ENGR 1204 Programming Languages in Engineering

MATLAB Lab 2

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MATLAB Code

```
in = input('Enter a,b and c as a vector. Ex. [1 2 3]: ');
a = in(1); b = in(2); c = in(3);
D = b^2 - 4*a*c;
if D > 0
disp('Two real roots exist')
x1 = (-b + sqrt(D))/(2*a);
x2 = (-b - sqrt(D))/(2*a);
disp('Root 1 ='), disp(x1)
disp('Root 2 ='), disp(x2)
else
if D == 0
disp('Double equal root exists')
x1 = -b/(2*a);
disp('Root ='), disp(x1)
else
disp('Two complex conjugate roots exist')
x1 = (-b + sqrt(D))/(2*a);
x2 = (-b - sqrt(D))/(2*a);
disp('Root 1 ='), disp(x1)
disp('Root 2 ='), disp(x2)
end
end
```

Output

Case 1

a = 1, b = 4, c = 2

```
>> lab2
Enter a,b and c as a vector. Ex. [1 2 3]: [1 4 2]
Two real roots exist
Root 1 =
   -0.5858

Root 2 =
   -3.4142
```

Case 2

a = 1, b = 4, c = 4

```
>> lab2
Enter a,b and c as a vector. Ex. [1 2 3]: [1 4 4]
Double equal root exists
Root =
    -2
```

Case 2

a = 1, b = 4, c = 8

```
>> lab2
Enter a,b and c as a vector. Ex. [1 2 3]: [1 4 8]
Two complex conjugate roots exist
Root 1 =
  -2.0000 + 2.0000i

Root 2 =
  -2.0000 - 2.0000i
```

Conclusion

All the requirements of the lab were met successfully. The developed code for the lab successfully detects and calculates the roots for the given quadratic equation.