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**Experiment Number: 1**

**Title: Finding Quadratic Roots**

**Theory:** Code takes coefficients in the form of variables ‘a’, ‘b’ and ‘c’ where it compares to equation ax²+bx+c=0. Then a function findRoots() is used to find the roots of the equation using quadratic formula on basis of the discriminant of Equation.

**Code:**

**//This code gives the roots of a quadratic equation using discriminant to find roots and its types.**

**#include "iostream"**

**using namespace std;**

**int main() {**

**float dsc, realPart, imaginaryPart;**

**int a, b, c;**

**cout << "For equation: ax² + bx + c = 0.\nEnter coefficients a, b and c: ";**

**cin >> a >> b >> c;**

**dsc = b\*b - 4\*a\*c;**

**//finding the roots according to type of discriminant:**

**if (dsc > 0) {**

**float root1 = (float(-b + sqrt(dsc))) / (float(2\*a));**

**float root2 = (float(-b - sqrt(dsc))) / (float(2\*a));**

**cout << "Roots are real and different." << endl;**

**cout << "x1 = " << root1 << endl;**

**cout << "x2 = " << root2 << endl;**

**}//when both roots are real**

**else if (dsc == 0) {**

**cout << "Roots are real and same." << endl;**

**float root = float(-b)/float((2\*a));**

**cout << "x1 = x2 =" << root << endl;**

**}//when only one root exists**

**else {**

**/\***

**formula used bellow is:**

**root= (-b ± sqrt(dsc))/(2a);**

**now for imaginary:**

**root = real + imaginary.**

**where real=-b/2a and imaginary=(sqrt(dsc)/(2a)).**

**resulting roots as x+yi where x and y are real and imaginary respectively.**

**\*/**

**realPart = float(-b)/float((2\*a));**

**imaginaryPart =(float(sqrt(-dsc)))/(float(2\*a));**

**cout << "Roots are complex and different." << endl;**

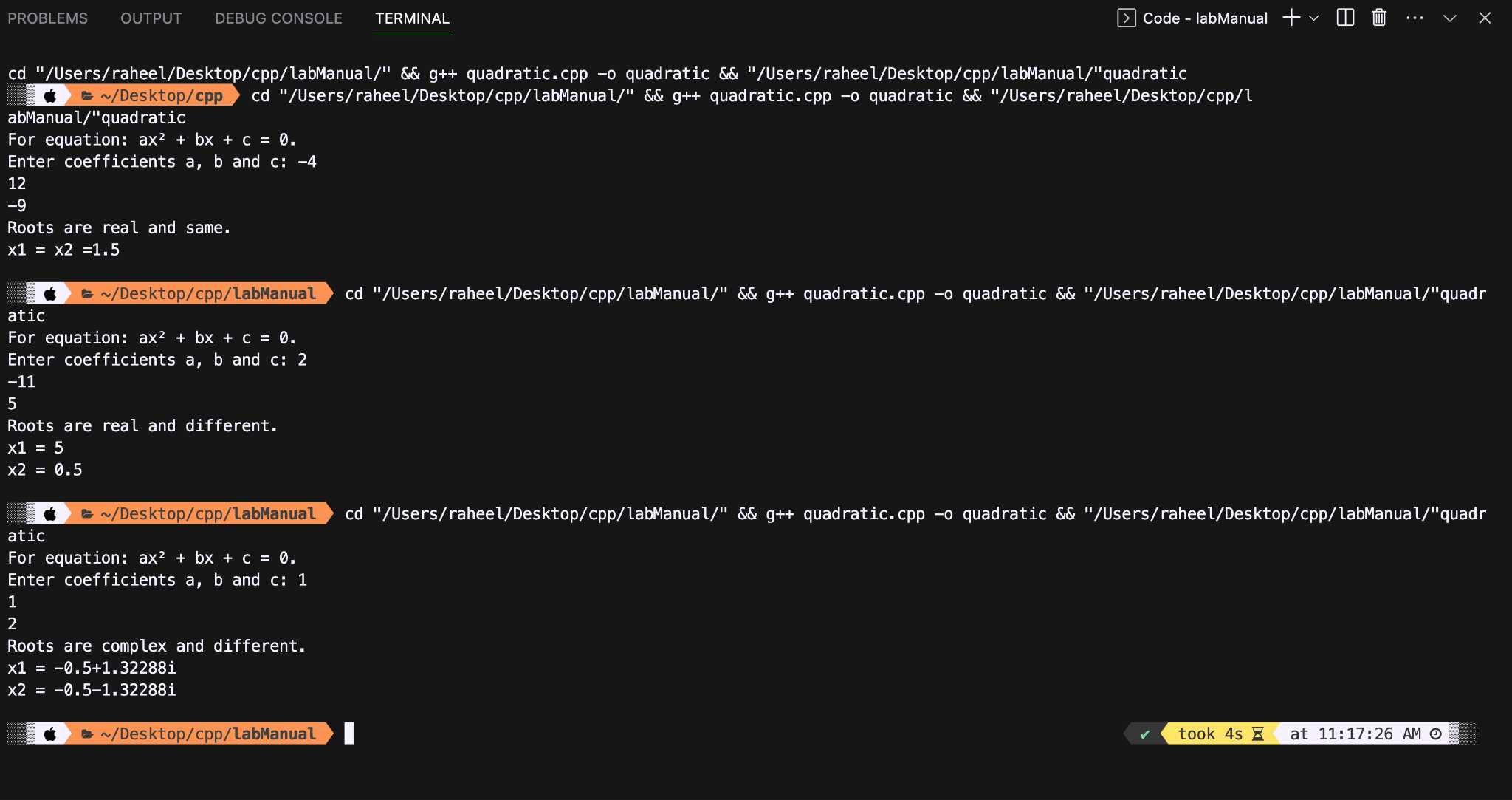
**cout << "x1 = " << realPart << "+" << imaginaryPart << "i" << endl;**

**cout << "x2 = " << realPart << "-" << imaginaryPart << "i" << endl;**

**}//when roots are imaginary**

**return 0;**

**}**

**Output:(screenshot):**