SRM

INSTITUTE OF SCIENCE & TECHNOLOGY

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PROJECT TITLE – Quadratic Equation Calculator

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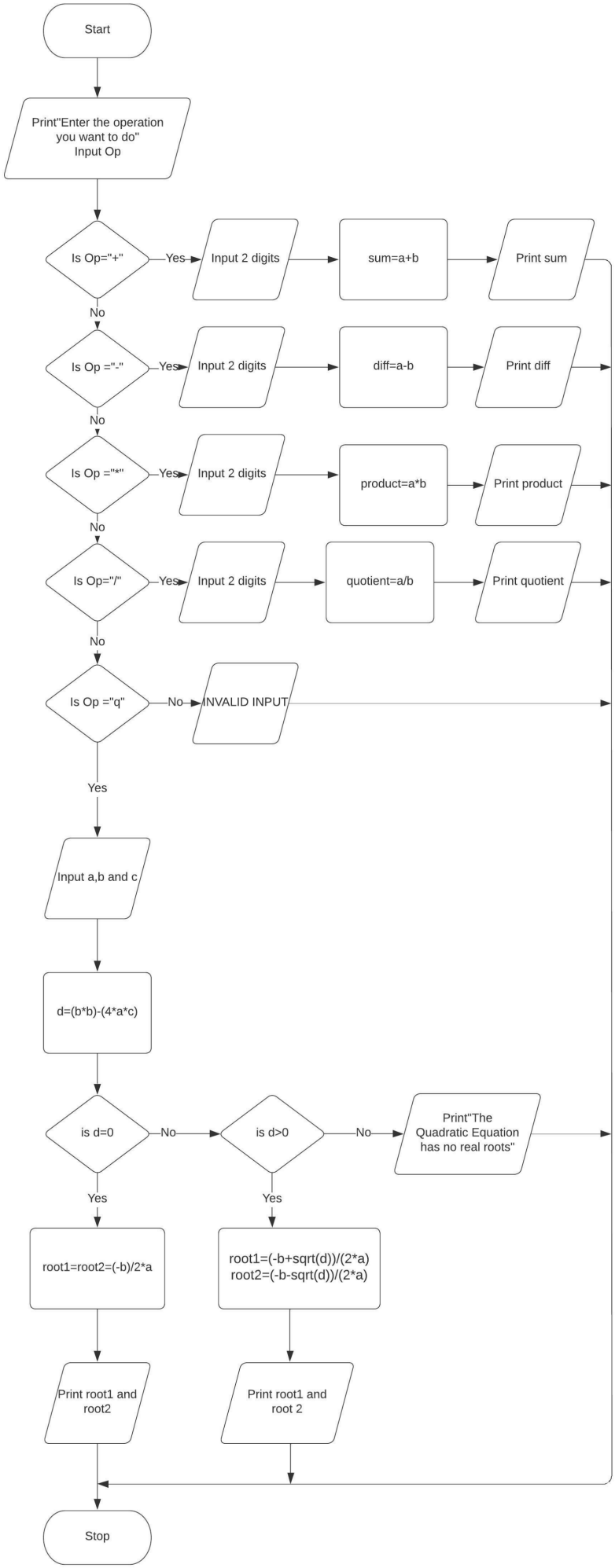
ABSRACT – Quadratic equations are one of the most important and basic things in mathematics. It is required to solve sums is especially required in engineering first year maths course. The following is a C program to calculate the roots of any quadratic equation. The discriminant method is used to give accurate results up to the last decimal. This program has real world application as it can be used at any time to give accurate results for any sum.

FLOW CHART


Start
Print"Enter the operation you want to do"
Input Op
Is Op="+"
Yes
Input 2 digits
sum=a+b
Print sum
No
Is Op ="-"
Yes
Input 2 digits
diff=a-b
Print diff
No
Is Op ="*"
Yes
Input 2 digits
product=a*b
Print product
No
Is Op="/"
Yes
Input 2 digits
quotient=a/b
Print quotient
No
Is Op ="q"
No
INVALID INPUT
Yes
Input a,b and c
d=(b*b)-(4*a*c)
is d=0
No
is d>0
No
Print"The Quadratic Equation has no real roots"
Yes
Yes
root1=root2=(-b)/2*a
root1=(-b+sqrt(d))/(2*a)
root2=(-b-sqrt(d))/(2*a)
Print root1 and root2
Print root1 and root 2
Stop

