

EE2331 Data Structures and Algorithms

Assignment 2 – Word Puzzle Solver

A word puzzle grid is a square grid of letters. Real games usually use a 4x4 or 5x5 grid, but 2x2 and up are possible. The goal of the game is to find as many words as possible in the grid. Words must be formed from letters in adjacent positions (up, down, left, right, or diagonals), and must be 3 letters or longer. Because diagonals are allowed, quite a few words can be formed, even in a 3x3 grid. Here is an example of a grid, and all the words it contains from the list dictionary.txt:

```
m m g
e u s
k d e
```

Words in grid: *des, due, dues, dug, dugs, duke, ems, emu, emus, gude, gudes, gum, gummed, gums, kue kues, mem, mems, mud, muds, mug, mugs, mum, mums, mus, muse, mused, sedum, smug, sue sued, suede, sum, summed, uke, use, used*

In this exercise, you are asked to write a **word puzzle solver** that uses backtracking technique to find all words from a dictionary that appear in a puzzle grid. You are given three files (**assignment_2.cpp**, **solver.h** and **dictionary.txt**). Read the codes and documentations carefully. Complete the class ***Solver*** (defined in solver.h) by implementing the two member functions as described.

```
// Return true if the word appears at least once in the grid.
// Otherwise return false
bool contain(string word) const;

// Find every word from the internal dictionary that appears in the grid and
// store them in the results list
void solve(list<string>& results) const;
```

You can modify the main function and add additional test cases. However, **DO NOT** modify the function signatures given to you. You may define additional **private** member functions as you need.

Submission Instructions

Marks will be deducted if you do not follow the guideline below:

1. You ONLY need to submit the file ***solver.h*** to Canvas. Write your name and student ID in the comment section at the top.

2. No marks will be given to an incomplete function or wrong output.
3. You must hand in your work to the Canvas before the due time. Other means are not accepted.
4. Late submission, through email, will be subject to mark deduction of 20% per day.

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