**06 – Software Licensing and FOSS**

**Activities**

COMP190 – Tools and Techniques for Software Development

Dickinson College

**Name:**

Top of FormThis week’s class begins a new topic on Free and Open Source Software (FOSS). Undoubtedly you are familiar with proprietary software, in which you purchase a license to use the software but are forbidden from many other uses of it (e.g. you can’t give a copy to a friend). Earlier in the course we briefly encountered the idea of Free Software and its *four freedoms*. In this set of activities, we’ll take a closer look at the foundations of intellectual property (IP) that underly software licensing. We will differentiate copyright protection from patent and trademark protection and come to understand how software licenses, and FOSS licenses in particular, are related to copyright. Finally, you’ll get familiar with a few different types of FOSS licenses, explore their implications and investigate the licensing of some different FOSS products.

**Intellectual Property:**

Watch the video *Bottom of FormIntellectual Property* produced by Durham University in the UK. This introduction covers intellectual property from the UK perspective, but the main concepts are similar to ones that exist in most other countries – though the specific mechanisms sometimes differ (e.g. the UK Design Rights she mentions are protected by Design Patents in the US.)

* <https://www.youtube.com/watch?v=EQsZf2G4Sdc> (5:51)

1. The video identifies the four categories of IP protection described below. For each of these four types of IP protection briefly state, in your own words:

* The purpose of that particular IP protection (i.e. what type of IP is it designed to protect).
* The requirements for receiving that protection (i.e. what if anything must you do for your IP to be protected by it).
* Give a few examples of things (different from those in the video) that are protected by that type of IP protection.

a. Trademarks:

i. Purpose

ii. Requirements

iii. Examples

b. Copyright:

i. Purpose

ii. Requirements

iii. Examples

c. Patent:

i. Purpose

ii. Requirements

iii. Examples

d. Design Rights:

i. Purpose

ii. Requirements

iii. Examples

The following are not required viewing. However, if you are interested or still a little confused about the different types of IP protection, you might find these additional sources from United States Patent and Trademark Office interesting and useful for differentiating the main types of intellectual property:

* Trademark, Patent, or Copyright? A document and embedded video (8:37) that covers the basics of Trademarks, Patents and Copyrights and the differences between them.
  + <https://www.uspto.gov/trademarks-getting-started/trademark-basics/trademark-patent-or-copyright>
* Supervisory Patent Examiner Gwendolyn Blackwell gives a longer and more detailed overview of Patents, Trademarks, and Copyrights: An overview of intellectual property
  + <https://www.youtube.com/watch?v=nXyCyWg6x98> (43:16).

2. For each of the following examples identify the type of IP protection that would most likely apply: patent, trademark, copyright or design right.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  | **Example** | **Type of IP Protection** |  |
|  | **a** | The company name Tesla Motors |  |  |
|  | **b** | The idea for a new machine for extracting energy from food waste. |  |  |
|  | **c** | A clever new handle shape for a can opener that makes it easier to use. |  |  |
|  | **d** | The song The Blues are Alive and Well on Buddy Guy’s 2018 album. |  |  |
|  | **e** | A new process for ordering internet search results. |  |  |
|  | **f** | The bash script that you wrote at the end of A04 in this course. |  |  |
|  | **g** | The jingle “I’m Lovin’ it” from McDonald’s commercials. |  |  |
|  | **h** | The theme song “I’ll Be There for You” from the TV show Friends. |  |  |
|  |  |  |  |  |

**Software - Copyrights and Patents:**

Software is an interesting case when it comes to copyrights and patents. A program is a fixed tangible expression of a creative work. This makes it similar to other creative works like books, plays, musical scores or performances, etc, that are protected by copyright. However, a program also embodies a process for completing a task, which if new and of commercial value can be protected by a patent.

