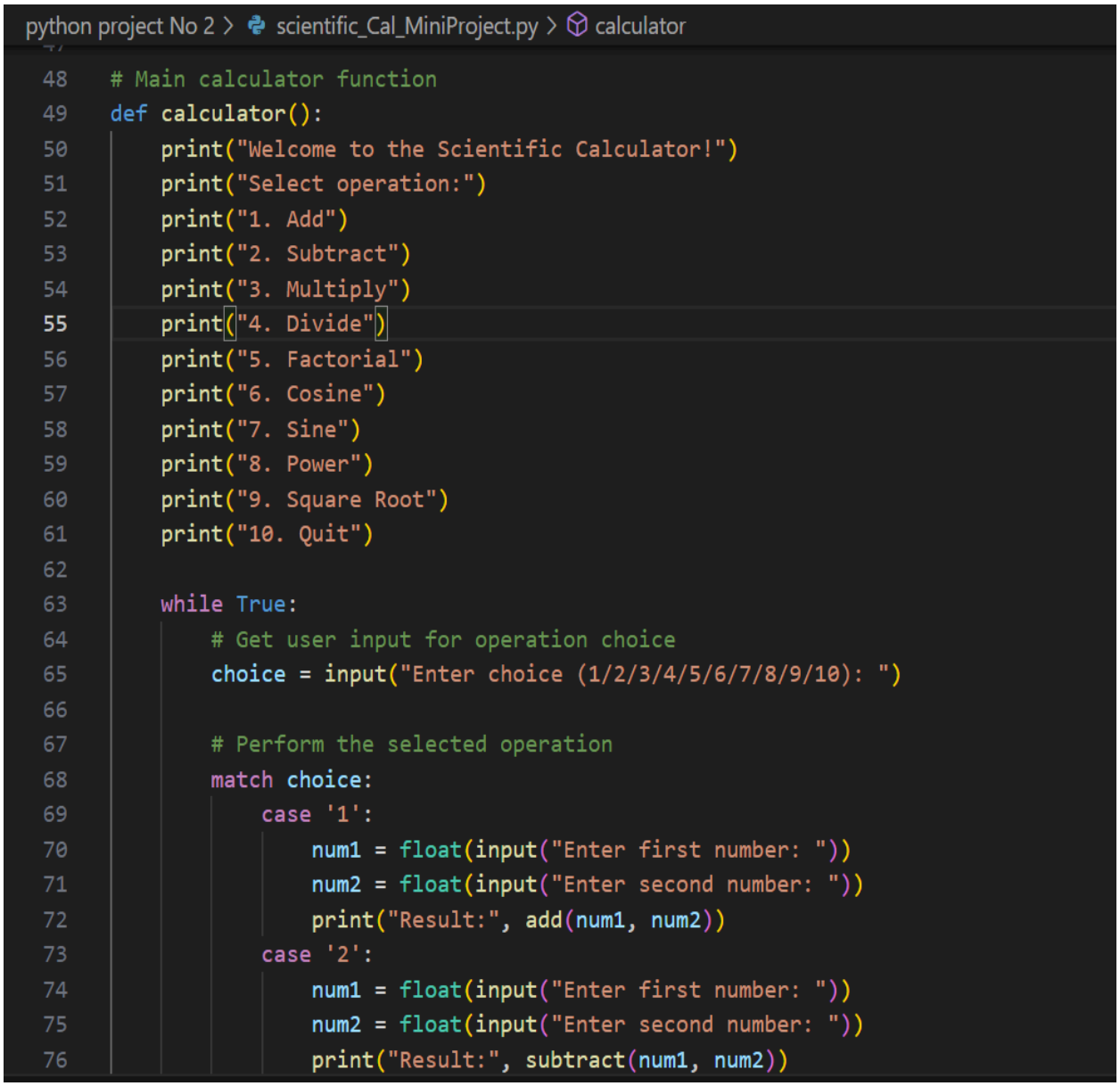
Explanation of the code logic:

Function Definitions: The program defines several functions to perform individual mathematical operations:
Addition (add)
Subtraction (subtract)
Multiplication (multiply)
Division (divide)
Factorial (factorial)
Cosine (cosine)
Sine (sine)
Power (power)
Square Root (square_root)



Main Calculator Function: The calculator() function serves as the main entry point for the program. It displays a menu of available operations and prompts the user to choose one. Based on the user's selection, it executes the corresponding function.

User Input Handling: The program prompts the user to input numbers and handles potential errors such as invalid inputs or division by zero. It ensures that the user enters numeric values where required and provides appropriate error messages for invalid inputs



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Menu-Driven Interface: The user interacts with the calculator through a simple menu-driven interface. After each operation, the program displays the result and prompts the user to select another operation or quit.

Output:

GitHub repository Link:
https://github.com/alihydershah110/BanoQabil-2.0-Python-Course/tree/main/python%20project%20No%202

CODE:

```
# Ali Hyder Shah
# Scientific Calculator mini project

import math

# Function to add two numbers
def add(x, y):
    return x + y

# Function to subtract two numbers
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def subtract(x, y):
    return x - y

# Function to multiply two numbers
def multiply(x, y):
    return x * y

# Function to divide two numbers, handling division by zero
def divide(x, y):
    if y == 0:
        return "Cannot divide by zero"
    else:
        return x / y

# Function to calculate the factorial of a number
def factorial(x):
    if x == 0:
        return 1
    else:
        return x * factorial(x-1)

# Function to calculate the cosine of a number (in radians)
def cosine(x):
    return math.cos(x)

# Function to calculate the sine of a number (in radians)
def sine(x):
    return math.sin(x)

# Function to calculate the power of a number
def power(x, y):
    return x ** y

# Function to calculate the square root of a number
def square_root(x):
    return math.sqrt(x)

# Main calculator function
def calculator():
    print("Welcome to the Scientific Calculator!")
    print("Select operation:")
    print("1. Add")
    print("2. Subtract")
    print("3. Multiply")
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print("4. Divide")
print("5. Factorial")
print("6. Cosine")
print("7. Sine")
print("8. Power")
print("9. Square Root")
print("10. Quit")

while True:
    # Get user input for operation choice
    choice = input("Enter choice (1/2/3/4/5/6/7/8/9/10): ")

    # Perform the selected operation
    match choice:
        case '1':
            num1 = float(input("Enter first number: "))
            num2 = float(input("Enter second number: "))
            print("Result:", add(num1, num2))
        case '2':
            num1 = float(input("Enter first number: "))
            num2 = float(input("Enter second number: "))
            print("Result:", subtract(num1, num2))
        case '3':
            num1 = float(input("Enter first number: "))
            num2 = float(input("Enter second number: "))
            print("Result:", multiply(num1, num2))
        case '4':
            num1 = float(input("Enter first number: "))
            num2 = float(input("Enter second number: "))
            print("Result:", divide(num1, num2))
        case '5':
            num = int(input("Enter a number: "))
            print("Result:", factorial(num))
        case '6':
            num = float(input("Enter a number in radians: "))
            print("Result:", cosine(num))
        case '7':
            num = float(input("Enter a number in radians: "))
            print("Result:", sine(num))
        case '8':
            num1 = float(input("Enter base: "))
            num2 = float(input("Enter exponent: "))
            print("Result:", power(num1, num2))
        case '9':
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            num = float(input("Enter a number: "))
            print("Result:", square_root(num))
        case '10':
            print("Thank you for using the calculator!")
            return
        case _:
            print("Invalid input. Please enter a valid option.")

# Call the calculator function to start the program
calculator()
```