ASSIGNMENT 2

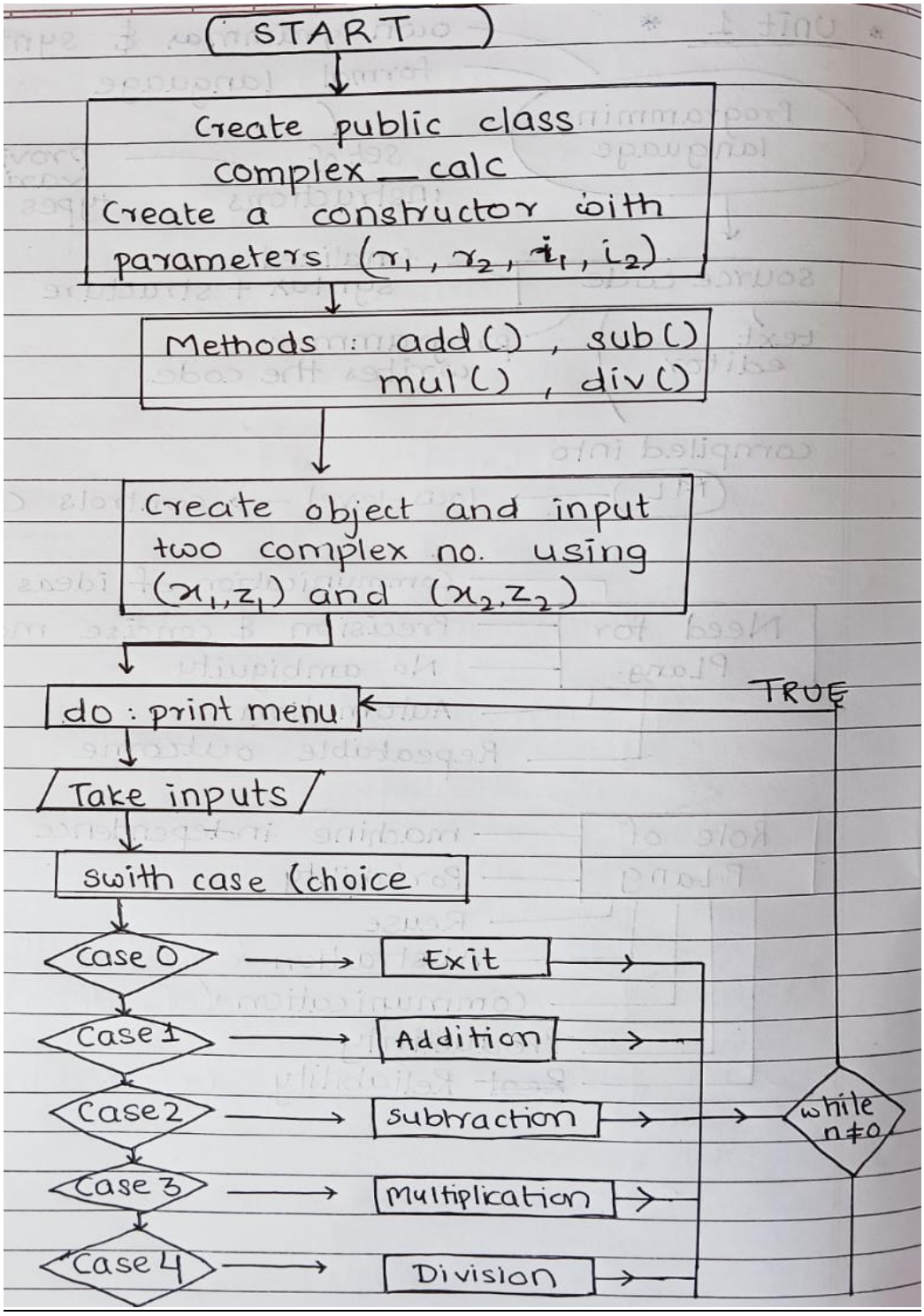
Java Program: (Menu-driven) Input Complex Numbers from User and Perform Arithmetic Operations

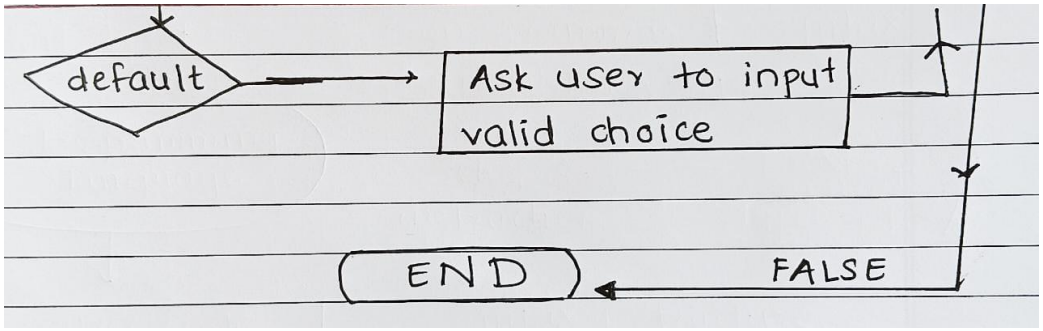
0. Exit
1. Addition of numbers
2. Subtraction of second number from first number
3. Multiplication of numbers
4. Division of first number by second number

