Deadline
Due by the end of lab. (Submit whatever you have by the end of lab, even if incomplete.)

How to submit
Submit your resulting .cpp and .h files for this lab using ~st10/111submit on nrs-labs, with a homework number of 89.

Purpose
To practice designing and writing C++ functions involving if and switch statements.

Important notes
• You are required to work in pairs on this lab exercise. If you are not pair-programming, then you may not receive full credit for your lab exercise.
• Put both of your names either at the beginning or the end of your purpose statements for lab exercise functions.
• If you have a question during lab, and I am helping another pair, add one or both of your names to the "Next:" list on the board, and I will get to you as soon as I can.

Problem 1
Make a directory for this lab exercise on nrs-labs:
mkdir lab9
chmod 700 lab9
cd lab9
Recall that C++ string class instances have a length method (which we used in Week 8 Lab's name_length function).
Using funct_play and the design recipe, design and write a C++ function ck_length that expects a string and a maximum string length, and if the string's length is less than or equal to that given length, it returns the given string unchanged -- otherwise, it returns the string "TOO LONG".

Problem 2
Using funct_play and the design recipe, design and write a C++ function next_color that expects a current traffic light color expressed as a string -- "red", "yellow", or "green" -- and produces the color that a traffic light should switch to next, based on:
• currently "red"? next color should be "green"
• currently "yellow"? next color should be "red"
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• currently "green"? next color should be "yellow"
• what if some joker calls this with a string or color that isn't one of the above? return the string "error"

Problem 3

CHOOSE one of the following two options.
(OR -- do BOTH, and
• IF ((you submit working functions each appropriately using a switch statement with all design recipe parts for options 1 and 2)
  AND (you submit correct signature, purpose statement, header, at least the minimum number of examples, and body for BOTH options in Problem 3))
  {
    I'll add 20 points to your semester homework grade total (the effect of this is like adding 20 points to one of your homework grades)
  }
)

3 option 1

Consider the following chart, showing Roman numeral symbols and their corresponding values:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>1</td>
</tr>
<tr>
<td>V</td>
<td>5</td>
</tr>
<tr>
<td>X</td>
<td>10</td>
</tr>
<tr>
<td>L</td>
<td>50</td>
</tr>
<tr>
<td>C</td>
<td>100</td>
</tr>
<tr>
<td>D</td>
<td>500</td>
</tr>
<tr>
<td>M</td>
<td>1000</td>
</tr>
</tbody>
</table>

Using funct_play and the design recipe, develop a function roman_val that expects a single character, and if it is one of those above in the chart, it returns its value; otherwise, it returns 0. For full credit, appropriately use a switch statement in this function.

3 option 2

Consider: there are times (such as when you are converting words into pig latin) when you'd like to know if a letter is a vowel or not.

Using funct_play and the design recipe, develop a function is_vowel that expects a single character, and if it is a vowel, it returns true; otherwise, it returns false. For full credit, appropriately use a switch statement in this function.

(For our purposes here, a vowel is a, e, i, o, u, A, E, I, O, U.)