Assignment 3_1:
Due 8:00 AM Friday 10 Oct 2008
Submit: file zip of your source code to me and your tutor.

Objectives: In this assignment, you familiarize yourself with the if statement.

Note: You can discuss the assignment with your friends or your tutor but you have to complete by yourself. Copying other’s work is not permitted and you will get 0 point for any part you copied from your friends.

1. (20 points). Equation. Write a program to solve this equation: \( ax^2 + bx + c = 0 \).
   Notice that a, b, c are input data entered by the users. The result should be rounded with three decimal places.

Example:

<table>
<thead>
<tr>
<th>Test data</th>
<th>Expected result</th>
</tr>
</thead>
<tbody>
<tr>
<td>( a = 1, b = 2, c = 3 )</td>
<td>This equation has no root (( \delta &lt; 0 ))</td>
</tr>
<tr>
<td>( a = 1, b = -3, c = 2 )</td>
<td>This equation has 2 roots (( \delta &gt; 0 )): X_1 = 1; X_2 = 2</td>
</tr>
<tr>
<td>( a = 1, b = -2, c = 1 )</td>
<td>This equation has 1 root (( \delta = 0 )): X = 1</td>
</tr>
</tbody>
</table>

Below is the GUI of this program:
2. (30 points). **Triangle.** Write a program to ask the user enter the length of three sides of a triangle. Then your program will show the type of this triangle (equilateral, isosceles, scalene)

Example:

Please enter length of first side of a triangle: 5
Please enter length of second side of a triangle: 5
Please enter length of third side of a triangle: 6
This is an isosceles triangle.

3. (25 points). **Foreign exchange.** Using *if statement* to write a program which can convert foreign currency to VND (Vietnam Đồng) using the foreign exchange rate in the table below with some assumptions as follows;
• There’re only 4 currency codes as in table. If user inputs incorrect currency code, show an error message “There is no data for this foreign currency.”
• The user will enter input data according to this format:  
  CurrencyCode-ExchangeRate

<table>
<thead>
<tr>
<th>Currency Code</th>
<th>Exchange Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD</td>
<td>16610</td>
</tr>
<tr>
<td>JPY</td>
<td>156.93</td>
</tr>
<tr>
<td>CAD</td>
<td>15752</td>
</tr>
<tr>
<td>EUR</td>
<td>23556</td>
</tr>
</tbody>
</table>

Notice that Currency code can be entered in lowercase, uppercase, or mixed. The result should be rounded with three decimal places:

Some examples of input data:
  UsD-1000
  EUR-1500.567
  jpy-1500.567

Below is the GUI of this program:

4. **(25 points). Leap Year**. A year \( n \) is called a Leap year if it meets the following criteria:
   • If \( n \) is divisible by 100, then it must be divisible by 400.
   • If \( n \) is not divisible by 100, then it must be divisible by 4.
You base on above criteria and look at the flow chart below, write a program to determine whether a given year $N$ is a leap year or not. $N$ is the input data entered by the user.

- Is $N$ divisible by 4? If yes, proceed. If no, $N$ is not a leap year.
- Is $N$ divisible by 100? If yes, proceed. If no, $N$ is not a leap year.
- Is $N$ divisible by 400? If yes, $N$ is a leap year. If no, $N$ is not a leap year.

N is a leap year.