Name: Khushi Satyaprakash Singh
Branch: Information Technology
Div: B
Roll number: 45
Batch: [B-2]

Assignment Number :01

```
import java.util.Scanner;

public class ComplexOperations {
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);
      int real1, real2, imag1, imag2;
      int realResult = 0, imagResult = 0;
      int choice;

      System.out.print("Enter real part of 1st complex number: ");
      real1 = scanner.nextInt();
      System.out.print("Enter imaginary part of 1st complex number: ");
      imag1 = scanner.nextInt();
      System.out.print("Enter real part of 2nd complex number: ");
      real2 = scanner.nextInt();
      System.out.print("Enter imaginary part of 2nd complex number: ");
      imag2 = scanner.nextInt();

      System.out.println("Operation list:\n1. ADDITION\n2. SUBTRACTION\n3.
MULTIPLICATION\n4. DIVISION");
      choice = scanner.nextInt();

      switch (choice) {
         case 1: // Addition
            realResult = real1 + real2;
            imagResult = imag1 + imag2;
            System.out.printf("Addition: (%d + %di) + (%d + %di) = (%d + %di)\n", real1,
imag1, real2, imag2, realResult, imagResult);
            break;

         case 2: // Subtraction
            realResult = real1 - real2;
            imagResult = imag1 - imag2;
```

```
            System.out.printf("Subtraction: (%d + %di) - (%d + %di) = (%d + %di)\n", real1,
imag1, real2, imag2, realResult, imagResult);
            break;

         case 3: // Multiplication
            realResult = (real1 * real2) - (imag1 * imag2);
            imagResult = (real1 * imag2) + (real2 * imag1);
            System.out.printf("Multiplication: (%d + %di) x (%d + %di) = (%d + %di)\n", real1,
imag1, real2, imag2, realResult, imagResult);
            break;

         case 4: // Division (assumes simple division; real implementations would involve
conjugates)
            if (real2 != 0 && imag2 != 0) {
               realResult = real1 / real2;
               imagResult = imag1 / imag2;
               System.out.printf("Division: (%d + %di) / (%d + %di) = (%d + %di)\n", real1,
imag1, real2, imag2, realResult, imagResult);
            } else {
               System.out.println("Division by zero is not allowed.");
            }
            break;

         default:
            System.out.println("Invalid choice!");
            break;
      }
   }
}
```

Output:

```
Enter real part of 1st complex number: 2
Enter imaginary part of 1st complex number: 3
Enter real part of 2nd complex number: 1
 Enter imaginary part of 2nd complex number: 4
Operation list:
1. ADDITION
2. SUBTRACTION
3. MULTIPLICATION
4. DIVISION
Addition: (2 + 3i) + (1 + 4i) = (3 + 7i)
Subtraction: (2 + 3i) - (1 + 4i) = (1 - 1i)
Multiplication: (2 + 3i) x (1 + 4i) = (-10 + 11i)
Division: (2 + 3i) / (1 + 4i) = (2 + 0i)
```