

**// 4. write a program to find the root of quadratic equation.**

```
#include <stdio.h>
#include <math.h>

int main() {
    double a, b, c, discriminant, root1, root2, realPart, imagPart;

    // Input coefficients
    printf("Enter coefficients a, b and c: ");
    scanf("%lf %lf %lf", &a, &b, &c);

    // Calculate discriminant
    discriminant = b * b - 4 * a * c;

    // Check the nature of the roots
    if (discriminant > 0) {
        // Two real and distinct roots
        root1 = (-b + sqrt(discriminant)) / (2 * a);
        root2 = (-b - sqrt(discriminant)) / (2 * a);
        printf("Roots are real and distinct:\n");
        printf("Root 1 = %.2lf\n", root1);
        printf("Root 2 = %.2lf\n", root2);
    }
    else if (discriminant == 0) {
        // Two real and equal roots
        root1 = root2 = -b / (2 * a);
        printf("Roots are real and equal:\n");
        printf("Root = %.2lf\n", root1);
    }
    else {
        // Complex roots
        realPart = -b / (2 * a);
        imagPart = sqrt(-discriminant) / (2 * a);
        printf("Roots are complex and imaginary:\n");
        printf("Root 1 = %.2lf + %.2lfi\n", realPart, imagPart);
        printf("Root 2 = %.2lf - %.2lfi\n", realPart, imagPart);
    }

    return 0;
}
```

**Output :**

```
● aryankamboj@users-MacBook-Air lab_submission_2 % cd "/Users/aryankamboj/Desktop/c_programming_theory/untitled folder/lab_submission_2/" && gcc Q_root.c -o Q_root && "/Users/aryankamboj/Desktop/c_programming_theory/untitled folder/lab_submission_2/"Q_root
Enter coefficients a, b and c: 1 5 6
Roots are real and distinct:
Root 1 = -2.00
Root 2 = -3.00
```