3. Copyright protection plays a particularly important role in software licensing and FOSS. To better understand that connection and eventually its relationship to patents, answer each of the following questions with regard to copyright:

a. At what point does the creator of a piece of creative work become the copyright holder for that work?

b. Is it required that a creator of a work register their work in order to hold the copyright to it?

c. How long does a copyright last?

d. What advantage is there to registering the copyright for a piece of work as compared to simply holding the?

e. What must happen in order for anyone other than the copyright holder to be allowed to use a piece of copyrighted work? (I.e. To perform the play, show the painting or photograph, publish the book, or use the program statements?) Note: If you are familiar with “fair use” this question is not asking about those exceptions.

Sometimes the distinction between copyright and patents can be confusing with respect to software. Watch the video *Protecting Software: Patents vs. Copyrights* from the University of Michigan Engineering channel. It does a good job of discussing the differences between patents and copyrights on software. Use the contents of the video to answer the questions below.

* <https://www.youtube.com/watch?v=uGzrgMIXLpk> (3:53)

4. Imagine that you have written a really innovative piece of software that does something new:

a. Which type of IP protection automatically applies to your source code the moment you complete writing it?

b. Which type of IP protection can be used to prevent others from using your source code in another application without your permission?

c. Which type of IP protection would you need to obtain in order to prevent someone from independently creating their own software that does the same thing as yours?

5. OpenOffice ([www.openoffice.org](http://www.openoffice.org)) and LibreOffice ([www.libreoffice.org](http://www.libreoffice.org/)) are FOSS projects that essentially duplicate the functionality provided by Microsoft’s Office Suite. Explain in terms of IP protections why these FOSS projects are allowed to create these products.

**Free and Open Source Software:**

At the end of the first video you watched on intellectual property she asks the question “What would be the point of having a good idea if anyone could take it?” It would seem that if the answer to that was really that there is no point, then FOSS would not exist. But let’s dig a little deeper to understand FOSS and why its advocates believe that it is the right way to develop software.

To begin deepening your understanding of open source software read the article *What is Open Source* from Opensource.com and then answer the questions below.

* <https://opensource.com/resources/what-open-source>

6. Both proprietary and open source software have licenses, but the purpose of the license for these two classes of software is quite different. Respond to the following two prompts with a few sentences of your own words based on the content of the article.

a. Summarize the purpose of the license for proprietary software.

b. Summarize the purpose of the license for open source software.

7. The article discusses five reasons that advocates of open source software prefer it to proprietary software. List these five reasons and then pick one that appeals to you. Briefly summarize the reason you picked using your own words and then describe why you find it appealing.

8. Most open source licenses allow or require that the source code be available for free. That leads many people assume that companies cannot make money from open source software. The above article addresses this position. Briefly describe least one way in which a company might build a successful business around open source software.

9. The article talks about how open source values and principles have value beyond the world of software. Briefly summarize at least one way that you think an open source “attitude” would have value beyond software.

**Extra Readings:**

The readings in this section are optional, but if you are interested or want to dig deeper, they are good resources for learning more about Free and Open Source Software.

We have been using the term Free and Open Source Software (FOSS) as an umbrella term for both *Free Software* and *Open Source Software*. Free software and open source software are very similar ideas and nearly all free software is open source software and vice versa. However, the philosophies that underly these two types of software are different, and some world argue essential.

The following readings shed some light on the philosophical difference between Free Software and Open Source Software:

* *What is Free Software* from the Free Software Foundation (FSF) discusses the four freedoms we learned about earlier in much more detail.
  + <https://www.gnu.org/philosophy/free-sw.en.html>
* *The Open Source Definition* from the Open Source Initiative defines what open source software is and can be compared to the FSF definition of free software.
  + <https://opensource.org/docs/osd>
* The article *Why Open Source misses the point of Free Software* by Richard Stallman discusses the differences in values and philosophical underpinnings between free software and open source software.
  + <https://www.gnu.org/philosophy/open-source-misses-the-point.html>

The earlier article on What is Open Source hinted that there are common misunderstandings that people have about FOSS when they first encounter it (e.g. it just means free of charge). If you are curious about how people often misunderstand open source, want to broaden your understanding of FOSS, or avoid these misconceptions yourself, check out the article *Six misconceptions about open source software* by Dave Kelly and Cody Van De Mark:

