

## CSCD 340

### Lab 4

Your answers will be in the form of a PDF/C Code.

1. One of the operations the shell performs is to parse a string into tokens. When you run your program with `./a.out` `argc` will have the value of 1, and `argv[0]` will have the value of `./a.out`. Understanding how to tokenize a string is an important concept. For this question you will emulate the parsing the shell does. You will need to complete several functions.

Write a function that will parse a string into tokens (or words), similar to what the shell is required to do. The function is named `makeargs`.

The prototype is given as: `int makeargs(char *s, char*** argv);`

This function should accept a (c-type) string and a pointer to a two dimensional array representing the tokenized string. The function will return a 2D array of characters. Tokens are delimited via whitespace `'\t'`, `'\n'`, `' '`. The function will return an `int` representing the number of tokens in the string. Each row in the 2D array will be a separate token. The 2D array will contain one extra row that contains a null pointer. If a problem occurred during operation of the function, then return -1.

For example, given the following C code

```
int main()
{
    char **argv, s[] = "ls -l file";

    int argc;

    argc = makeargs(s, &argv);

    printargs(argc, argv);
} // end main
```

The results of `makeargs` would be:

`argc` would be 3.

`argv[0]` would be 'ls'

`argv[1]` would be '-l'

`argv[2]` would be file

`argv[3]` would be `'\0'`

You must not waste memory, and any memory you allocate you must clean up.

I have provided as a starting point `cscd340Lab4.c`

NOTE: The strings will be entered on the command line separated by a single space. You can presume the happy part of Stuland. HINT: You may need `strtok_r` and other string commands.

DO NOT use **realloc**, use only **free** and **malloc/calloc**

## FOR EXAMPLE

The user might enter: how now brown cow

And your program would report 4 strings and then print each string.

This will continue until the user types exit.

## NOTES

- I have provided stubbed out code that you must use – You WILL NOT change my main or the file cscd340Lab4.c
- You must use strtok\_r from string.h.
- For ease I have provided myUtils.h and myUtils.c – You may not change these files in any fashion and you must use them.
- You must use my Makefile – there should be no reason to modify it.
- Your output capture should have multiple outputs showing you truly tested your program.  
NOTE: the grader will be running **valgrind** on your program so make sure you clean up memory. These runs are stored in your PDF named lab4output.pdf

## TO TURN IN

A zip of Lab4 folder containing

- Your PDF file
- All code necessary to compile and execute your program
- My Makefile

You will submit a zip file named your last name first letter of your first name lab4.zip  
(Example steinerslab4.zip)