CS111 Homework 2

Name your program **hw2.cpp**. Program must be able to compile or you will get at most 1.5 out 3 points for the assignment.

The following exercise is taken from [https://www.engage-csedu.org/find-resources/program-2-formatted-output-decisions](https://www.engage-csedu.org/find-resources/program-2-formatted-output-decisions) with slight modification.

**Due: Friday September 29, 2017 by 11:59 PM**

For this assignment, write a program that will act as a wage calculator for a single user.

The program should prompt the user to enter the number of hours that they worked and their hourly wage. Those values will then be used to calculate:

- Gross Pay
- Amount of Deductions
- Net Pay

The **Gross Pay** is based upon the number of hours that were worked. If the user worked 40 hours or less, then:

\[ \text{Gross Pay} = \text{hours worked} \times \text{hourly wage} \]

If the user worked more than 40 hours, then:

\[ \text{Gross Pay} = 40 \times \text{hourly wage} + (\text{hours worked} - 40) \times \text{hourly wage} \times 1.5 \]

The **Amount of Deductions** is based upon the gross pay. If the user earned $100.00 or less, the deductions are 2% of the gross pay. If the user earned between $100.01 and $500.00, inclusive, the deductions are 5% of the gross pay. If the user earned more than $500.00, the deductions are 9% of the gross pay.

The **Net Pay** is based upon the gross pay and the deductions.

\[ \text{Net Pay} = \text{Gross Pay} - \text{Amount of Deductions} \]

After all of the values have been calculated, display a simple table that contains: the number of hours worked, hourly wage, gross pay, amount of deductions, and net pay.

The number of hours worked should be an **integer** value. The dollar amounts should all be **double** values. Use meaningful variable names.
Validate the inputs as follow:

i. If a user enters a negative number for worked hour, print out the following messages and **terminate** the program.

   You have entered a negative number for worked hour.
   Terminating the program.

ii. If a user enters a negative number for hourly wage, use a **while** loop and print out the following message until a correct value is entered.

   Your hourly wage is less than 0. Please try again:

Make sure to test your program with values that you have calculated.

**Output**

A few runs of the program should produce the following results.

**Run 1**

How many hours did you work? 30
How much do you make per hour? 11.25

Wage Calculator

<table>
<thead>
<tr>
<th>Hours Worked</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hourly Wage</td>
<td>11.25</td>
</tr>
<tr>
<td>---------------</td>
<td>-------</td>
</tr>
<tr>
<td>Gross Pay</td>
<td>337.50</td>
</tr>
<tr>
<td>Deductions</td>
<td>16.88</td>
</tr>
<tr>
<td>---------------</td>
<td>-------</td>
</tr>
<tr>
<td>Net Pay</td>
<td>320.62</td>
</tr>
</tbody>
</table>

**Run 2**

How many hours did you work? 32
How much do you make per hour? 2.50

Wage Calculator

<table>
<thead>
<tr>
<th>Hours Worked</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hourly Wage</td>
<td>2.50</td>
</tr>
<tr>
<td>---------------</td>
<td>-------</td>
</tr>
<tr>
<td>Gross Pay</td>
<td>80.00</td>
</tr>
<tr>
<td>Deductions</td>
<td>1.60</td>
</tr>
<tr>
<td>---------------</td>
<td>-------</td>
</tr>
<tr>
<td>Net Pay</td>
<td>78.40</td>
</tr>
</tbody>
</table>
Run 3

How many hours did you work? 40
How much do you make per hour? 12.59

Wage Calculator

Hours Worked 40
Hourly Wage 12.59

Gross Pay 503.60
Deductions 45.32

Net Pay 458.28

Run 4

How many hours did you work? 47
How much do you make per hour? 11.25

Wage Calculator

Hours Worked 47
Hourly Wage 11.25

Gross Pay 568.12
Deductions 51.13

Net Pay 516.99

Run 5

How many hours did you work? -1
You have entered a negative number for worked hour.
Terminating the program.

Run 6

How many hours did you work? 15
How much do you make per hour? -1
Your hourly wage is less than 0. Please try again: 9.5

Wage Calculator

Hours Worked 15
Hourly Wage 9.50

Gross Pay 142.50
Deductions 7.12

Net Pay 135.38