



# 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. The first is that, 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.)

A second reason is that 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 security protocol that protects the Internet (*OpenSSL*) is also open source.

A third reason is related to the following problem. As we study object oriented programming, data structures 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 the concept or the details of its use in “real” software. “Real” software that is proprietary (owned by private companies) cannot be viewed 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.

You can read more about open source becoming main stream in some 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>
- How computer coding can increase engagement, provide a purpose for learning <http://goo.gl/uLlFuF>

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.)

- What is meant by the phrase, “the open source way”?

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- How do open source licenses differ from proprietary licenses?
- Open source software is important to everyone, even non-programmers. Give two examples that show how open source software benefits someone other than a programmer.
- Give two examples that explain why (some) programmers prefer to use open source software.
- 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”?
- How do FOSS and HFOSS differ?

## Grading Rubric

This homework is graded on a 0-3 scale (0 = no submission; 1 = homework submitted, but mostly incorrect; 2 = homework submitted, but there are some problems; 3 = homework submitted and correct).

## Submitting the Homework

This assignment is due by the end of the day (i.e. 11:59PM, EST) on September 5, 2016. Note that this is Labor Day and we have no class. You are not handing it in on paper, but depositing it into a particular directory on our file system, as is now explained. There is a directory in 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 program that I have written for this purpose. The program’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 program 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.

If you modify your `.bashrc` file so that the path variable contains `/data/biocs/b/student.accounts/cs235_sw/bin`, then you can type the simpler command

```
submitpdf 1 my_answers.pdf
```

The edit in the `.bashrc` file is to add 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
```