**CS173 Intermediate Computer Science**

**Project 4: Word Search**

**OVERVIEW**

The main purpose of this project is to write a c++ program to solve a word search puzzle. Word searches are grids of letters with hidden words in the grid. Words can run forwards, backwards, up, down, or diagonal in any of the four diagonal directions. Your program will read in a puzzle and a list of words to find, and then print the locations of those words.

**LOGISTICS**

This is a group project. You are to share equitably in the work with your assigned partners. In your comment block at the top, please indicate each partner and the portion of the work they solved in this problem. The instructor may assign different grades to partners if one partner does not contribute equitably to the project.

**INPUT**

Your program should read from stdin. Use I/O redirection to send the files to your program. On canvas, I have posted two sample data files. Each one contains a word search puzzle and then a list of search words. You should test your program on these sample files and also additional files that you create or modify from the given examples.

As you can see from the samples, all word search puzzles are on a 14 x 14 character grid. You can assume all puzzles will be this size. The puzzle is given first in the sample data files. Following the puzzle is a number indicating how many search words go with the puzzle. You are to read in, store, and then find these search words in the puzzle. All letters in the puzzle and the search words will be upper case letters. Ignore any spaces or punctuation (anything that isn't between A to Z inclusive).

**OUTPUT**

You should first print the puzzle back to the screen (to stdout). Then you should report each search word, one per line. For each search work, your program should report the location (x,y coordinates starting at 0,0) and the orientation (up, down, up/right, down/right, etc. ).

* If a search word is not found, then report "not found" for that search word.
* If a word appears in multiple places, report the earliest row, then the earliest column. If the word appears multiple times starting in the same row/col then report (up, up right, right, down right, down, down left, left, and up left) in that order.
* Only report the “earliest” occurrence for a word that appears multiple times.
* If a word is only 1 character, report “up”. Empty search words are not allowed.
* Follow the format below in the sample output.

**SAMPLE INPUT**

O S O U K R S H P L A R U E

T L E N N Y A P M A R G M U

T M S U T E L C E M O E H E

O I P S A H E N C R H W E R

N E U M O I E M B A R N E Y

S R I T L L G M R B U R N S

K E E L S P L S E L M A E I

N M I O Y A I S E P E L T R

U W N H O T S T P E B M N T

P P L R H T A R H H E A T L

A D M Y N Y H O M E R R R N

A N H O H R T S E G R A M T

N E D T S R E H T I M S B M

T P L M T S R R L G L M L O

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HOMER

MARGE

BART

LISA

KRUSTY

BARNEY

GRAMPA

MOE

APU

CLETUS

MRBURNS

OTTO

NELSON

NED

SELMA

PATTY

RALPH

WILLIE

SMITHERS

LENNY

MAGGIE

**SAMPLE OUTPUT**

O S O U K R S H P L A R U E

T L E N N Y A P M A R G M U

T M S U T E L C E M O E H E

O I P S A H E N C R H W E R

N E U M O I E M B A R N E Y

S R I T L L G M R B U R N S

K E E L S P L S E L M A E I

N M I O Y A I S E P E L T R

U W N H O T S T P E B M N T

P P L R H T A R H H E A T L

A D M Y N Y H O M E R R R N

A N H O H R T S E G R A M T

N E D T S R E H T I M S B M

T P L M T S R R L G L M L O

HOMER found at (10,6) going right

MARGE found at (11,12) going left

BART found at (8,10) going down right

LISA found at (6,6) going down

KRUSTY found at (6,0) going up right

BARNEY found at (4,8) going right

GRAMPA found at (1,11) going left

MOE found at (2,9) going right

APU found at (10,0) going up

CLETUS found at (2,7) going left

MRBURNS found at (5,7) going right

OTTO found at (0,0) going down

NELSON found at (3,7) going down left

NED found at (12,0) going right

SELMA found at (6,7) going right

PATTY found at (6,5) going down

RALPH found at (0,11) going left

WILLIE found at (8,1) going up right

SMITHERS found at (12,11) going left

LENNY found at (1,1) going right

MAGGIE not found