CS-392-A, Spring 2017
In-class Lab - mygrep
Assigned: Tue,. Mar. 7 2017 Due: Thu., Mar. 9, 11:59PM

1 Introduction

The purpose of this lab is to become more familiar with C programming, pointers, C strings, and standard I/O. For this, you will develop a simple version of the Unix utility `grep`.

2 Logistics

You can work in groups in the classroom, but the code you develop **must** be written and it will be submitted as an individual assignment. All handins are electronic and will be done through gradescope.

3 Handout Instructions

Download mygrep-handout.tar from Canvas.

Start by copying `mygrep-handout.tar` to a directory on a Linux machine in which you plan to do your work, preferably the VM distributed through canvas. Then give the command

```
unix> tar xvf mygrep-handout.tar
```

This will cause a number of files to be unpacked in the directory. The only file you will be modifying and turning in is `mygrep.c`.

4 mygrep

Your program will be a simple version of the `grep(1)` utility. It will search an input file selecting the lines that match a *search string*. This is tiny part of the functionality that the original utility offers. mygrep will have the following syntax and options:

```
./mygrep [OPTIONS] <search string>
Options:
-f <file>   Read data from file instead of standard input.
-c          Only count how many lines matched.
-b          The offset in bytes of a matched pattern is displayed in
            front of the respective matched line.
-n          Each output line is preceded by its relative line number in
            the file, starting at line 1.
```

```
-i          Perform case insensitive matching. By default, mygrep is
            case sensitive.
-h          Print this help message.
```

Examples:

- `./mygrep char < mygrep.c` search and print the lines from standard input containing the string "char". In this case, stdin is taken from the "mygrep.c" file
- `./mygrep -f Makefile grep` search and print the lines in file "Makefile" that contain the string "grep"
- `./mygrep -c -f mygrep.c static` search the file "mygrep.c" for lines that contain the string static and print their number

Permitted Functions

You can only use the following C functions to develop mygrep: `getopt(3)`, `printf(3)`, `fprintf(3)`, `exit(3)`, `getline(3)`, `free(3)`, `fwrite(3)`, `perror(3)`, `fclose(3)`, `toupper(3)`, and `tolower(3)`.

Remember to use the `man` command to learn how to use these functions.

5 Evaluation

We will develop most of mygrep during the class. You can add support for the "-i" "-b", and "-n" options on your own to receive bonus credit for the class (as described in the syllabus). For each, of the three options that you support correctly, you will receive 5 points, for a total of *15 points*. It is expected that your mygrep correctly implements all other functionality that we will develop in-class. Submissions that do not support it will get 0 points.

6 Handin Instructions

Login to gradescope and select course CS-392-A. Click on the assignment "In-class01 -mygrep" and upload you mygrep.c file. You can resubmit as many times as you want, the staff will grade the last version of your submission. Beware, if your last submission is after the due date, the lab will not be graded and you will not get any bonus points.

Late submission is not allowed, no grace days will be deducted and no late penalties apply.