Homework 1: Learning About Open Source*

Summary and Motivation

This first homework assignment asks you to read a bit about the concept of **open source**, and you might be wondering why, since this course is primarily about algorithms and data structures. There are several reasons:

- Even though open source software has been around for a long time, in recent years more and more companies, organizations, and governments are adopting it and are expecting their prospective employees to be familiar with the concepts of open source software (and data, for that matter.)

- All of us owe a debt of gratitude to the open source movement and should know something about it, as part of our professional background. We use it all of the time and it powers our everyday lives, our work environments, and our personal environments. For example, *Firefox*, *Chrome*, *Eclipse*, *Android*, *Apache, MySQL*, *Fedora*, and *Ubuntu* are all open source software. The entire INternet was built on the free and open source operating system, UNIX, as the original routers were pared down UNIX systems. Even Microsoft has embraced it and incorporated it into some of its products. The security protocol that currently protects the Internet (*OpenSSL*) is also open source.

- As we study object oriented programming and algorithms in C++, we need to look at actual examples of code to fully understand the ideas. Artificial examples and very small programs often fail to convey the significance of a concept or the details of its use in "real" software. "Real" proprietary software (owned by private companies) cannot be read by anyone outside of the company, but open source software can. The fact that there are real, working applications whose source code can be read gives us the means to further our understanding of what we do in the classroom. It is therefore important to be able to navigate sources of open source software.

You can read more about open source becoming main stream in some relatively recent news articles.

- 9 Biggest Open Source Stories of 2015
  http://www.cio.com/article/3017996/open-source-tools/9-biggest-open-source-stories-of-2015.html

- The Rise of Open-Source Platform
  http://www.enterprisetech.com/2015/11/12/the-rise-of-the-open-source-platform/

- Open Source Won. So Now What?
  http://www.wired.com/2016/08/open-source-won-now/

- David A. Patterson, Computer Science Education in the 21st Century. Commun. ACM 49, (3): 27-30 (March, 2006),
  http://goo.gl/400cMX

Instructions

1. Read the following articles:

   - What is open source? http://goo.gl/imkU6D
   - Six misconceptions about open source software: http://goo.gl/7DHMhQ
   - Contributing to open source without being a programming genius or a rock star: https://goo.gl/xrgYHi

---

2. Answer the following questions. Your answers need to be typed and submitted in **PDF** format. (Submission instructions are at the end of this document.)

- The phrase, "the open source way" has a very specific meaning. Describe a project or activity not involving software that is an example of the open source way.

- How do open source licenses differ from proprietary licenses?

- What is a "ticket" in the context of open source software? Explain how someone can help a project with its tickets.

- The "free" in the phrase, "free and open source software," doesn't mean *free of charge*, as in free beer. This is only one of the misconceptions many have about free and open source software. Briefly describe two other misconceptions.

- How do open source software principles apply "beyond software"?

- List five ways in which one can contribute to open source sofwtare projects without writing any code.

Grading Rubric

This homework is graded on a 0-3 scale (0 = no submission; 1 = homework submitted, but much is incorrect or not thoughtful; 2 = homework submitted, but some answers are incorrect or not much effort was put into them; 3 = homework submitted and everything is correct).

Submitting the Homework

This assignment is due by the end of the day (i.e. 11:59PM, EST) on **Wednesday**, **September 6, 2017**. You are not handing it in on paper, but depositing it into a specific directory on our file system, as I now explain.

There is a directory in the file system of the CSci Department network whose full path name is

/data/biocs/b/student.accounts/cs235_sw/hwks/hwk1.

You are to put the PDF file containing the *questions and your answers* into this directory by running a command that I have written for this purpose. The command's name is `submitpdf` and it requires two arguments: the number of the assignment and the pathname of your PDF file. For example, if your username on our system is `Bugs.Bunny` and your PDF is named `my_answers.pdf` and it is in your current working directory (say your home directory) then you would type

/data/biocs/b/student.accounts/cs235_sw/bin/submitpdf 1 my_answers.pdf

The command will create the file

/data/biocs/b/student.accounts/cs235_sw/hwks/hwk1/hwk1_Bugs.Bunny.pdf.

You will not be able to read this file, nor will anyone else except for me. If you decide to make any changes and resubmit, just run the command again and it will replace the old file with the new one. Do not try to put your file into this directory in any other way - you will be unable to do this. To verify that the command really did work, you can list the contents of the directory using the ls -l command:

ls -l /data/biocs/b/student.accounts/cs235_sw/hwks/hwk1

You should see your file there.

Since it is a bit inconvenient to type the full pathname of the command `submitpdf`, you can modify the `PATH` variable in your `.bashrc` file as follows:

Edit the `.bashrc` file by adding the following lines at the end of the file:

```
if [ -d /data/biocs/b/student.accounts/cs235_sw/bin ]; then
    PATH=$PATH:/data/biocs/b/student.accounts/cs235_sw/bin
    export PATH
fi
```

Save the changes, and source the file by typing the command

```
. ~/.bashrc
```

(yes, that is a period followed by the string `~/.bashrc`). Then whenever you want to run the `submitpdf` command you can type, for example, the much simpler

```
submitpdf 1 my_answers.pdf
```

to submit a file named `my_answers.pdf` as the solution to assignment 1.

WARNING: You must be on a cslab host to do this. It will not work from eniac or any other computer!