

SIT323 Practical Software Development, Trimester 2, 2015

Assignment 1 - Crozzle Validation

Due Date

Start of Week 7, Monday 9:00 am, August 31

Introduction

Assignment 1 and 2 comprise parts of the one project that must be developed using C# and MS Visual Studio. These require you to design and develop software related to the word game called crozzle (see class notes of week 1). In brief:

1. the first assignment focuses on:
 - loading data from files related to any completed crozzle,
 - validating/invalidating input data files and crozzle,
 - computing the score of a crozzle,
 - displaying that crozzle and its score,
 - coding to conventions and standards, and
 - implementing menus, file dialogs and regular expressions;
2. the second assignment focuses on:
 - loading data from files related to creating a new crozzle such that its score is valid and is the highest possible that you can achieve,
 - ensuring that this new crozzle is valid,
 - saving a crozzle to a file,
 - optimisation techniques,
 - appropriate scoping of code elements,
 - method characteristics such as cohesion, coupling, pre and post conditions,
 - the usage of return statements,
 - implementing exception handling.

Software Requirements

Your software solution for assignment 1:

1. requires a GUI interface.
2. requires the following data from the user via a CSV file (see "Names EASY wordlist.csv" as an example):
 - a file header that is immediately followed by a list of words. The number of words in this list ranges from 10 to 1000. This list does not contain duplicates.

This header consists of:

- a number representing the actual number of words in the list of words.
- crozzle dimensions. One might consider a crozzle as a 2D array of characters. The provided width value ranges from 4 to 400, inclusive. The provided height values will range from 4 to 400, inclusive.
- difficulty level: either EASY, MEDIUM, HARD or EXTREME as the only valid difficulty values.

3. requires the following data from the user via a TXT file (see "Names EASY crozzle.txt" as an example):
 - a crozzle which is placed within the first several lines and first several columns of the TXT file. If you open the data file "Names EASY crozzle.txt" using Notepad, you would see a crozzle displayed in the first several rows and columns.
4. requires both input data files to be validated. Aspects of these files which are found to be invalid must be reported to a log file.
5. requires the crozzle to be validated, only if the input data files are valid. Aspects of this crozzle that are invalid must be reported to a log file.
6. requires the valid or invalid crozzle to be displayed.
7. requires the score of a valid crozzle to be computed and displayed, but display 0 for an invalid crozzle.
8. requires constraints to be considered when validating a crozzle and determining a crozzle score (see below). There are constraints for 4 difficulty levels (EASY, MEDIUM, HARD and EXTREME); some constraints are common to all levels.

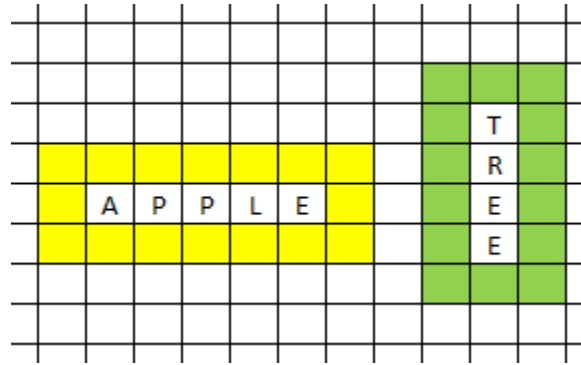
Constraints

Constraints common to all crozzles

1. Each sequence of two or more horizontal (vertical) characters delimited by spaces or the crozzle edge must form a word that can be found in the wordlist.
2. A word cannot be inserted in the crozzle more than once.
3. A word can be inserted horizontally but only run left to right.
4. A word can be inserted vertically but only run high to low.

Constraints for the EASY difficulty level (in addition to common constraints)

1. A horizontal word must intersect 1 or 2 vertical words.
2. A vertical word must intersect 1 or 2 horizontal words.
3. One point is scored for each letter within a valid crozzle.
4. A horizontal word cannot touch any other horizontal word. That is, there must be at least one grid space between a horizontal word and any other horizontal word. For example, no letter from any other horizontal word can be placed into the yellow region in the following diagram.
5. A vertical word cannot touch any other vertical word. That is, there must be at least one grid space between a vertical word and any other vertical word. For example, no letter from any other vertical word can be placed into the green region in the following diagram.



Constraints for the MEDIUM difficulty level (in addition to those common constraints)

1. A horizontal word must intersect 1 or 2 vertical words.
2. A vertical word must intersect 1 or 2 horizontal words.
3. Points are scored for each letter within a valid crozzle based on the following equivalences: A=1, B=2, C=3, D=4... X=24, Y=25, and Z=26.

Constraints for the HARD difficulty level (in addition to those common constraints)

1. A horizontal word must intersect 1 or more vertical words.
2. A vertical word must intersect 1 or more horizontal words.
3. 10 points are scored for each word placed from the word list into a valid crozzle.
4. Points are scored for each letter within a valid crozzle based on the following equivalences: A=1, B=2, C=3, D=4... X=24, Y=25, and Z=26.

Constraints for the EXTREME difficulty level (in addition to those common constraints)

1. A horizontal word must intersect 1 or more vertical words.
2. A vertical word must intersect 1 or more horizontal words.
3. You can only have one group of connected words, That is, a group of connected words cannot be disconnected from another group of connected words.
4. 10 points are scored for each word placed from the word list into a valid crozzle.
5. Each letter at the intersection of two words is awarded points as follows:
 - 1 point for A, E, I, O, U
 - 2 points for B, C, D, F, G
 - 4 points for H, J, K, L, M
 - 8 points for N, P, Q, R
 - 16 points for S, T, V,
 - 32 points for W, X, Y
 - 64 points for Z