Algorithm:

1. Import scanner and create 4 variables for real (a, b) and imaginary (c, d) parts of the 2 complex numbers on which the operations are to be performed.
2. Create a constructor complex_calc with 4 parameters (r1, r2, i1, i2).
3. Create methods for all the operations before the main method.
4. The add() method for addition, sub() for subtraction, mul() for multiplication and div() for division.
5. Inside the main method accept the four inputs (x1, z1 for first number and x2, z2 for second number) using scanner.
6. Display the menu with print statement and call each method from the complex_calc class using the object.

Flowchart:


START
Create public class complex_calc
Create a constructor with parameters (r1, r2, i1, i2)
Methods : add(), sub()
mul(), div()
Create object and input two complex no. using (x1,z1) and (x2,z2)
do : print menu
TRUE
Take inputs
swith case (choice
Case 0
Exit
Case 1
Addition
Case 2
subtraction
Case 3
Multiplication
Case 4
Division
while n≠0


default
Ask user to input valid choice
END
FALSE

Code:

```
package Asngmt2;

import java.util.*;
import java.util.Scanner;

public class complex_calc
{
	double a,b,c,d;

	complex_calc(double r1, double r2, double i1, double i2)
	{
		a = r1;
		b = i1;
		c = r2;
		d = i2;
	}

	public void add()
	{
		double addreal = a + c;
		double addcom = b + d;
	 System.out.println("The sum total is " +addreal+ " + " +addcom+"
i.");

	}

	public void sub()
	{
		double subreal = a - c;
		double subcom = b - d;
	 System.out.println("The difference is " +subreal+ " + " +subcom+"
i.");

	}

	public void mul()
	{
		 double mulreal = (a*c)-(b*d);
		 double mulcom = (a*d)-(b*c);
		 System.out.println("The product is " +mulreal+ " + " +mulcom+"
i.");

	}

	public void div()
	{
		double divreal = (a*c)+(b*d);
		double divcomp = (b*c)-(a*d);
		double denom = (c*c)+(d*d);
		double p1 = divreal / denom;
		double p2 = divcomp / denom;
	 System.out.println("The quotient is " +p1+ " + " +p2+ " i.");

	}

	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
```

```
            double x1, x2, z1, z2;
             System.out.println("Enter real part of the first number");
             x1 = sc.nextInt();
             System.out.println("Enter complex part of the first number");
             z1 = sc.nextInt();
             System.out.println("Enter real part of the second number");
             x2 = sc.nextInt();
             System.out.println("Enter complex part of the second number");
             z2 = sc.nextInt();

             complex_calc obj = new complex_calc(x1, x2, z1, z2);

             int choice;

             do {
                   System.out.println("Choose the operation you want to
perform");
                   System.out.println("0. Exit");
                   System.out.println("1. Addition of numbers");
                   System.out.println("2. Subtraction of second number from
first number");
                   System.out.println("3. Multiplication of numbers");
                   System.out.println("4. Division of first number by
second number");


                   choice = sc.nextInt();

                   switch (choice)
                   {
                   case 0:
                         System.out.println("Goodbye and Have a great
day!");
                         break;

                   case 1:
                         obj.add();
                         break;

                   case 2:
                         obj.sub();
                         break;

                   case 3:
                         obj.mul();
                         break;

                   case 4:
                         obj.div();
                         break;

                   default:
                         System.out.println("Enter a valid option");
                  }

      }
             while (choice != 0);
             }

}
```

Output:

```
Enter real part of the first number
22
Enter complex part of the first number
33
Enter real part of the second number
44
Enter complex part of the second number
11
Choose the operation you want to perform
0. Exit
1. Addition of numbers
2. Subtraction of second number from first number
3. Multiplication of numbers
4. Division of first number by second number
1
The sum total is 66.0 + 44.0 i.
Choose the operation you want to perform
0. Exit
1. Addition of numbers
2. Subtraction of second number from first number
3. Multiplication of numbers
4. Division of first number by second number
2
The difference is -22.0 + 22.0 i.
Choose the operation you want to perform
0. Exit
1. Addition of numbers
2. Subtraction of second number from first number
3. Multiplication of numbers
4. Division of first number by second number
3
The product is 605.0 + -1210.0 i.
Choose the operation you want to perform
0. Exit
1. Addition of numbers
2. Subtraction of second number from first number
3. Multiplication of numbers
4. Division of first number by second number
4
The quotient is 0.6470588235294118 + 0.5882352941176471 i.
Choose the operation you want to perform
0. Exit
1. Addition of numbers
2. Subtraction of second number from first number
3. Multiplication of numbers
4. Division of first number by second number
6
Enter a valid option
Choose the operation you want to perform
0. Exit
1. Addition of numbers
2. Subtraction of second number from first number
3. Multiplication of numbers
4. Division of first number by second number
0
Goodbye and Have a great day!
```