

# 15-110: Principles of Computing, Spring 2018

## Lab 1 – Thursday, January 18

### Goals

- Go over lab rules and course resources (website, Piazza)
- Learn basic terminal commands
- Create two text files with "solutions" to an "assignment" in a private lab directory, zip the files into one compressed file and submit the zip file to Autolab successfully

### Lab Rules & Course Resources

- **Important Rules for All Labs**

**You must attend your lab section and submit your work during the lab in order to receive a credit.** You cannot attend another lab section for credit and you are not allowed to submit your work from elsewhere (e.g., your dorm room). If you make a submission before or after your own lab section, you will receive a 0. We want you to go to labs as you will get additional information from your TA, and you will be able to share ideas and learn how to solve problems more effectively by working with other students. Moreover, since the lab exams will be run on the Linux machines, attending labs is important for you to familiarize yourself with the environment.

You are allowed to **drop 2 labs without penalty**, so please do not ask for makeups. Look ahead of your schedule to see if you will be missing a lab due to another event. When you drop a lab, you are still responsible for reviewing the materials that were covered. Note that you are not allowed to drop the lab exams, so you must be present for those.

Please **log out** of your machine when you finish the lab. Do not turn off the machine, lock the machine, or switch users.

- **Course website and Piazza**

The course website has all information for this course: <https://www.cs.cmu.edu/~15110>  
Go to this website and look at the headings.

One of the resources is Piazza, an online Q&A system where you can post questions, and get announcements and help about this course, 24 hours/day. If you are registered for this course, you will be entered added to our course on Piazza based on your Andrew id, and you should receive an email invitation to log in. Look for this email invitation in your inbox (including in your spam folder). Visit Piazza regularly for extra help. Your TA will briefly show you Piazza, explain what is appropriate and inappropriate to post.

# Lab Activities

## Introduction to Terminal

You're used to interacting with your computer or smart device using a mouse, menus and even hand gestures through a graphical user interface (GUI). However, sometimes you need to tell the computer exactly what to do using text (commands). Terminal is an interface in which you can type and execute text based commands. In some cases, it can be much faster to complete some tasks using the terminal than with graphical applications and menus. Another benefit is allowing access to many more commands and scripts.

Your TA will show you how to open the Terminal application on the Linux machines. Once it opens, you will be in your account in your home directory (note: directory = folder).

## Basic Commands

**ls** list all files or directories in the current directory (folder)

```
-bash-4.2$ ls
Applications  Documents      Movies      Pictures    Public      www
bin           Downloads     Music       private     Templates
Desktop       Library       perl5       public     Videos
```

**pwd** print your working directory (displays current directory)

```
-bash-4.2$ pwd
/afs/andrew.cmu.edu/usr8/andrew_id
```

**cd** *directory* change into the specified directory from your current directory

```
-bash-4.2$ cd private
-bash-4.2$ pwd
/afs/andrew.cmu.edu/usr8/andrew_id/private
```

**cd ..** change to parent directory (move up a directory)

```
-bash-4.2$ cd ..
-bash-4.2$ pwd
/afs/andrew.cmu.edu/usr8/andrew_id
```

**mkdir** *directory* make the directory (folder) in the present working directory

```
-bash-4.2$ cd private
-bash-4.2$ mkdir lab1
-bash-4.2$ cd lab1
-bash-4.2$ pwd
/afs/andrew.cmu.edu/usr8/andrew_id/private/lab1
```

**NOTE: If you ever get lost in your directories, you can always type the command `cd` by itself to return to your home directory.**

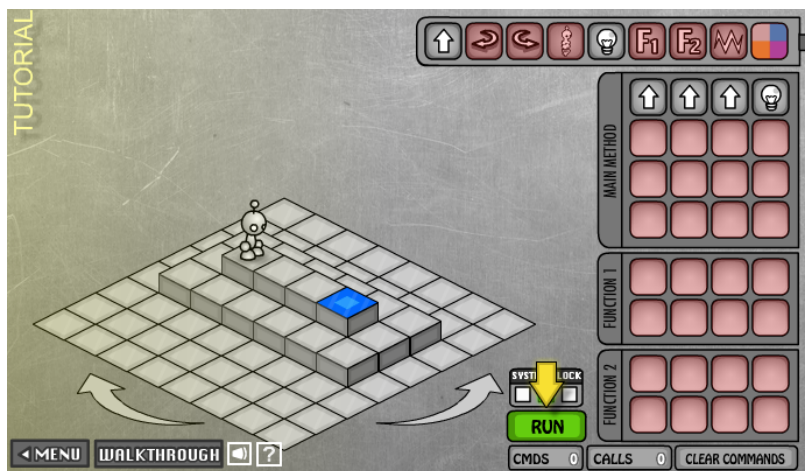
If you followed the examples above, you should be in a `lab1` directory (folder) in your private directory in your account. You should always do all of your work in your account in your private folder, which is protected from others viewing your work as its default.

