Algorithm for Java Program Roots

step-1: Create a class named Roots.

step-2: Create an object ss of scanner class which is defined in java.util.scanner Package.

step-3: Declare a, b, c, r_1, r_2 and del.

step-4: Input a, b, c from the user.

step-5: SET del = (b*b - 4*a*c).

step-6: IF a == 0

PRINT a cannot be equal to zero.

EXIT.

ELSE

PRINT a is a real value.

step-7: IF del == 0

SET $r_1 = -b/2a$ and $r_2 = -b/2a$

PRINT Roots are r_1, r_2.

ELSE IF del > 0

~~SF~~

PRINT Roots are real and ~~equal~~ unequal.

SET r_1 = -b + sqrt(del)/2*a.

SET r_2 = -b - sqrt(del)/2*a.

PRINT Roots are r_1, r_2.

ELSE

PRINT There are no Real solutions.

Java Program for Roots

```
import java.util.Scanner;
import java.lang.*;
class Roots
{
 Public static void main (string args[])
 {
  double a,b,c, r1, r2, del;
  Scanner ss = new Scanner (System.in);
  System.out.Println("\n Enter the values of
    a,b,c for a quadratic equation : \n");
  a = ss.nextDouble();
  b = ss.nextDouble();
  c = ss.nextDouble();
  del = (b*b-4*a*c);
  if(a==0)
  {
   System.out.Println("\n a cannot be equal to
   } system.exit(0);                zero\n");
  else
  {
   system.out.Println("a is a real value\n");
  }
  if (del==0)
  {
   system.out.Println("Roots are real and equal\n");
    r1 = -(b/(2**a));
    r2 = -(b/(2*a));
   system.out.Println("Roots are : \n"+r1+" "+r2);
}
```

```
else if (del>0)
{
 system.out.Println("Roots are real and unequal\n");
  r1=(-b+Math.sqrt(del))/(2*a);
  r2=(-b-Math.sqrt(del))/(2*a);
  system.out.Println("Roots are :\n"+r1+";"+r2);
 }
 else
 {
  system.out.Println("there are no Real solutions\n");
 }
}
}
```

output

Enter the values of a, b, c for quadratic equatio
: 1 -4 4
a is a real value.
Roots are real and equal.
Roots are 2.0, 2.0

Enter the values of a, b, c for quadratic equatio
: 1 5 6
a is a real value.
Roots are real and unequal.
Roots are -3.0, -2.0

Enter the values of a, b, c for quadratic equatio
: 2 1 3
a is a real value.
There are no real solutions.