* <https://opensource.com/education/12/7/clearing-open-source-misconceptions>

**Open Source Software Licenses:**

The article you read in the previous section (What is Open Source?) claims that open source licensing promotes collaboration and sharing because “its authors make its source code available to others who would like to view that code, copy it, learn from it, alter it, or share it.” Now recall (See 3a and 4a) that an author automatically holds the copyright on any software they produce. Thus, to make it legal for others to copy, alter, share (and more) their software they must explicitly allow it (See 3e). A software license, and a Free and Open Source Software license in particular, are is mechanism by which the author of a piece of software, the holder of its copyright, can allow others to copy, alter and share it. Without this license, anyone doing so would be infringing on the author’s copyright.

It is not required reading, but if you would like to read a little more about FOSS licenses before (or after) attempting the following questions the short article What are Open Source Licenses from the FOSSA blog gives a good overview:

* <https://fossa.com/blog/what-do-open-source-licenses-even-mean/>

10. What are the two broad classifications of Free and Open Source software licenses? Briefly explain their similarities and differences in a few sentences of your own words.

11. In class we looked at some Free and Open Source Software licenses. We identified the permissions that they granted, the requirements they make in order to receive those permissions and whether they were permissive or copyleft. This question asks you to consider some other popular FOSS licenses.

a. Consider the text of the *BSD 3-Clause License:*

* + <https://tldrlegal.com/license/bsd-3-clause-license-(revised)#fulltext>.

Is the BSD-3 Clause License a permissive or a copyleft license? Explain your reasoning and support it with evidence from the license.

b. Consider the *Eclipse Public License*:

* + <https://tldrlegal.com/license/eclipse-public-license-1.0-(epl-1.0)#fulltext>

Focus in on sections 2 and 3 which outline the granting of rights and the associated requirements that must be met in order to receive them.

Is the Eclipse Public License a permissive or a copyleft license? Explain your reasoning and support it with evidence from the license.

12. While permissive and copyleft licenses provide very similar permissions (e.g. the four freedoms), as you have seen that they place different requirements on the recipient in order to receive those permissions. These different requirements present unique challenges when code from a project with one license is incorporated into a project with a different license. This issue is so common it has its own name, *license compatibility*. To do a full legal analysis of the compatibility of licenses is well beyond our goals here. But the following questions will give you a feel for the types of issues that arise when you combine code that has been released under different licenses.

a. Do you think it would be permissible to incorporate code released under an MIT license into a program that will be released under a GPL3 license? Briefly explain your reasoning.

b. Do you think it would be permissible to incorporate a fragment of code that was copied from stack overflow, and thus under a cc-by-sa license, into a program that will be released under an BSD 3-Clause license? Briefly explain your reasoning.

**Licenses in the Real World:**

If you have spent more than three hours on this assignment already, you may skip this exercise.

13. In an earlier set of activities you installed a number of different pieces of software onto your LinuxLite distribution. For each of the following give the name of the license that is used and indicate if it is a permissive license, a copyleft license or something else. I found that the Wikipedia pages for these products were a pretty quick and easy way to get an idea about how each was licensed. You can use additional web searches to find out if given license is considered permissive or copyleft or something else.

a. LinuxLite

b. The Eclipse IDE

c. The Apache Web Server

d. The Open JDK

e. The Chrome Web Browser

**Optional:** To help us improve and scope these activities for future semesters please consider providing the following feedback.

a. Approximately how much time did you spend on this activity outside of class time?

b. Please comment on any particular challenges you faced in completing this activity.

**Acknowledgements:**

Some materials, questions and resources have been adapted from activities posted on foss2serve.org.

* <http://foss2serve.org/index.php/Intro_to_Copyright_and_Licensing_(Activity)>
* <http://foss2serve.org/index.php/Choosing_A_License>
* <http://foss2serve.org/index.php/Finding_The_License>
* <http://foss2serve.org/index.php/Understanding_Creative_Commons>
* <http://foss2serve.org/index.php/Understanding_the_Open_in_Open_Source_(Activity)>
* <http://foss2serve.org/index.php/Open_Vs_Proprietary_Mock_Debate>