LEBANESE AMERICAN UNIVERSITY

Electrical and Computer Engineering Dept

COE 593 (COE Application)

Fall 2013

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Projects II

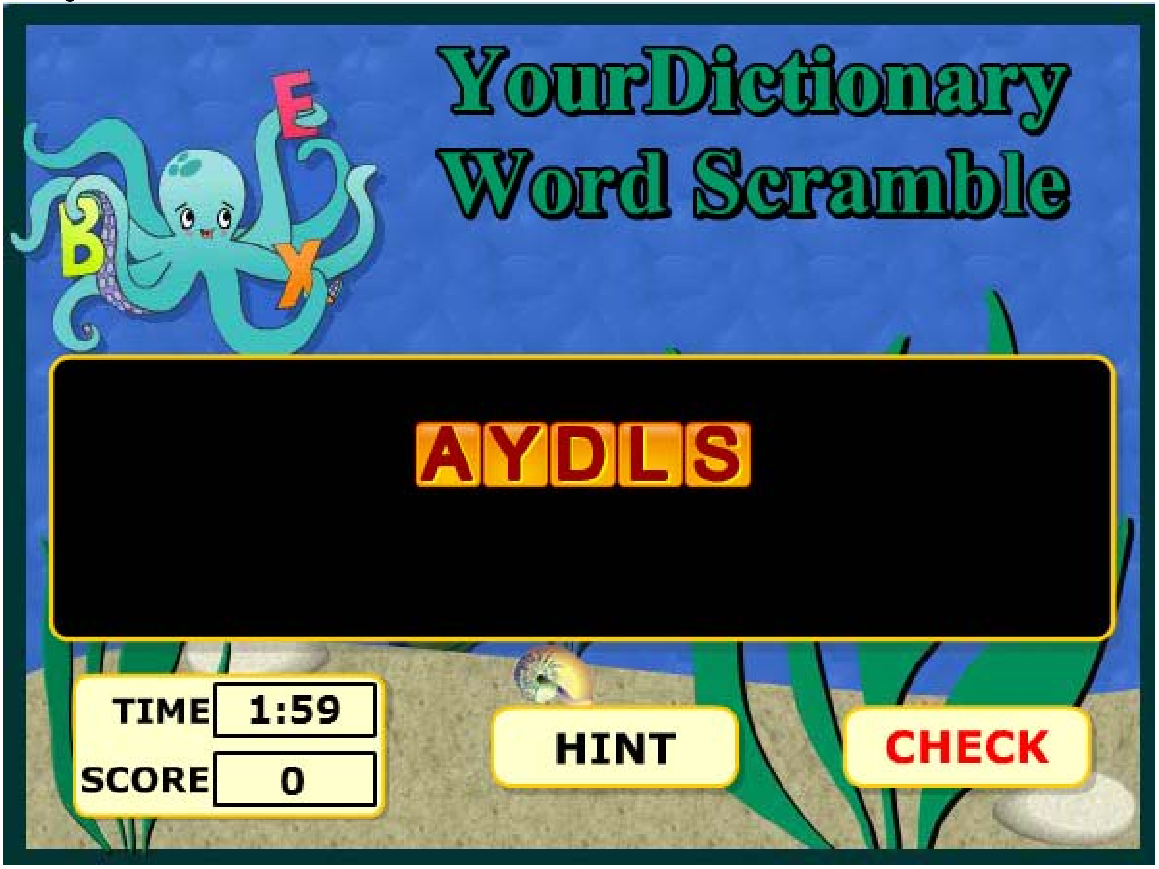
Project II (Due date: Monday December 23, 2013)

I. Objective

In this project, you are tasked with building **a word scramble game**. You can get right to the good stuff and get a sense of where the game is headed by visiting: http://www.yourdictionary.com/word-games/Word-Scramble/Word-Scramble-Game.html. Don't spend a lot of time playing that game as we have got a lot of work to do ☺

II. Understanding the Game

The game will make use of an **online-dictionary web service** to get the words that will be presented to the user. The application scrambles the letters of a word and asks the user to enter the correct word. The user is then required to unscramble the word. The user interface of the application may be designed so that it looks like the one given below:



To make the application interesting, your game must support the additional features discussed in what follows.

III. Timer function

The **first bit of functionality** to be supported by your application takes the form of a **timer function** that gives the user a limited amount of time to unscramble a word. In the above presented figure, a timer is displayed in the bottom left corner indicating how much time the user is left with to unscramble the current word.

IV. Scoring System

Once you have introduced the timer functionality to your application, augment your implementation with the following additional feature. Make sure that your application is capable of **keeping track of the user's score**. The score assigned to the user depends on the number of letters that are not in their correct positions ($\mathbf{N_{INC}}$) as well as the amount of time it takes the user to figure out the correct word ($\mathbf{T_{ELAPSED}}$). In particular, the score can be derived using the following formula: $\mathbf{N_{INC} * (T_{TOTAL} - T_{ELAPSED})}$, where $\mathbf{T_{TOTAL}}$ represents the total amount of time initially allocated for the user and within which the user has to identify the correct word.

V. Hints

The third feature involves equipping your application with the ability to supply hints for the end user. In the figure presented earlier, this functionality is provided through the **button** labeled **"Hint"**. The main idea lies in providing a definition for the scrambled word with a view to making the process of correctly identifying that word easier. It is important to highlight the following in this regard. Each time the user clicks the "Hint" button, he/she should get a different definition. So, make sure to compile a list of different definitions per word and to enable the user to cycle through these definitions by means of the "Hint" button.

VI. Levels and Bonus

Finally, finalize the implementation of your application by including up to **five** different levels. The degree of difficulty associated with each level should be function of both the **number of letters that make up the unscrambled words that the user is presented with in a level** and the **amount of time** within which the word is to be unscrambled. Specifically, the specifications pertaining to each level are summarized in the following table:

Level	**Length of words**	**Time per word**	**Number of failed attempts**	**Number of successive correct words**
1	3-letter words	80 seconds	3	3
2	4-letter words	70 seconds	4	4
3	5-letter words	60 seconds	5	5
4	6-letter words	50 seconds	6	6
5	7-letter words	40 seconds	7	7

Note that the last column in the above table represents the number of successive words that the user should get right before advancing to the next level while the column preceding the last one lists the maximum allowable number of failed attempts in each level. So, for instance, in level 1, the user should identify correctly 3 words in a row before being granted access to level 2 and if he/she ever fails to identify three consecutive words, he/she loses. The second and third columns on the other hand contain respectively the length of the words presented to the user per level and the amount of time the user is entitled to per word in each level.

To further improve the end user experience and make the application even more exciting, your last task would be to introduce bonuses/penalties to each one of the five levels as follows. In each level, you can reward your end user by adding 10 extra seconds to his/her timer whenever he/she correctly identifies two successive words and punish the user by removing 10 seconds from his/her timer each time he/she gets two successive words wrong.

What to turn in?

This project is due at the beginning of class on the due date. You have to turn in the following material in both **hard** and **soft** copies.

Criteria	**Percentage**
Documentation of your solution including explanations and illustrations in one or two pages along with short write-up of questions and/or problems that you encountered while doing this assignment.	2 pts (10%)
Source code that contains an appropriate amount of comments. Well-organized and correct code receives 16 pts, messy yet working code receives 10 pts, code with bugs receives 2 pts, and incomplete code receives 1 pt.	16 pts (80 %)
Execution output such as a snapshot of the contents of standard output. A correct output receives 2 pts, the one with minor errors receives 1 pt, and an incomplete output receives 0 pts.	2 pts (10%)
Total	20 pts (100%)

Good Luck!