Department of Computer Engineering
University of Peradeniya
Lab 04

Programming Methodology

April 17, 2018

1 Introduction

asciidraw is a command line tool that you are going to develop to draw various shapes using ASCII characters. We will start by implementing part of the tool. During this lab, you are expected to implement **asciidraw** to print two figures in the linux terminal, a donut and an 8×8 checkerboard.

In the linux terminal, we can print characters with different colors in colored background, which are typically utilized to show errors/warnings and success messages. In this lab, we will explore this feature with your knowledge in arrays, loops and condition checking to print two colored figures in the linux terminal.

The program you are going to develop (**asciidraw**) is a command line tool that takes some arguments to decide which figure to print. The argument convention is defined as follows,

When you want to print the checkerboard,

```
$./asciidraw checker <background-color> <foreground-color>
```

When you want to print the donut,

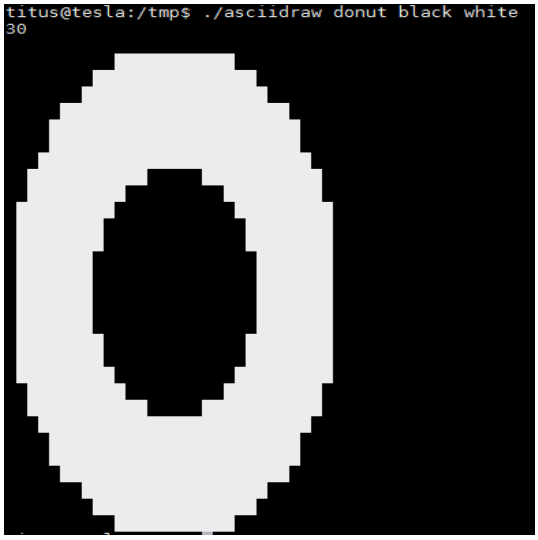
```
$./asciidraw donut <background-color> <foreground-color>
```

If the command line argument is given to print a donut, the program should again show a prompt to enter the diameter of the donut. The number user enters is the outer diameter whereas the inner diameter is half of the outer diameter (your program should calculate the inner diameter).

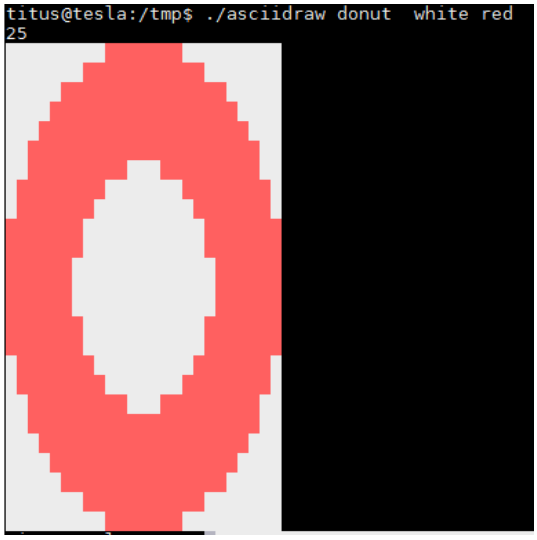
The possible foreground and background colors are listed below:

1. black
2. red
3. green
4. yellow
5. blue
6. magenta
7. cyan
8. white

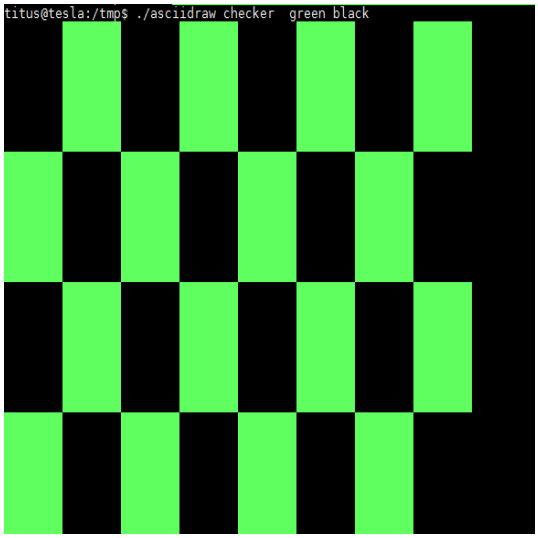
Some example usages are in Fig. 1



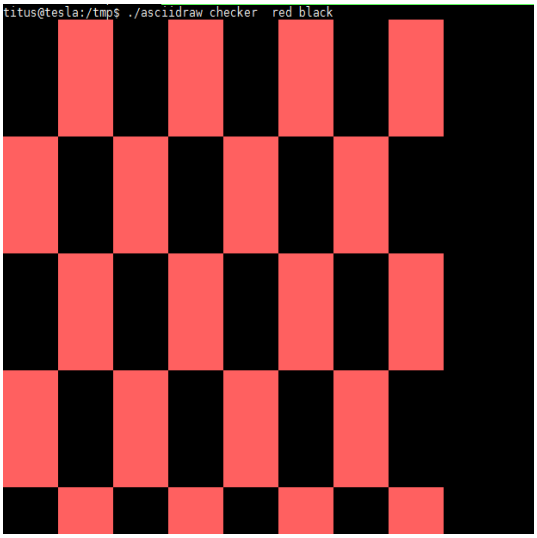
(a) donut



(b) donut



(c) checker



(d) checker

Figure 1: Expected output from your program

2 During the lab

2.1 Familiarize with new concepts

We are using two new concepts in this lab, the first one is getting command line arguments from the user and the second one is how to process them using **string.h** library functions. Few examples will be shown in the lab and you are strongly advised to write your own programs just to make sure you know the concepts before going to implement the lab exercises.

2.2 Handle input errors

There can be many possible ways that the user give you the input which are not compatible with your program. You should try to address all the cases through enforcing a specific pattern to the user. If the user does not follow the pattern, you may simply exit the program after printing an appropriate error message. If you observe the given test program (**asciidraw**) by giving different

kinds of inputs, it will show you what are the error messages you should follow. You must print the exact error messages for each erroneous input (finding them all is up to you).

2.3 Write simple programs first

You are strongly advised to write simpler programs (use hardcoded values and print using only spaces and *s without any colors) which would produce a similar output. Then improve the program upto the level of using variable size (for the donut) and colors.

3 Submission

Submit a single zip file (rename it as lab04.zip) containing only your source code. Rename your source code to the following pattern where xxx is your registration number.

15xxxlab04.c

4 Important

You may get help from your partner if you do not understand any concept or you are stuck but you should write the program individually because we mark the final submission individually, and under no circumstance, you should copy somebody else's code. Copying someone else's code (including your group mate's) or showing your source code to anyone else will earn you zero mark for the whole lab exercise.

5 Deadline

The deadline for the submission is Sunday (22nd April 2018) 23:55h.

6 Fun things to do

1. Extend **asciidraw** to print other shapes.
2. Using lab03 reader program, write a program that will print a small image on the terminal using black and white pixels.
3. Extend **asciidraw** to print a banner with colored text (Hint: you may use the linux banner command).

7 References

- https://www.tutorialspoint.com/c_standard_library/c_function_strcmp.htm How to compare two strings.
- https://en.wikipedia.org/wiki/ANSI_escape_code ANSI escape codes.