BIL141 Homework Assignment 1

Due date: 6.10.2019 23:59

In this homework assignment, you are to **find the roots** of quadratic equation and **calculate the value of same equation** for any value of x.

Quadratic equations has the following structure:

$$y = ax^2 + bx + c$$

where a, b, c are constants and x is a variable. In order to find the roots of the equation, you need to find the value of x when $y = 0$. It means that you need to solve the following equation:

$$ax^2 + bx + c = 0$$

After some derivation, the roots of a quadratic function are given by,

$$x = \begin{cases} \frac{-b \pm \sqrt{\Delta}}{2a}, & \text{if } \Delta \geq 0 \\ \text{no root}, & \text{otherwise} \end{cases}$$

where Δ term is the **discriminant** and calculated as follows,

$$\Delta = b^2 - 4ac$$

IO structure

You will be given one file named as `input.txt`. There will be 3 lines in this file.

- Equation itself.
- A decimal value for x.
- Another decimal value for x.

Your code should create an output file named as `output.txt`and it consists of several lines:

1. Rewritten equation
2. Discriminant value and information about how many roots we have.
3. [Roots] --depends on root count
4. Two extra lines for the result of the equation for given x values.

See 'Examples' section for more info.

Examples

Input File	Output File
y=1x^2+2x+1 3 5	Equation: y=1.00x^2+2.00x+1.00 Discriminant: 0.00. Therefore, there is one real root. Root: -1.00 For x=3.00, y equals to 16.00. For x=5.00, y equals to 36.00.
y=1.0x^2+2.0x+1.0 3 5	Equation: y=1.00x^2+2.00x+1.00 Discriminant: 0.00. Therefore, there is one real root. Root: -1.00 For x=3.00, y equals to 16.00. For x=5.00, y equals to 36.00.
y=5.0x^2-2.0x+10.0 3 5	Equation: y=5.00x^2-2.00x+10.00 Discriminant: -196.00. Therefore, there are no real roots. For x=3.00, y equals to 49.00. For x=5.00, y equals to 125.00.
y=9.0x^2-4.0x-10.0 7 2	Equation: y=9.00x^2-4.00x-10.00 Discriminant: 376.00. Therefore, there are two real roots. 1st root: 1.30 2nd root: -0.86 For x=7.00, y equals to 403.00. For x=2.00, y equals to 18.00.

Submission information

Send your source file to bil141fall2019@gmail.com and follow the name convention below, otherwise penalty will be applied to your final score:

```
email title         : [student_number]_[surname]_hw1
src code filename   : [student_number]_[surname]_hw1.c
```

For example:

```
email title         : 181117032_gudelek_hw1
src code filename   : 181117032_gudelek_hw1.c
```

Late submissions will be evaluted the information given in syllabus.