JAVA IOT DEVELOPER LAB

LAB -1

SUBMITTED BY:

AYUSH KUMAR JHA

SAP ID - 500086400

Enrollment no - R200220083

B.C.A -I.O.T.

SUBMITTED TO:

SURBHI SARASWAT Ma’am

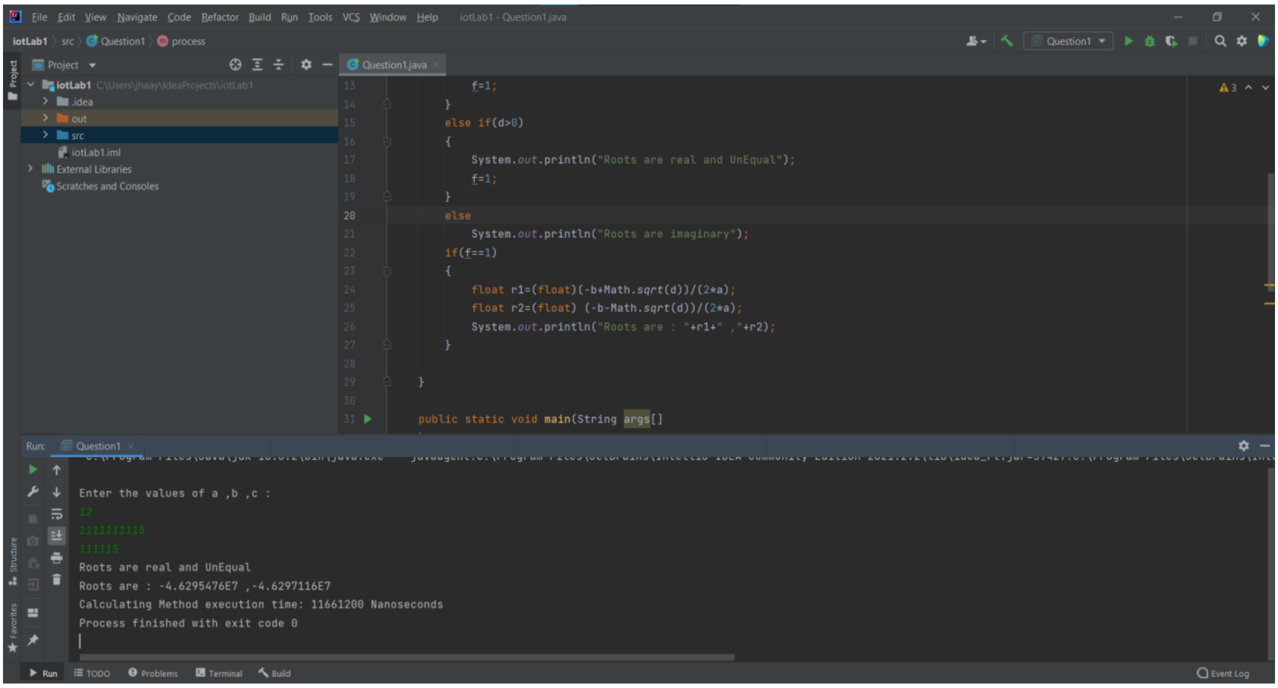
Questions :-

1. Read in a,b, c and use the quadratic formula to calculate roots of the quadratic equation. Printsall real solutions or display a message stating that there are no real solutions. Also, calculate timetaken for executing the code.

Sol.

```
import java.util.*;
public class Question1 {
  public void display(long end , long start) {
    System.out.printf("Calculating Method execution time: %d Nanoseconds",(end - start));
  }
  public void process(int a, int b, int c){
    int d,f=0;
    d=(b*b)-(4*a*c);
    if(d==0)
    {
      System.out.println("Roots are real and Equal");
      f=1;
    }
    else if(d>0)
    {
      System.out.println("Roots are real and UnEqual");
      f=1;
    }
    else
      System.out.println("Roots are imaginary");
    if(f==1)
    {
      float r1=(float)(-b+Math.sqrt(d))/(2*a);
      float r2=(float) (-b-Math.sqrt(d))/(2*a);
      System.out.println("Roots are : "+r1+" ,"+r2);
    }

  }
```

```
    public static void main(String args[]
    )
    {
        int a,b,c,d,f=0;
        Scanner scr=new Scanner(System.in);
        System.out.println("\nEnter the values of a ,b ,c : ");
        a=scr.nextInt();
        b=scr.nextInt();
        c=scr.nextInt();

        long start = System.nanoTime();


        Question1 obj = new Question1();
        obj.process(a,b,c);
        long end = System.nanoTime();
        obj.display(end, start);
    }
}
```



