

Open Source SW

Lecture 1

Introduction to Open Source Software

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What is Open Source Software?

- Open Source: Something made freely available for use, modification and redistribution
- Open Source Software (OSS): a computer program in which the source code is available to the general public for use or modification, released under a software license, by the copyright holder

* Source: https://en.wikipedia.org/wiki/Open-source_software

- The term “free software” was used before “open source software”
 - > “free (libre) to use, modify, and distribute”
 - > not necessarily meaning cost-free
- Sometimes called “Free and Open-Source Software (FOSS)”



Misunderstanding on Open Source Software (OSS)

- Open Source Softwares do not have a copyright?
 - > Wrong! OSS have a copyright and protected by the copyright law!
 - > OSS released under Open Source License
 - > If there is no Open Source License, then it is not open source
- Open Source Softwares have no cost?
 - > Wrong! OSS can be used commercially under a certain condition
 - > Business models often include cost regarding management and education on OSS
 - > “Free” as “freedom to use”, NOT as “free lunch”
- Is “Freeware” open source?
 - > Mostly not. Freewares may not open source code, and may not allow distribution or modification on the program.

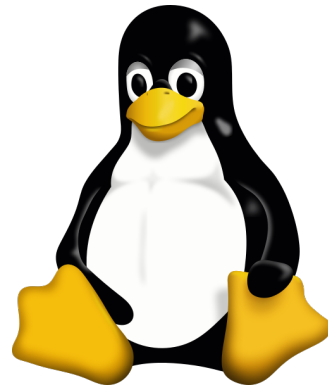


Popular Open Source Softwares

GNU / Linux



<https://www.gnu.org/home.en.html>



<https://www.linux.org/>

Apache Server



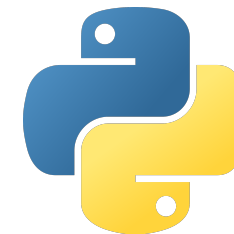
<https://httpd.apache.org/>

Libre Office



<https://www.libreoffice.org/>

Python



<https://www.python.org/>

Mozilla Firefox



<https://www.mozilla.org/en-US/firefox/new/>

Chromium



<https://www.chromium.org/chromium-projects/>



<https://git-scm.com>




















<https://www.android.com/>

Why Open Source Software Matters?

- Impractical to develop every component of software from scratch (time, cost, quality, ...)
- Encourages collaboration worldwide
- Promotes innovation
- Large development community
- Can do business
- Career management and portfolio for software developers
- Reputation and contribution to community and society



Git and GitHub







 gitster The sixteenth batch ...	✓ 6c8e4ee 10 hours ago ⌚ 67,774 commits
 .github	ci: update 'static-analysis' to Ubuntu 22.04 6 days ago
 Documentation	The sixteenth batch 10 hours ago
 block-sha1	block-sha1: remove use of obsolete x86 assembly 6 months ago
 builtin	Merge branch 'jk/unused-fixes' 10 hours ago
 ci	CI: use "GIT_TEST_SANITIZE_LEAK_LOG=true" in linux-leaks last month
 compat	Merge branch 'vd/scalar-generalize-diagnose' 4 days ago
 contrib	Merge branch 'jd/prompt-show-conflict' 10 hours ago
 ewah	Merge branch 'ep/maint-equals-null-cocci' 3 months ago
 git-gui	Merge https://github.com/prati0100/git-gui 2 years ago
 gitk-git	Merge branch 'master' of git://git.ozlabs.org/~paulus/gitk 4 months ago
 gitweb	Merge branch 'jr/gitweb-title-shortening' 24 days ago
 mergetools	mergetools: vimdiff: simplify tabfirst 20 days ago
 negotiator	use CALLOC_ARRAY 2 years ago
 perl	perl Git.pm: don't ignore signalled failure in _cmd_close() 7 months ago
 po	l10n: sv.po: Update Swedish translation (536710f0u) 2 months ago
 ppc	*[ch]: manually align parameter lists 3 years ago

*Source: <https://github.com/git/git>

About

Git Source Code Mirror – This is a publish-only repository but pull requests can be turned into patches to the mailing list via GitGitGadget (<https://gitgitgadget.github.io/>). Please follow Documentation/SubmittingPatches procedure for any of your improvements.