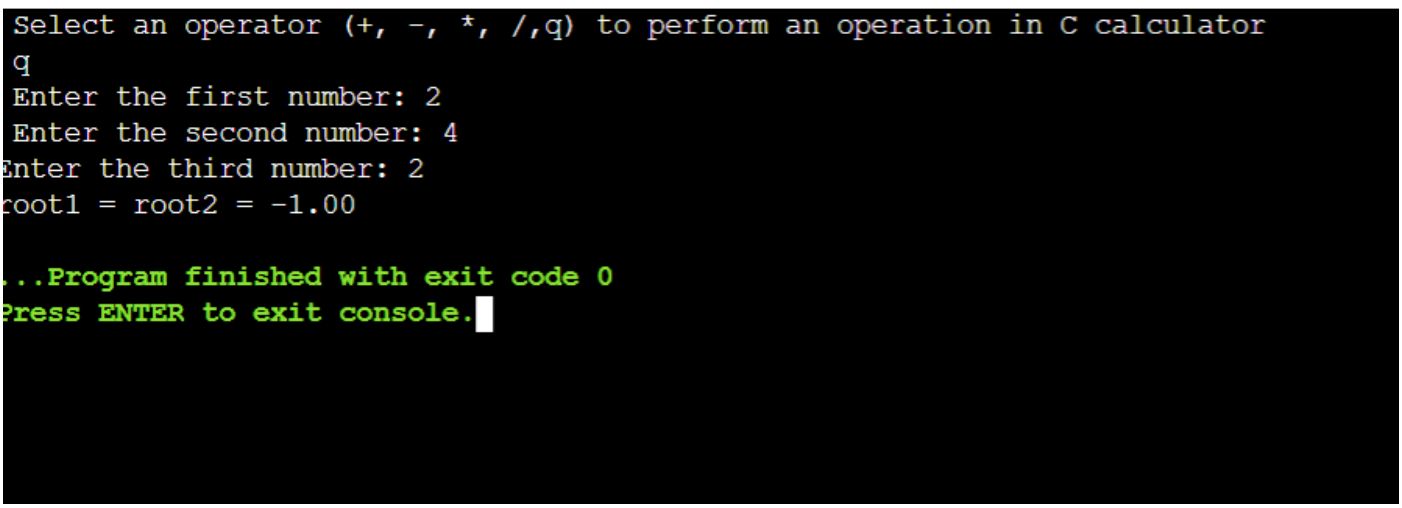
PROGRAM -

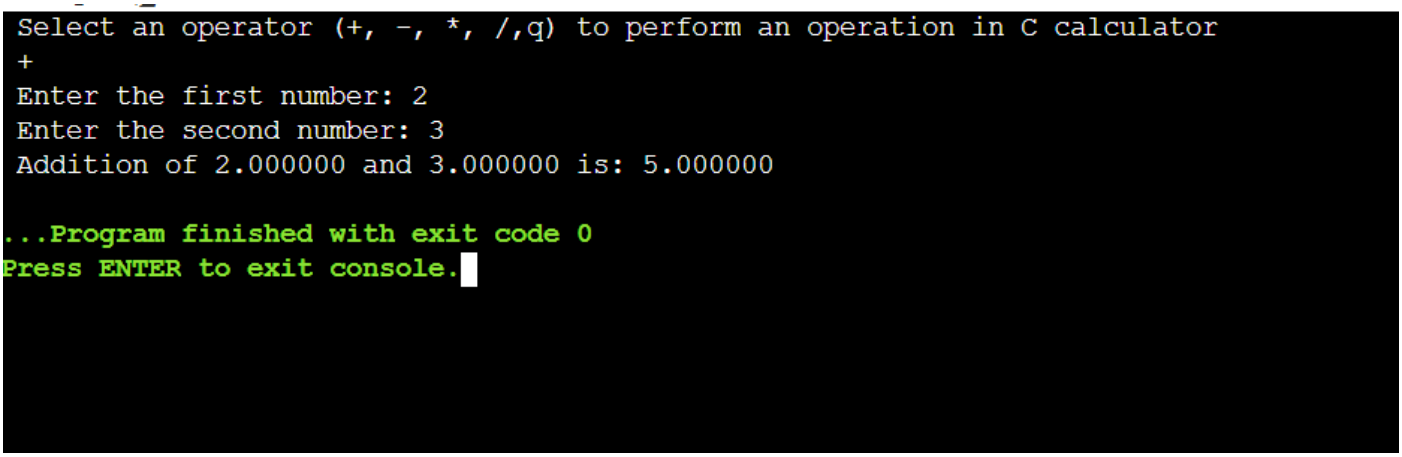
```c
#include <stdio.h>
#include<math.h>
int main()
{
    // declare local variables
    char opt;
    double n1,n2,n3,discriminant, root1, root2;
    float res;
    printf ("Select an operator (+, -, *, /,q) to perform an operation in C calculator
\n");
    scanf ("%c", &opt); // take an operator
    printf ("Enter the first number:");
    scanf("%lf", &n1); // take fist number
    printf ("Enter the second number:");
    scanf ("%lf", &n2); // take second number
    {
        if (opt == '+')
        {
            res = n1 + n2; // add two numbers
            printf ("Addition of %lf and %lf is:%f", n1, n2, res);
        }

        else if (opt == '-')
        {
            res = n1 - n2; // subtract two numbers
            printf ("Subtraction of %lf and %lf is:%f", n1, n2, res);
        }

        else if (opt == '*')
        {
            res = n1 * n2; // multiply two numbers
            printf ("Multiplication of %lf and %lf is:%f", n1, n2, res);
        }

        else if (opt == '/')
        {
            if (n2 == 0)   // if n2 == 0, take another number
            {
                printf ("\nDivisor cannot be zero.\n Please enter another value:");
                scanf ("%lf", &n2);
            }
            res = n1 / n2; // divide two numbers
            printf ("Division of %lf and %lf is:%.2f", n1, n2, res);
        }
        else if(opt == 'q')
        {
```

```
            printf("Enter the third number:");
            scanf("%lf",&n3);
            discriminant = n2 * n2 - 4 * n1 * n3;
            if (discriminant > 0) {
                root1 = (-n2 + sqrt(discriminant)) / (2 * n1);
                root2 = (-n2 - sqrt(discriminant)) / (2 * n1);
                printf("The roots are %.2lf and %.2lf", root1, root2);
            }
            else if (discriminant == 0) {
                root1 = root2 = -n2/(2 * n1);
                printf("root1 = root2 = %lf %lf", root1, root2);
            }
            else {
                printf("The quadratic equation has no real roots.");
            }
        }
        else
        {
            printf(" \nYou have entered wrong inputs.");
        }
        return 0;
    }
}
```

RESULTS - Select an operator (+, -, *, /,q) to perform an operation in C calculator
Q
Enter the first number: 2
Enter the second number: 4
Enter the third number: 2
root1 = root2 = -1.00

SCREENSHOTS





RERERENCES

https://www.javatpoint.com/calculator-program-in-c
https://www.programiz.com/c-programming/examples/quadratic-roots