File Edit View Navigate Code Refactor Build Run Tools VCS Window Help
iotLab1 - Question1.java
iotLab1 src Question1 process
Project
iotLab1 C:\Users\jhaay\IdeaProjects\iotLab1
.idea
out
src
iotLab1.iml
External Libraries
Scratches and Consoles
Question1.java
Run: Question1
Run TODO Problems Terminal Build
Event Log

```
                f=1;
            }
            else if(d>0)
            {
                System.out.println("Roots are real and UnEqual");
                f=1;
            }
            else
                System.out.println("Roots are imaginary");
            if(f==1)
            {
                float r1=(float)(-b+Math.sqrt(d))/(2*a);
                float r2=(float) (-b-Math.sqrt(d))/(2*a);
                System.out.println("Roots are : "+r1+" ,"+r2);
            }

        }

        public static void main(String args[]
```

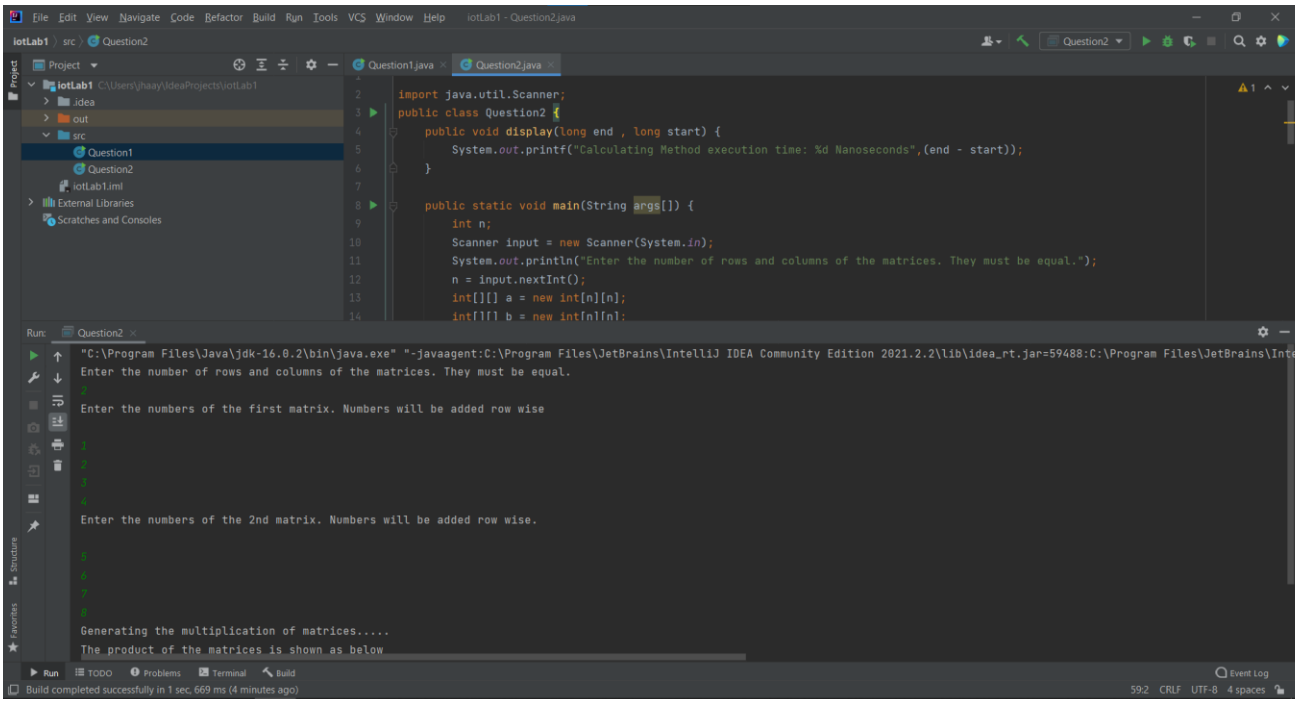
```
Enter the values of a ,b ,c :
12
1111111115
111115
Roots are real and UnEqual
Roots are : -4.6295476E7 ,-4.6297116E7
Calculating Method execution time: 11661200 Nanoseconds
Process finished with exit code 0
```

2. . Read the order and elements of two 2-D matrices. Calculate the multiplication of those twomatrices. Also, calculate time taken for executing the code.