-  Readme
-  View license
-  Code of conduct
-  43.3k stars
-  2.4k watching
-  23.9k forks

Releases

 856 tags

Packages

No packages published



Brief History of Open Source Software

- Free (open) software appeared early in the history of computer software (1960-70s), shared by researchers and organizations
- By 1980s, software increasingly became proprietary
*Source: https://en.wikipedia.org/wiki/Proprietary_software
- Richard Stallman founded the Free Software Foundation (FSF), wrote GNU Manifesto (1985), and initiated GNU Project (GNU: GNU's Not Unix)
- In 1989, FSF released the GNU General Public License (GPL) version 1
- In 1991, Linus Torvalds started the Linux Project, released under GPL
- In 1998, the Open Source Initiatives (OSI) was founded (the term “open” instead of “free”)
- Nowadays, even tech giants (big IT companies) have joined the open source communities, making open source development as a major stream



Richard Stallman and GNU

- Richard Stallman initiated GNU(GNU 's Not Unix) by Free Software Foundation, released under the General Public License (GPL)
- Collection of many free (as “freedom”) programs including Unix-like operating system (GNU/Linux kernel)
- Free Software: “Users have the freedom to run, copy, distribute, study, change and improve software”
*Source: <https://www.gnu.org/home.en.html>
- Four essential freedoms:
 - Freedom 0: to run program for any purpose
 - Freedom 1: to study and change program as you wish (access to the source code is a precondition)
 - Freedom 2: to redistribute copies
 - Freedom 3: to distribute copies of the modified versions
- Copyleft and the General Public License: “GNU is not in the public domain. Everyone will be permitted to modify and redistribute GNU, but no distributor will be allowed to restrict its further redistribution. That is to say, proprietary modifications will not be allowed. I want to make sure that all versions of GNU remain free.”
*Source: GNU Manifesto (1985), Richard Stallman



Linus Torvalds and Linux

- Open-source Unix-like operating systems based on the Linux kernel, first released by Linus Torvalds in 1991
- Kernels, software and libraries connected to GNU
- Popular distributions include Debian, Fedora, and Ubuntu
- Leading OS on servers (over 96.4% of the top 1 million web servers)
- Also runs on embedded systems and mobile systems (Android)
- GNU General Public License (GPL)



Open Source Initiative (OSI)

- Founded by Eric Raymond and Bruce Perens in 1998 focusing on pragmatism and accessibility
- Coined the term “Open Source” (originally suggested by Christine Peterson)
- Open Source Definition (OSD) for OSI-approved licenses:
 1. Free redistribution
 2. Source code
 3. Derived works
 4. Integrity of the author’s source code
 5. No discrimination against persons or groups
 6. No discrimination against fields of endeavor
 7. Distribution of license
 8. License must not be specific to a product
 9. License must not restrict other software
 10. License must be technology-neutral



*Source: <https://opensource.org/>



Open Source Licenses

* Disclaimer: This lecture is not legal advice, and the lecturer is not responsible for any legal issues associated with the provided contents.

- Open Source Software has a copyright, and comes with a license
- An open source license describes how to use, modify, and distribute software, along with conditions to meet and liability statements
- There are some widely-adopted standard open source licenses
- Although a source code is publicly available, it is NOT open source unless it comes with an open source license. That is, you must NOT use any unlicensed source code.
- Check <https://olis.or.kr/license/licenseGuide.do> for further license information.



Open Source License Example in GitHub

The screenshot shows the GitHub repository for TensorFlow. The repository is public and has 134,341 commits. The commit history table lists recent changes, including updates to the TensorFlow package, TFRT dependency, and various configuration files. The right sidebar shows the repository's description, website (tensorflow.org), and a list of tags including python, machine-learning, deep-neural-networks, neural-network, tensorflow, and distributed. The Apache-2.0 license is highlighted in the sidebar.


