

CS 100 Project Five – Spring 2019

Project Overview: In this project, you will write a program to solve a simple word search puzzle. The puzzle will be saved in a file, and the filename will be provided as a command-line argument to the program. The program will first read in a puzzle, and then it will repeatedly ask for a word to be searched until the user enters CTRL-D. For each word, the program will search for its existence in all eight directions as shown below and report the search results.

- Northward, bottom-to-top
- Southward, top-to-bottom
- Eastward, left-to-right
- Westward, right-to-left
- Northeastward
- Southeastward
- Southwestward
- Northwestward

As an example, consider a 5x5 puzzle saved in a file named **data1**, as shown below.

p	t	a	t	i
d	o	a	a	c
o	r	i	c	e
g	o	a	n	a
e	t	a	c	t

The following shows the result of executing `./a.out data1`, when the user is searching for the word **cat**.

The word puzzle is:

ptati
doaac
orice
goana
etact

Enter a word to search in the puzzle (or CTRL-D to exit): **cat**

"cat" was found as below.

1 times in the northward direction
0 times in the southward direction
0 times in the eastward direction
1 times in the westward direction
0 times in the northeastward direction
0 times in the southeastward direction
1 times in the southwestward direction
1 times in the northwestward direction

-t-t-
--aa-
---c-
--a--
-tac-

Enter a word to search in the puzzle (or CTRL-D to exit):

You can assume the file specified by the user can always be opened for reading and follows the following format.

- The puzzle saved in a file will be of a **square** shape.
- Each line of the file corresponds to a row of the puzzle.
- There are no blank lines between two rows.
- Each line starts with a letter and ends with a newline.
- There are no space or tabs between two letters.
- The puzzle size can be determined by counting the number of letters before the first newline.

You can further assume a word entered by the user will have a length from 2 through 100. Please see an actual word search puzzle and its related words at the end of this document.

What You Need To Do

- Create a directory named **project5** on your machine. In that directory, create a file named **puzzle.c**
- In **puzzle.c**, write the code needed to solve the problem stated above. Make sure that your program has a header block of comments that includes your name and a brief overview of the program.
- When you are ready to submit your project, compress your **project5** directory into a single (compressed) zip file, **project5.zip**. See the **Basics** document on Blackboard if you don't remember how to do it.
- Once you have a compressed zip file named **project5.zip**, submit that file to Blackboard.

Project 5 is due at 5:00pm on Wednesday, April 3. Late projects are not accepted.

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**You may not post this document or a portion of this document to a site
such as chegg.com without prior written authorization.**

A project shall be completed individually, with no sharing of code or solutions.

**All submissions will go through MOSS (Measure Of Software Similarity)
for similarity check.**

The University of Alabama's Code of Academic Conduct will be rigorously enforced.

Sample execution of the program

```
./a animal.dat
```

The word puzzle is:

GEZDQQTIKIOPOSSUMCGRR
EDBVFENXRANLHNDGOATEX
RGHJLEUINGIITAYLXPDTAL
BHWDPYRIWAFEMWXNHSLSG
IJNDEKDRUWVCSRLVBLJOI
LKMKICMQEPWTTUALOIFDLW
HPNARCATQFTFYEVFLHFNBD
FODURTQGIHUURDCRDNDNFS
MKAZMIFKUWOTDNNDOEYIA
QEWYEDNDSISRIIJQKCVSL
SOQSDWIEMUNHSFSCWJSHA
CEOWEQYSFCEFEITMPNQ
WOODCHUCKPRWAHRATIAAA
GRYXLHUTJBQOCPHBFQKWN
HTFGSHEEPBANIRISAEAD
MFFBALPSPMBGTPGNOEZE
ORRZBVIAGVIOEFGBNDKR
UOBWCMWOPHLKOPLVVBZS
SGMCWHTDURTLENWYQVMD
ENMZRRLNZIARDENIGZQWT
ARMADILLOJMGXGABDCJFM

Enter a word to search in the puzzle (or CTRL-D to exit): **RABBIT**

```
"RABBIT" was found as below.
0 times in the northward direction
0 times in the southward direction
0 times in the eastward direction
0 times in the westward direction
0 times in the northeastward direction
1 times in the southeastward direction
0 times in the southwestward direction
0 times in the northwestward direction
```

-R-
-A-
-B-
-B-
-I-
-T-

Enter a word to search in the puzzle (or CTRL-D to exit):

Please search the words below.

ARMADILLO BABOON CAT CHICKEN CHINCHILLA
COW DOG FERRET FROG GERBIL GOAT GOLDFISH
GOOSE HAMSTER HORSE LIZARD LOBSTER MONKEY
MOUSE OPOSSUM PIG PIGEON QUAIL RABBIT RAT
SALAMANDER SHEEP SNAKE TURTLE WOODCHUCK