Assignment 4
Strings and Functions
Due: Monday, February 15, 2016 11:59pm

Grading: EVERY assignment in this course is graded by demoing your work for 10 minutes with a TA. You are required to meet with a TA within one week after the due date to demo. You are penalized for failure to see a TA within the week or missing a scheduled appointment. In either case, if you are within 1 day (24 hours) of the deadline, you lose 10 points. If you are within 7 days (1 week) of the deadline, then you lose 25 points, anything outside of a week from the deadline to demo is an automatic 50 point deduction. Your job is to convince the TA that your program works correctly, i.e. show your TA how to use/break your program☺

(70 pts) Wheel of Fortune
You will implement the program for playing a modified Wheel of Fortune. The game must allow a user to enter the number of rounds to play and a new secret message (possibly containing blanks) with each round, and print the number of dashes/slots for the message (spaces do not get dashes, just the space).

The game can play with 1-3 players, and it continues a round, until someone solves the puzzle correctly. A new puzzle is given with each round. In this Wheel of Fortune, you won’t win as much or any prizes, but you might go bankrupt or lose a turn!!! Your random numbers are only from 0-21, with 0 being bankrupt, 1-20 being the dollar amount earned per letter found in the puzzle, and 21 is lose a turn.

The game begins by asking the first player if he/she wants to spin the wheel, buy a vowel, or solve the puzzle. On a player’s first turn, it might not make sense to choose anything other than spinning the wheel, but a player is given these three choices at all times during their turn, until they guess an incorrect non-vowel letter, incorrectly solve the puzzle, or spin a 0 or 21.

If the player chooses to spin and the spin is >0 and <21, then the player is asked to guess a non-vowel letter. If the non-vowel letter was not found in the puzzle, then the player loses their turn to the next player. If the non-vowel letter is found in the puzzle, then the player wins the number of letters found * the dollar amount spun.

If a player spins a 0, then the player’s earnings go to a zero in that round, and the next player gets the three choices to spin the wheel, solve the puzzle, or buy a vowel. If a player spins a 21, then the player’s keeps the round earnings, but the next player gets the three choices to spin the wheel, solve the puzzle, or buy a vowel.

If a player chooses to solve the puzzle and does so correctly, then the player gets to keep all the money earned in that round, while all other players lose their money in that round. If a player chooses to solve the puzzle and does so incorrectly, then the turn goes to the next player.

A player can only buy a vowel when his/her earnings are >= $10, which is the one-time amount paid for each vowel guess, regardless of whether the vowel is found.

The player who has the most money after N rounds is the winner!
A few rule specifics:

- You have a total round earnings and a total game earnings.
- You always get a choice of spinning the wheel, solving the puzzle, or buying a vowel during your turn.
- You lose your turn by incorrectly guessing a non-vowel letter on a spin, spinning a 0 or 21, or incorrectly solving the puzzle.
- If you spin > 0 or <21, then you get the number spun * the number of non-vowel letters found added to your round total.
- If you spin a 0, then you go bankrupt in the round (lose your round total), and it ends your turn.
- If you spin a 21, then you keep your round total, but it ends your turn.
- You can buy a vowel for $10, and you only pay the $10 vowel purchase once on a guess, independent of how many are found.
- If you solve the puzzle correctly, then you keep the money earned for that round and add it to your total game earnings.
- You win the game by having the most game earnings, not round earnings!!!

Your program must print out 1) the number spun on the wheel, 2) the number of letters found for a guess, 3) the total round earnings, 4) the message with the correctly guessed slots and blank slots, 5) if the user guesses the message, then a winner message and the total game earnings for all players, and 6) after all rounds are played, a message with the winning player.

Program Requirements:

- Only use C++ strings, no need for an array! Hint: use two strings!
- Your program must ignore cases in the message.
- Each function, including main, may not have more than 15 lines of code (this doesn’t include comments and blank spaces!).
- You are not allowed to use global variables.