To create or edit a file in your current directory, you can use a number of text editors. One we will introduce to you in lab is called `gedit`:

**`gedit file_name &`** create a file called `file_name` using `gedit` in the current directory while allowing you to interact with `gedit` and the terminal simultaneously

```
-bash-4.2$ pwd
/afs/andrew.cmu.edu/usr8/andrew_id/private/lab1
-bash-4.2$ gedit lightbot1.txt &
```

1. Consider the following LightBot puzzle:

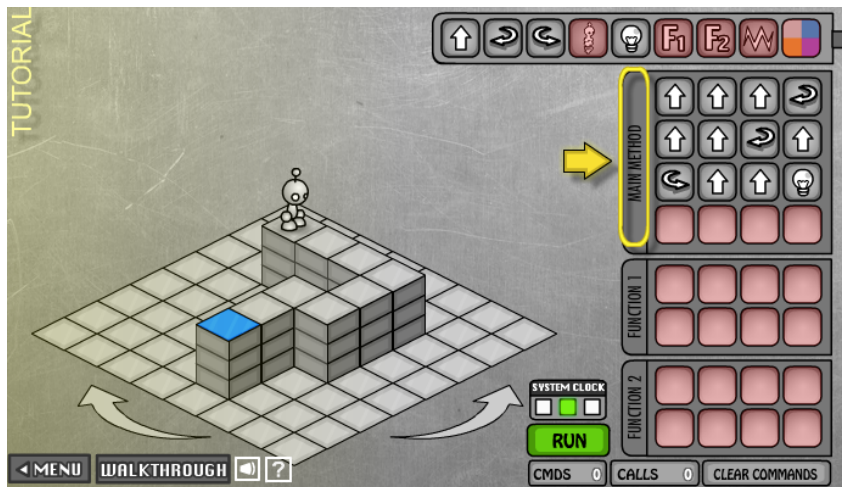


To solve this, LightBot has to move forward three steps and then light the square. We could write this so it looks like a "program" as follows (indent the commands 4 spaces in):

```
def lightbot1():
    forward()
    forward()
    forward()
    light()
```

Enter this "program" into the text file `lightbot1.txt` using `gedit` and save the file in the present working directory. The TAs will show you how to do this. Once you have yours done, lean over to your neighbor and help him or her enter and save their file also.

2. Consider the following more complicated LightBot puzzle:



To solve this, LightBot has to move forward three steps, turn right, move two steps forward, turn right again, move one step forward, turn left, move two steps forward and then light the square. We could write this so it looks like a "program" as follows (indent the commands 4 spaces in):

```
def lightbot2():
    repeat 3 times:
        forward()
    right()
    repeat 2 times:
        forward()
    right()
    forward()
    left()
    repeat 2 times:
        forward()
    light()
```

Enter this "program" into the text file `lightbot2.txt` using `gedit` and save the file in the present working directory. Once you have yours done, lean over to your neighbor and help him or her enter and save their file also.

3. Exit out of `gedit`. You should now have two files in your private `lab1` directory:

```
-bash-4.2$ pwd
/afs/andrew.cmu.edu/usr8/andrew_id/private/lab1
-bash-4.2$ ls
lightbot1.txt  lightbot2.txt
```

**You are now ready to hand in your work on Autolab.**

## Submission – Using Autolab

In order to hand in your lab work as well as your programming assignment work, you need to compress (zip) your folder that contains your answers.

From your lab1 directory, go up one directory to its parent directory:

```
-bash-4.2$ pwd
/afs/andrew.cmu.edu/usr8/andrew_id/private/lab1
-bash-4.2$ cd ..
-bash-4.2$ pwd
/afs/andrew.cmu.edu/usr8/andrew_id/private
-bash-4.2$ ls
lab1
```

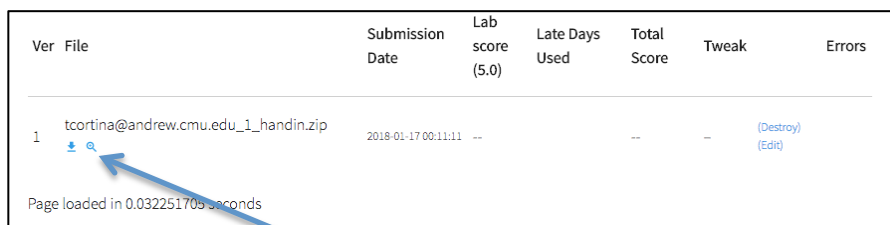
To create a zip (compressed) file with the contents of your lab1 directory, enter the following command once you are in the private directory (not the lab1 directory):

```
-bash-4.2$ zip lab1.zip lab1/*
  adding: lab1/lightbot1.txt (deflated xx%)
  adding: lab1/lightbot2.txt (deflated xx%)
-bash-4.2$ ls
lab1      lab1.zip
```

You now have your zip file that you can hand in.


Log in to `autolab.andrew.cmu.edu` and navigate to **15-110 Principles of Computing (s18)**. (If you are registered for this course, you will be able to log in. If not, alert your TA.)

Click on lab1 and you will see a place where you can submit. Read the integrity policy text and check that box, and then click SUBMIT. You will be asked to select a file to submit. Choose the lab1.zip file you just created. If you do this successfully, you'll see something like this, with your own andrew id:



Ver	File	Submission Date	Lab score (5.0)	Late Days Used	Total Score	Tweak	Errors
1	tcortina@andrew.cmu.edu_1_handin.zip	2018-01-17 00:11:11	--	--	--	--	(Destroy) (Edit)

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Click on the magnifying glass  to see the files you submitted. You should see `lightbot1.txt` and `lightbot2.txt`. Click again on one of the magnifying glasses to see that your "program" is there for each file. If so, you did it! You're done! **Show your TA before you log out.**