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LAB (week 3).

→ (1) Quadratic eqn program.

```
public class Main {
    public static void main(String args[]) {
        double r1, r2;
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter a, b, c value: \t");
        double a = sc.nextDouble();
        double b = sc.nextDouble();
        double c = sc.nextDouble();
        double d = b*b - 4*a*c;
        if (D<0 {
            System.out.println("Imaginary rut: " + (-b/2*a) + "+" + "-" + (Math.sqrt(-D)/2*a) + "i");
```

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```
System.out.println("Imaginary root2: "+
        (-b/2*a)+"-("-q)+Math.sqrt((-D)/2*a)
        +"i");
} else {
r1 = (-b + Math.sqrt(D))/2*a;
r2 = (-b - Math.sqrt(D))/2*a;
System.out.println("real root 1: "+r1);
System.out.println("real root2: "+r2);
}
}
}
```

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BASIC ALGO / LOGIC

- Quadratic determinant : $b^2 - 4ac$

where a, b, c are variables.

$ax^2 + bx + c$

INPUT (a, b, c)

$b^2 - 4ac = D$

D<0 D>0

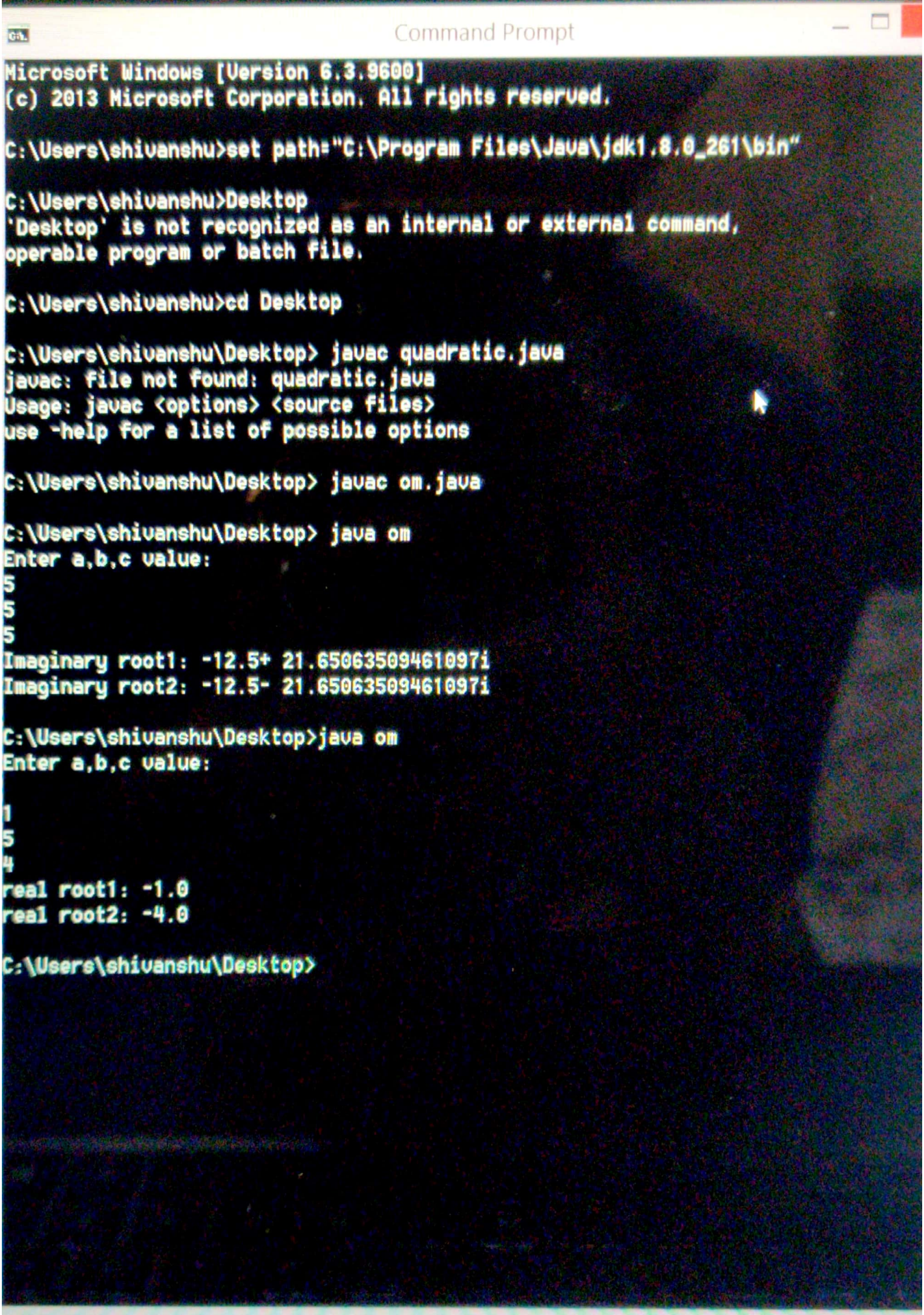
$\frac{-b \pm \sqrt{-D}}{2a}$ = (some form of fraction)

$\frac{-b + \sqrt{D}}{2a}$ (direct value) = some value

OUTPUT a b c

5
5
5
Imaginary root1 - 12.5 + 21.65
Imaginary root2 - 12.5 - 21.65

1
5
4
real root1 : -1.0
real root2 : -4.0



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(2) SGPA PROGRAM :-

