

## Podcast series

# A Guide to Free and Open Source Software

## Episode 1: Basics of Free and Open Source Software

### Introduction

Hello and welcome to the podcast of CCdigitallaw. This episode is about free and open source software and its licenses. I am your host, Melanie Graf. I am a legal counsel at the university library of Basel and a member of CCdigitallaw. I am specialized in free and open source software licenses and more generally in intellectual property law in the context of new technologies.

This series on free and open source software is split into four parts, each one focusing on a specific aspect of free and open source software.

### Free and Open Source Software

This first part is an introduction to the basics of free and open source software.

First: what is free and open source software? Simply put, it is a software that anyone is allowed to use, study, copy and share as well as modify and share the modified versions. Many of you use free and open source software every day.

For example the Mozilla Firefox Browser and much of the Android operating system on your smartphone. Further examples are GNU/Linux Operating Systems, WordPress, LibreOffice, OpenOffice, the VLC-Media-Player, Mozilla Thunderbird, and many more.

To show you what makes computer programs free and open source software in more detail, I will answer the question: how to make free and open source software?

Basis of every software is a written code. Computer programs are a set of encoded instructions that a computer can execute. So, to make free and open source software you first have to write these encoded instructions.

## Technical Basics of Software

Nowadays most computer programs are written in so called *source code*. An example of source code that you may heard of is the if-then argument. Let's say you write a computer program to send and receive emails and you want the computer to show an symbol of a letter when a new email is received. So you write in the source code file of your email program: *if* the email program receives an email, *then* show a little icon of a letter in the corner of the computer display.

Of course this not an exact example, it is just to show you that the source code is almost plain text. It is understandable for humans or at least for programmers that know the programming language.

After you have written all your instructions, you have many text files with human-readable source code saying that if an email is received then the computer has to show a letter symbol. But there is a problem: your computer does not understand source code you have written. Your computer only understands ones and zeroes, it does not understand text nor does it understand letters. So your computer is not able to execute your instructions that you wrote in source code. Therefore, you let another computer program translate your source code into machine readable ones and zeroes. This code of ones and zeros is called *object code*. So now then statement from before is translated into many many many zeroes and ones. Now your computer can understand your instructions and when you run your object code of ones and zeroes on your computer and you receive an email, then your computer will show a little letter symbol. So congratulations, you have successfully written a computer program.

2 Now you give your friend a copy of your machine readable object code. Does this mean that your email program is free and open source software? No, it's not. Your friend is able to run the program, *but not to study or change* your email program, because your friend only has a copy of your object code with ones and zeroes. It is extremely hard for humans to understand this code and it is very hard and time consuming if even possible to translate ones and zeroes back into human readable source code.

A lot of software is distributed only in the form of machine readable object code. For example, the Windows Outlook email program or Windows Word, or the Apple Operating System and so on. When you buy such programs you only get the machine readable object code. Software that is distributed this way is often called proprietary or closed source or non-free software. But you want to make your program free and open source. Therefore you also give your friend a copy of your human readable source code. Now your friend is able to run your computer program, she now is also able to study your computer program because now she can read your human readable source code. Because she has your source code she is also able to change your computer program. So you see, that to make the source code of a computer program accessible is elementary to make software free and open source.

But is it enough to grant your friend access to your source code to make your email program free and open source? No, your email program is still not free and open source software. Even though your friend is now able to make copies, changes and share your email program with other people, it is illegal for your friend to do so. That is because of copyright law. So let me briefly talk about copyright and computer programs.

## Copyright and computer programs

Both the source code and object code of a computer program are regularly protected by copyright law (sometimes by patent law too). This means that you, as the author of your email program, automatically become the owner of the copyrights of the source and object code that you wrote. This means that you now own a bundle of rights to exclusively use the code you wrote.

There are many of those exclusive rights, but in the context of free and open source software, the three relevant rights of use are:

1. The exclusive right to make copies of the code. For example, you are the only one allowed to copy your code and save it on a USB stick or on a CD, to print your code on paper, or even to copy it by hand writing. This is the exclusive right to copy.
2. The exclusive right to distribute copies of the code. This means you are the only one allowed to - for example - make your code available online for download, sell a CD with a copy of your source, or object code. This is the exclusive right to distribute.
3. Third and last is the exclusive right to modify the computer program you wrote. This means that you are the only one allowed to change or modify your code. For example, you want to add a code to your email program to let your computer make a sound when you receive a new email. You are the only one legally allowed to do that. No one else is: that is the exclusive right to modify.

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Therefore, as the owner of the copyrights of your email program, you are the only one allowed to copy, share, modify and distribute modified versions of your email program. Without consent of the owner of the copyrights - the owner, that is you - everybody else is legally excluded from these uses. So in order to make your computer program free and open source you have to explicitly allow your friend to copy, distribute copies and modify your program. The act of granting such rights to use is called licensing.

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## Summary

To resume, what is a free and open source software?

A free and open source software is - simply put – a software that anyone is able and allowed to use, study, copy and share as well as modify and share the modified versions. The easiest way to do this is to make your source code accessible and license your computer program under an already written free and open source software license, which implements the free and open source software definition. So this was: how to make free and open source software.

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In the next second part of the podcast on free and open source software, I will describe where you can find free and open source licenses and I will explain, the term free and open source software in more detail.

This is it for the first part. If you have any questions or feedback, please write to [info@ccdigitallaw.ch](mailto:info@ccdigitallaw.ch)

## Credits

This script was written by Melanie Graf, a member of CCdigital<sup>law</sup> and a legal counsel at the University Library Basel. Last updated on 02.05.2018.



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