Read the C++ string documentation to help with this assignment: http://www.cplusplus.com/reference/string/string/?kw=string

**You can decide how many incorrect guesses a user gets before they lose. In addition, you can use the system(“clear”); command from the <cstdlib> to clear the screen, after the user enters their message. Yes they can scroll above to see the message, but we aren’t cheaters!!!

Example Run:
Enter a message: National Park Service
How many players do you have? 2
How many rounds for winning? 1

The message is _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Player 1:
Do you want to spin (1), solve the puzzle (2), or buy a vowel (3): 1

Your wheel landed on 20
Guess a letter: n
2 found. Total: $40
The message is N _ _ _ _ n _ _ _ _ _ _ _ _ _ _ _ _

Do you want to spin (1), solve the puzzle (2), or buy a vowel (3): 1
Your wheel landed on 10
Guess a letter: l
1 found. Total: $50
The message is N___n_l___

Do you want to spin (1), solve the puzzle (2), or buy a vowel (3): 3
Guess a vowel: a
3 found. Total: $40
The message is Na____n a l__a__

Do you want to spin (1), solve the puzzle (2), or buy a vowel (3): 1

Your wheel landed on 0
Total: $0
The message is Na____n a l__a__

Player 2:
Do you want to spin (1), solve the puzzle (2), or buy a vowel (3): 1

Your wheel landed on 5
Guess a letter: r
2 found. Total: $10
The message is Na____n a l__a r__r___

Do you want to spin (1), solve the puzzle (2), or buy a vowel (3): 1

Your wheel landed on 10
Guess a letter: t
1 found. Total: $20
The message is Na_t__n a l__a r__r___

Do you want to spin (1), solve the puzzle (2), or buy a vowel (3): 2

Guess message: National Park Service
You are correct! Player 2 wins round 1.
Player 1 total: $0
Player 2 total: $20

Player 2 wins game!

(10 pts) Extra Credit Error Handling
Make it so that your program never errors on users input! Handle the following errors:
- The user enters a message or letter outside of A-Z and a-z.
- The user enters an invalid menu choice.
- The user enters a vowel for a non-vowel guess.
- The user enters a non-vowel for a vowel guess.

(-10 pts) Warning: You are not allowed to use global variables in any assignment in CS 161. There isn’t any practical purpose for them in this course. Keep this in mind as you design your program with functions.
(10 pts) Design
You will design a solution for the problem statement as well as answer the following questions for each function that you write.

- What is being passed into this function?
- What is being returned?
- What must be true before this function can be called?
- What will always be true after this function is called?

Your design can be in the form of a flow chart, pseudocode, or both. **DESIGN BEFORE YOU CODE.** While there is no way that we can check that you actually did, it will make writing the code take much less time.

(10pts) Testing
Fill out this testing table for your program (the first row is an example and you must test more than one).

<table>
<thead>
<tr>
<th>Inputted Values</th>
<th>Expected Output</th>
<th>Actual met Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hello</td>
<td>_ _ _ _ _</td>
<td>yes</td>
</tr>
</tbody>
</table>

(10 pts) Program Style/Comments – For both programs!!!
In your implementation, make sure that you include a program header in your program, in addition to proper indentation/spacing and other comments! Below is an example header to include. Make sure you review the style guidelines for this class, and begin trying to follow them, i.e. don’t align everything on the left or put everything on one line!

http://classes.engr.oregonstate.edu/eecs/winter2016/cs161-001/161_style_guideline.pdf

/*****************************************************/
/** Program: wheel_fortune.cpp
 ** Author: Your Name
 ** Date: 2/05/2016
 ** Description:
 ** Input:
 ** Output:
*****************************************************/

Electronically submit your C++ program (.cpp file, not your executable!!!) and pdf, by the assignment due date, using TEACH.

https://secure.engr.oregonstate.edu:8000/teach.php?type=want_auth

**NOTE:** The easiest way to upload your program from ENGR to TEACH is to map a network drive to your home directory on ENGR. Mac or Windows, See: http://engineering.oregonstate.edu/computing/fileaccess/

If you are doing this off campus, pay attention to the off-campus directions!!!!