Sol.

```
import java.util.Scanner;
public class Question2 {
  public void display(long end , long start) {
    System.out.printf("Calculating Method execution time: %d Nanoseconds",(end - start));
  }

  public static void main(String args[]) {
    int n;
    Scanner input = new Scanner(System.in);
    System.out.println("Enter the number of rows and columns of the matrices. They must be equal.");
    n = input.nextInt();
    int[][] a = new int[n][n];
    int[][] b = new int[n][n];
    int[][] c = new int[n][n];
    System.out.println("Enter the numbers of the first matrix. Numbers will be added row wise \n");
    for (int i = 0; i < n; i++)
    {
      for (int j = 0; j < n; j++)
      {
        a[i][j] = input.nextInt();
      }
    }
    System.out.println("Enter the numbers of the Second matrix. Numbers will be added row wise. \n");
    for (int i = 0; i < n; i++)
    {
      for (int j = 0; j < n; j++)
      {
        b[i][j] = input.nextInt();
      }
    }
    long start = System.nanoTime();
    System.out.println("Generating the multiplication of matrices.....");
    for (int i = 0; i < n; i++)
    {
      for (int j = 0; j < n; j++)
      {
        for (int k = 0; k < n; k++)
        {
          c[i][j] = c[i][j] + a[i][k] * b[k][j];
        }
      }
    }
```

```
        System.out.println("The product of the matrices is shown as below");
        for (int i = 0; i < n; i++)
        {
            for (int j = 0; j < n; j++)
            {
                System.out.print(c[i][j] + " ");
            }
            System.out.println();
        }
        input.close();
        Question2 obj = new Question2();

        long end = System.nanoTime();
        obj.display(end , start);
    }
}
```



```
import java.util.Scanner;
public class Question2 {
    public void display(long end , long start) {
        System.out.printf("Calculating Method execution time: %d Nanoseconds",(end - start));
    }

    public static void main(String args[]) {
        int n;
        Scanner input = new Scanner(System.in);
        System.out.println("Enter the number of rows and columns of the matrices. They must be equal.");
        n = input.nextInt();
        int[][] a = new int[n][n];
        int[][] b = new int[n][n];
```

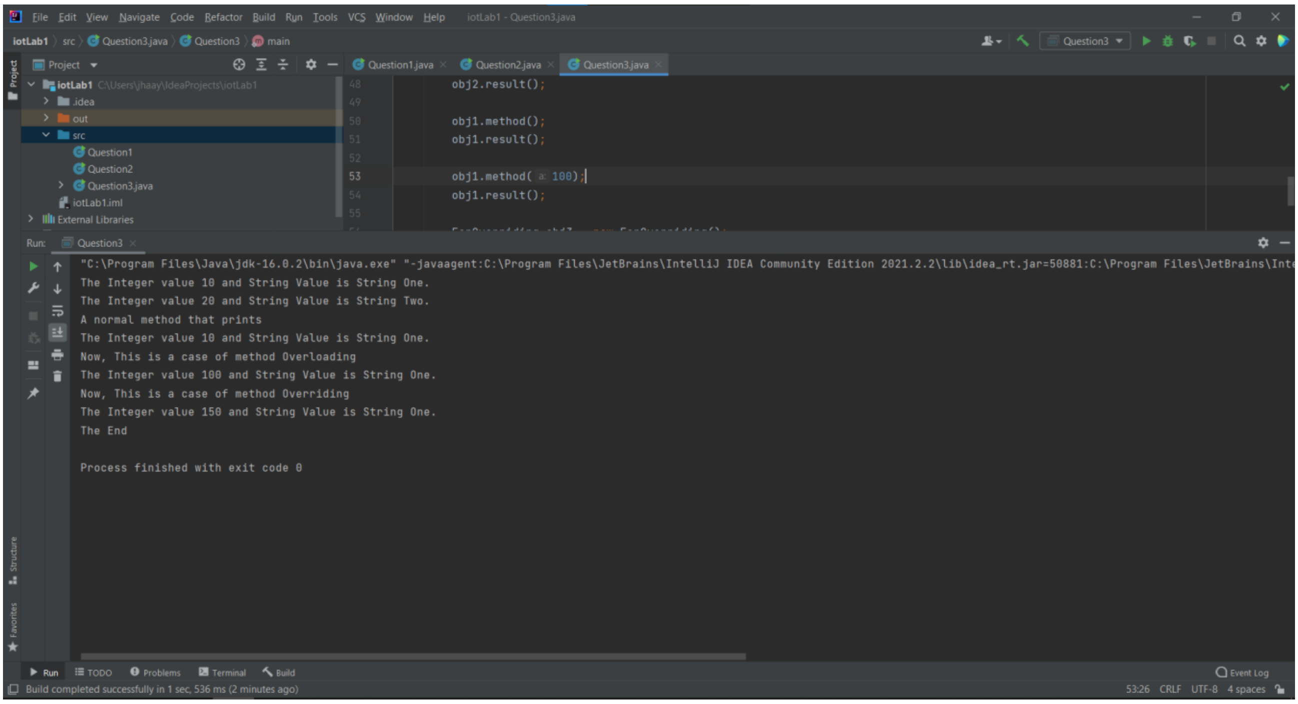
```
"C:\Program Files\Java\jdk-16.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.2\lib\idea_rt.jar=59488:C:\Program Files\JetBrains\Inte
Enter the number of rows and columns of the matrices. They must be equal.
2
Enter the numbers of the first matrix. Numbers will be added row wise


1
2
3
4
Enter the numbers of the 2nd matrix. Numbers will be added row wise.


5
6
7
8
Generating the multiplication of matrices.....
The product of the matrices is shown as below
```

