

```
//CHAPTER 4 PROGRAMMING EXERCISE 7
// This program is used to find the roots of a
quadratic equation, making use of the Discriminant (D).
```

```
#include <iostream>
#include <cmath>
```

```
using namespace std;
```

```
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```

```
int main()
{
```

```
// the letter "D" assigned to the variable double
represent the Discriminant
```

```
    int a;
    int b;
    int c;
    double D;
    double R1;
    double R2;
```

```
//input values for a, b, and c where a represents the
coefficient of  $x^2$ , b represents the coefficient of x
and
```

```
// c is the constant term
```

```
    cout << " Input value of a: ";
    cin >> a;
```

```
    cout << " Input value of b: ";
    cin >> b;
```

```
    cout << " Input value of c: ";
    cin >> c;
```

```
// The power(pow) function and square root(sqrt)
function are been used for the general formula
```

```
D = (pow(b, 2.0) - (4 * a * c));
R1 = (- b + sqrt(D)) / (2 * a);
R2 = (- b - sqrt(D)) / (2 * a);
```

```
//Make use of the if and else statements to determine
if the value of the Discriminant(D) is equal to, less
than,
//greater than zero.
```

```
    if (D == 0)
    {
        cout << " The equation has a single (repeated)
root, the Discriminant = " << D << endl;
        cout << " The two roots R1 and R2 = " << R1 <<
endl;
    }

    else if (D > 0)
    {
        cout << " The equation has two real roots, the
Discriminant = " << D << endl;
        cout << " The first root R1 = " << R1 << endl;
        cout << " The second root R2 = " << R2 << endl;
    }

    else if (D < 0)
    {
        cout << " The equation has two complex roots,
the Discriminant = " << D << endl;
        cout << " The first root R1 = " << R1 << endl;
        cout << " The second root R2 = " << R2 << endl;
    }

return 0;

}
```

