Assignment 2: Write a calculator program to perform add, subtract, multiply and divide operations by receiving the values as command line arguments

Main Method

```
import java.util.Scanner;

public class CalculatorApp2 {
    public static void main(String[] args) {
        int choice;
        int maxAttempts = 3; // Maximum attempts for valid input
        Scanner scan = new Scanner(System.in);

        do {
             calculator(maxAttempts);
            System.out.println("\n1. Continue");
            System.out.println("2. Exit");
            System.out.print("\nEnter Your Choice (1-2): ");
            choice = scan.nextInt();

            // Input validation for main menu choice with limited attempts
            int attempts = 0;
            while ((choice < 1 || choice > 2) && attempts < maxAttempts) {
                attempts++;
                System.out.println("\nInvalid Choice! Attempt " + attempts + " of " + maxAttempts);
                System.out.println("1. Continue");
                System.out.println("2. Exit");
                System.out.print("\nEnter Your Choice (1-2): ");
                choice = scan.nextInt();
            }

            if (attempts >= maxAttempts) {
                System.out.println("\nMaximum attempts reached. Exiting the application.");
                break;
            }

            if (choice == 2) {
                System.out.println("\nGood Bye!! Have a nice day");
            }
        } while (choice == 1);

        scan.close();
    }
```

In the **main** method, the program enters a loop where users can perform calculations until they choose to exit. The loop continues if the user selects option 1 (Continue).

Calculator Method

```
public static void calculator(int maxAttempts) {
    float a, b, res;
    int choice;
    Scanner scan = new Scanner(System.in);

    System.out.println("1. Addition (+)");
    System.out.println("2. Subtraction (-)");
    System.out.println("3. Multiplication (*)");
    System.out.println("4. Division (/)");
    System.out.print("Enter Your Choice (1-4): ");
    choice = scan.nextInt();

    // Input validation for calculator options
    int attempts = 0;
    while ((choice < 1 || choice > 4) && attempts < maxAttempts) {
        attempts++;
        System.out.println("\nInvalid Choice! Attempt " + attempts + " of " + maxAttempts);
        System.out.println("1. Addition (+)");
        System.out.println("2. Subtraction (-)");
        System.out.println("3. Multiplication (*)");
        System.out.println("4. Division (/)");
        System.out.print("Enter Your Choice (1-4): ");
        choice = scan.nextInt();
    }

    if (attempts >= maxAttempts) {
        System.out.println("\nMaximum attempts reached for calculator input. Exiting the application.");
        scan.close();
        System.exit(0);
    }

    System.out.print("\nEnter First Number: ");
    a = scan.nextFloat();
    System.out.print("Enter Second Number: ");
    b = scan.nextFloat();

    if (choice == 1)
        res = a + b;
    else if (choice == 2)
        res = a - b;
    else if (choice == 3)
        res = a * b;
    else
        res = a / b;

    System.out.println("\nResult = " + res);

    scan.close();
}
```

- Inside the loop, the **`calculator`** method is called to perform the actual calculations. Users can choose from four operations: addition, subtraction, multiplication, and division. The user's choice is validated, and they are prompted to enter two numbers for the chosen operation. The result is then calculated and displayed.

- If the user's input is invalid within a certain number of attempts, the program will provide a message and eventually exit the calculator.

- After performing a calculation or if the user chooses to exit, they are presented with a menu again to either continue or exit the application.

Out Put:

```
1. Addition (+)
2. Subtraction (-)
3. Multiplication (*)
4. Division (/)
Enter Your Choice (1-4): 1

Enter First Number: 5
Enter Second Number: 6

Result: 5.0+6.0 = 11.0

1. Continue
2. Exit

Enter Your Choice (1-2): 1

1. Addition (+)
2. Subtraction (-)
3. Multiplication (*)
4. Division (/)
Enter Your Choice (1-4): 2

Enter First Number: 6
Enter Second Number: 4

Result: 6.0-4.0 = 2.0

1. Continue
2. Exit

Enter Your Choice (1-2): 1

1. Addition (+)
2. Subtraction (-)
3. Multiplication (*)
4. Division (/)
Enter Your Choice (1-4): 3

Enter First Number: 8
Enter Second Number: 3

Result: 8.0*3.0 = 24.0

1. Continue
2. Exit

Enter Your Choice (1-2): 1

1. Addition (+)
2. Subtraction (-)
3. Multiplication (*)
4. Division (/)
Enter Your Choice (1-4): 4

Enter First Number: 8
Enter Second Number: 2

Result: 8.0/2.0 = 4.0

1. Continue
2. Exit

Enter Your Choice (1-2): 2

Good Bye!! Have a nice day
```