Build completed successfully in 1 sec, 669 ms (4 minutes ago)

3. Write a java program to implement method overloading, method overriding, and constructorsoverloading.

Sol.

```
class ForQuestion{
    int number1;
    String value;

    ForQuestion(){
        this.number1= 10;
        this.value="String One";
    }
    //   Constructor Overloading

    ForQuestion(int num , String val){
        this.number1= num;
        this.value=val;
    }
    void result (){
        System.out.printf("The Integer value %d and String Value is %s.\n",number1,value);
    }
    void method(){
        System.out.println("A normal method that prints");
    }
    //   Method Overloading
    void method(int a){
        this.number1= a;
        System.out.println("Now, This is a case of method Overloading");
    }
}

class ForOverriding extends ForQuestion{
    //   Method Overriding
    void method(int a){
        this.number1= a;
        System.out.println("Now, This is a case of method Overriding");
    }
    void result(){
        super.result();
        System.out.println("The End");
    }
}

public class Question3 {
    public static void main(String[] args) {
        ForQuestion obj1 = new ForQuestion();
        int num = 20;
        String val ="String Two";
        ForQuestion obj2 = new ForQuestion(num , val);

        obj1.result();
        obj2.result();

        obj1.method();
        obj1.result();

        obj1.method(100);
        obj1.result();

        ForOverriding obj3 = new ForOverriding();
        obj3.method(150);
        obj3.result();

    }
}
```


File Edit View Navigate Code Refactor Build Run Tools VCS Window Help iotLab1 - Question3.java
iotLab1 〉 src 〉 Question3.java 〉 Question3 〉 main
Question3
Project
iotLab1 C:\Users\jhaay\IdeaProjects\iotLab1
.idea
out
src
Question1
Question2
Question3.java
iotLab1.iml
External Libraries
Question1.java
Question2.java
Question3.java
Run: Question3
Run
TODO
Problems
Terminal
Build
Event Log
Structure
Favorites
53:26 CRLF UTF-8 4 spaces

```
        obj2.result();

        obj1.method();
        obj1.result();

        obj1.method( a: 100);
        obj1.result();
```

```
"C:\Program Files\Java\jdk-16.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.2\lib\idea_rt.jar=50881:C:\Program Files\JetBrains\Inte
The Integer value 10 and String Value is String One.
The Integer value 20 and String Value is String Two.
A normal method that prints
The Integer value 10 and String Value is String One.
Now, This is a case of method Overloading
The Integer value 100 and String Value is String One.
Now, This is a case of method Overriding
The Integer value 150 and String Value is String One.
The End

Process finished with exit code 0
```

Build completed successfully in 1 sec, 536 ms (2 minutes ago)