```
import java.util.scanner.
class Student
{ private String USN;
  private String name;
  private int n;
  private double SGPA = 0;
  private int total credits = 0;
Scanner ss = new Scanner (system.in);
void Details()
{ system.out.println ("Enter USN of student");
  USN = ss.nextline();
  system.out.println ("Enter name");
  name = ss.nextline();
  system.out.println ("Enter no of subjects");
  n = ss.nextInt();
  int credits[] = new int [n];
```

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// to show how many times u take data Page No. .....

```
double marks[] = new double[n];
System.out.println("Enter details of sub");
for(int i=0; i<n; i++)
{ System.out.println("Enter credits allotted to sub"
    +(i+1));
  marks[i] = ss.nextInt();
  Calculate(credits[i], marks[i], i);
}}

void Calculate(int credits, double marks, int j)
{ totalCredits = totalcrits + credit;
  if (mark >= 90 && mark <= 100)
      SGPA = SGPA + (10 * credit);
  else if (mark >= 80 && mark <= 89)
      SGPA = SGPA + (9 * credit)
  else if (mark >= 70 && mark <= 79)
      SGPA = SGPA + (8 * credit)
```

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```
else if (marks>=60 && mark<=69)
    SGPA = SGPA + (7 * credits)

else if (marks>=50 && mark<=59)
    SGPA = SGPA + (6 * credits)

else if (marks>=40 && mark<=49)
    SGPA = SGPA + (5 * credits)

else
System.out.println("Failed subject"+(j+1));
}

void Display()
{ system.out.println("Name: "+name);
  system.out.println("USN: "+USN);
  system.out.println("SGPA of student"+
        (SGPA/totalcredits));
```

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```
class Main
{ public static void main (String args[])
  {
    student s1 = new Student();
    s1.Details();   // similar to
    s1.Display();   calling function
  }
}
```

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Output

Enter USN of student
151

Enter name of student
Shivanshu P

Enter no of subj
3

Credits alloted to sub 1
5

Enter mark in sub 1
80

Credits alloted to sub 2
4

Enter marks in sub 2
75

Enter credits alloted to sub 3
4

Enter marks in sub 3
72

Details of student
Name: Shivanshu P
USN : 151
SGPA : 8.3846

basic Algo logic for input

: name ——
USN ——
~~marks~~ subj — n

mark [i] - - - mark [<= n]
credits [i] - - - cred [<= n]

basic logic of program : marks [0+]

↓

marks [<= n]

↓ using if-else cond

total ~~mark~~ SGPA

= (SGPA + 'x' * credit)

↓

SGPA = total SGPA / total credits

'x' ⇒ Grade Point

10 - S or else fail.

depending on if-else

```
C:\Users\shivanshu\Desktop> java 1ab
Enter USN of the student
151
Enter Name of the student
shivanshu p
Enter no of subjects
6
Enter details of the subjects:
Enter credits allotted to the subject 1
5
Enter marks in the subject 1
80
Enter credits allotted to the subject 2
4
Enter marks in the subject 2
75
Enter credits allotted to the subject 3
4
Enter marks in the subject 3
72
Enter credits allotted to the subject 4
3
Enter marks in the subject 4
71
Enter credits allotted to the subject 5
1
Enter marks in the subject 5
90
Enter credits allotted to the subject 6
4
Enter marks in the subject 6
80
Details of the Student
Name :shivanshu p
USN: 151
SGPA of student 8.523809523809524

C:\Users\shivanshu\Desktop>
```