File	Commit Message	Time Ago
.github	keras_preprocessing is no longer required by the TF package.	13 hours ago
tensorflow	[GML] Inline returningMatchAndRewrite in tiling pass	36 minutes ago
third_party	Update TFRT dependency to use revision	1 hour ago
tools	Merge pull request #25673 from Ryan-Qiyu-Jiang:env_capture_scrip...	3 years ago
.bazelrc	Enable unused-result warning and error for OSS builds.	16 hours ago
.bazelversion	Implements pywrap_tensorflow_macro_opensource using `cc_sh...	4 days ago
.clang-format	[.clang-format] Init @ root	9 months ago
.gitignore	Ignore CoreML BUILD files which are generated by the configure script	2 years ago
.pylintrc	Add soft-link to pylintrc to project root	3 years ago
.zenodo.json	Add .zenodo.json for clean automated DOI numbers.	16 months ago


Source: <https://github.com/tensorflow/tensorflow>

Also search for README, comments in source code, and a separate web page describing a license



Open Source License Example in GitHub

 master ▾ tensorflow / LICENSE Go to file ...



tensorflow/tensorflow is licensed under the **Apache License 2.0**

A permissive license whose main conditions require preservation of copyright and license notices. Contributors provide an express grant of patent rights. Licensed works, modifications, and larger works may be distributed under different terms and without source code.

Permissions

- ✓ Commercial use
- ✓ Modification
- ✓ Distribution
- ✓ Patent use
- ✓ Private use

Limitations

- ✗ Trademark use
- ✗ Liability
- ✗ Warranty

Conditions

- ⓘ License and copyright notice
- ⓘ State changes

This is not legal advice. [Learn more about repository licenses.](#)

251 lines (205 sloc) | 13.3 KB

```
1                Apache License
2                Version 2.0, January 2004
3                http://www.apache.org/licenses/
4
5    TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION
6
7    1. Definitions.
8
9        "License" shall mean the terms and conditions for use, reproduction,
10       and distribution as defined by Sections 1 through 9 of this document.
11
```

... omitted the rest part ...

Source: <https://github.com/tensorflow/tensorflow/blob/master/LICENSE>



A Few Open Source Licenses

- GNU General Public Licenses (GPL): Copyleft. Free to use, modify, and distribute, under the condition that any software based on any GPL software must be released as open source (including opening source codes), different versions exist with different details

Source: <https://opensource.org/licenses/gpl-license>

- Berkeley Software Distribution (BSD) Licenses: Free to use, modify, and distribute as long as the copyright notice, list of conditions, and disclaimer retained. Different versions exist with different details

- 4-clause (original): advertising clause and non-endorsement clause
- 3-clause: removing advertising clause

Source: <https://opensource.org/licenses/BSD-3-Clause>

- 2-clause: removing non-endorsement clause

Source: <https://opensource.org/licenses/BSD-2-Clause>

- Apache License: released by the Apache Software Foundation (ASF). Free to use, modify, and distribute under the condition that noticing copyright, patents, trademark, attribution, etc. Different versions exist with different details

Source: <https://opensource.org/licenses/Apache-2.0>



Comparing Wildely-used Open Source Licenses

	무료 이용 가능	배포 허용 가능	소스 코드 취득 가능	소스 코드 수정 가능	2차적 저작물 재공개 의무	독점 SW와 결합 가능
MIT License	O	O	O	O	X	O
BSD 2-Clause BSD 3-Clause	O	O	O	O	X	O
Apache License 2.0	O	O	O	O	X	O
GPLv2 GPLv3	O	O	O	O	O	X
LGPLv2	O	O	O	O	O	O
MPL	O	O	O	O	O	O

Source: <https://naver.github.io/OpenSourceGuide/book/UsingOss/the-legal-side-of-opensource.html#licensedef>

For further details about open source licenses,
check out the following sites:

<https://olis.or.kr/license/introduction.do>

<https://opensource.guide/legal/>



Contributing to Open Source Software

- Contribution: modification, documentation, editing, comments, and other activities to improve open source software
- Why contributing?:
 - Improve software you use by yourself
 - Improve your coding skills
 - Networking with people of similar interests
 - Career management with growing reputation
 - Open collaboration
- Start your own project!

Source: <https://opensource.guide/how-to-contribute/>



Today's Lab Activity

- Sign up at GitHub
<https://github.com/>
- Search for 5 interesting projects by typing key words in “Search or jump to...”



- Make a list of the 5 repositories, and provide a brief explanation, along with license information

