

CECS 524 Unit 2 Assignment 1

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Write a Pascal program that solves quadratic equations for real and imaginary roots.

```
program solve;
var a,b,c:real;
var im:real;
var rl:real;
procedure SolveRoots(a, b,c: real);
begin
    if(b*b-4*a*c>0) then
    begin
        writeln('Roots are real');
        writeln('Root 1:', (-b+sqrt((b*b)-4*a*c))/(2*a));
        writeln('Root 2:', (-b-sqrt((b*b)-4*a*c))/(2*a));
    end

    else if(b*b-4*a*c=0) then
    begin
        writeln('One real root');
        writeln('Root 1:', (-b)/(2*a));
    end

    else if(b*b-4*a*c<0) then
    begin
        writeln('Roots are Imaginary');
        rl:=-b/(2*a);
        im:= sqrt(-(b*b)-4*a*c)/2*a;
        if(b=0) then
        begin
            writeln('Root 1:', '+i*', im);
            writeln('Root 2:', '-i*', im);
        end
        else
        begin
            writeln('Root 1:', rl, '+i*', im);
            writeln('Root 2:', rl, '-i*', im);
        end
    end
end;
begin
```

```

repeat
Writeln('Enter a b c values: ');
Readln(a,b,c);
if (a = 0) and (b = 0) and (c = 0) then
begin
    Writeln('3 equations were solved');
    exit;
end;
SolveRoots(a,b,c);
until a = 0;

```

end.

Output:

The screenshot shows a code editor with a file named 'solve.pas'. The code is a Pascal program that repeatedly prompts the user for three values (a, b, c) and calculates the roots of the quadratic equation $ax^2 + bx + c = 0$. The program handles three cases: real roots, imaginary roots, and the case where all three coefficients are zero.

The terminal window shows the following output:

```

Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\mspur\OneDrive\Desktop\Assignments\APL\Unit 2> ./solve
Enter a b c values:
1 0 -9
Roots are real
Root 1: 3.000000000000000E+000
Root 2: -3.000000000000000E+000
Enter a b c values:
1 6 9
One real root
Root 1: -3.000000000000000E+000
Enter a b c values:
1 0 4
Roots are Imaginary
Root 1: i* 2.000000000000000E+000
Root 2: i*-2.000000000000000E+000
Enter a b c values:
0 0 0
3 equations were solved
PS C:\Users\mspur\OneDrive\Desktop\Assignments\APL\Unit 2> 

```