Session 1- Introduction to Free Software

Time: 1 hour

- Free software- Definition, Origins and History. (10 mts)
- People in free software. (10 mts)
- Difference between the terms opensource and free software. (10 mts)
- Various organizations involved in promotion of Free and Opensource software (10 mts)
- Popular Free Software Licenses: (GPL,AGPL,FDL,MIT,BSD, Apache licenses etc) (10 mts)

Definition of free software, origins and history.

Time : 10 mts

Free software is computer software distributed under terms that allow users to **run** the software for any purpose as well as to **study,change, and distribute it and any modified versions.** The freedom provided is often known as the four freedoms in free software.

- The freedom to run the program as you wish, for any purpose (freedom 0).
- The freedom to study how the program works, and change it so it does your computing as you wish (freedom 1). Access to the source code is a precondition for this.
- The freedom to redistribute copies so you can help others (freedom 2).
- The freedom to distribute copies of your modified versions to others (freedom 3). By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition for this.

In free software, the source code (human readable form as written by the programmer) is readable and modified to use and distributed; whereas in proprietarty software, these rights are denied, and the user is provided only a machine readable format of the software(machine code), which can only be run/executed.

Free software is a matter or liberty, not price: users and computer programmers are free to do what they want with their copies of free software but by preserving the freedom granted.

See Video Link

[https://commons.wikimedia.org/wiki/ File:Free_software,_free_society-_Richard_Stallman_at_TEDxGeneva_2014.webm](https://commons.wikimedia.org/wiki/File:Free_software,_free_society-_Richard_Stallman_at_TEDxGeneva_2014.webm)

Software was not considered copyrightable before the 1974 US Commission on New Technological Uses of Copyrighted Works (CONTU) decided software programs as a subject matter of copyright. This decision and the case ruling of Apple Computer.Inc vs Franklin Computer Corp in 1983 which held that a computer's operating system could be protected by copyright. As an impact of this, binary code ,the machine readable form of software, was copyrightable too in addition to the human-readable source code.

Then general trend began to no longer distribute source code, and only distribute machine code. Richard Stallman who was working at MIT at that time was concerned that he could no longer study or modify programs initially written by others and found that this practice was ethically wrong. To counter this, he founded the **GNU** project to create a UNIX-like OS in 1983. He later founded the **Free Software Foundation** in **October 4 1985.**
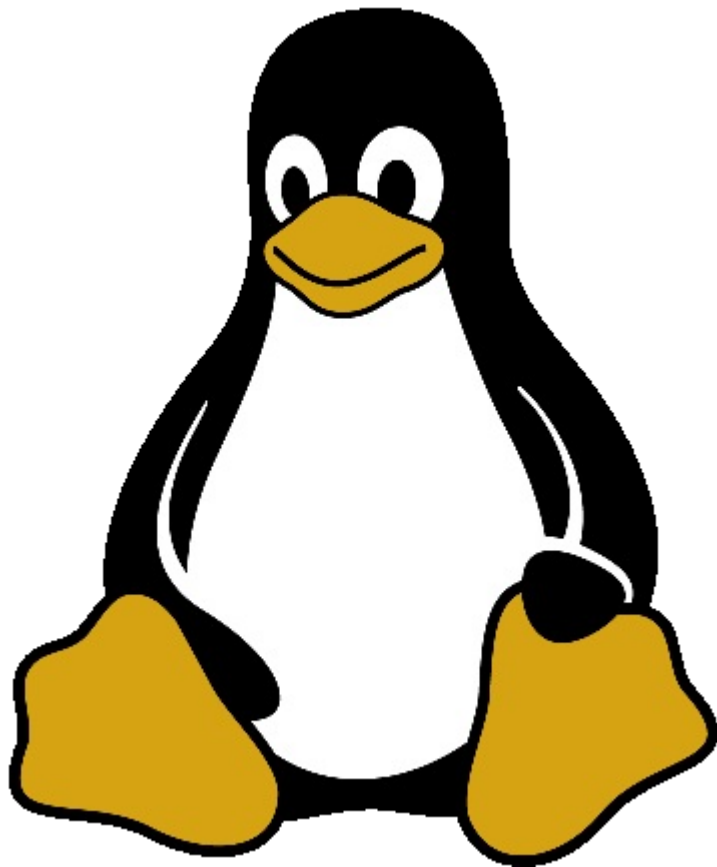
The GNU Logo

The FSF Logo

In 1989, the first version of GNU GPL was published.The GNU project's kernel, later called GNU/Hurd was continually delayed, but most other components like GCC,GDB, and GNU Emacs were completed by 1991.

At that time, a finnish student Linus Torwarlds developed the Linux kernel in 1991 and released the kernel as freely modifiable source code and the project was licensed as GPL in 1992.

Tux: The Linux Logo

The combination of the GNU operating system and the Linux kernel made the first complete free software operating system later to be called GNU/Linux. The Debian GNU/Linux begun by Ian Murdock in 1993, is noteworthy for being explicitly committed to free software.
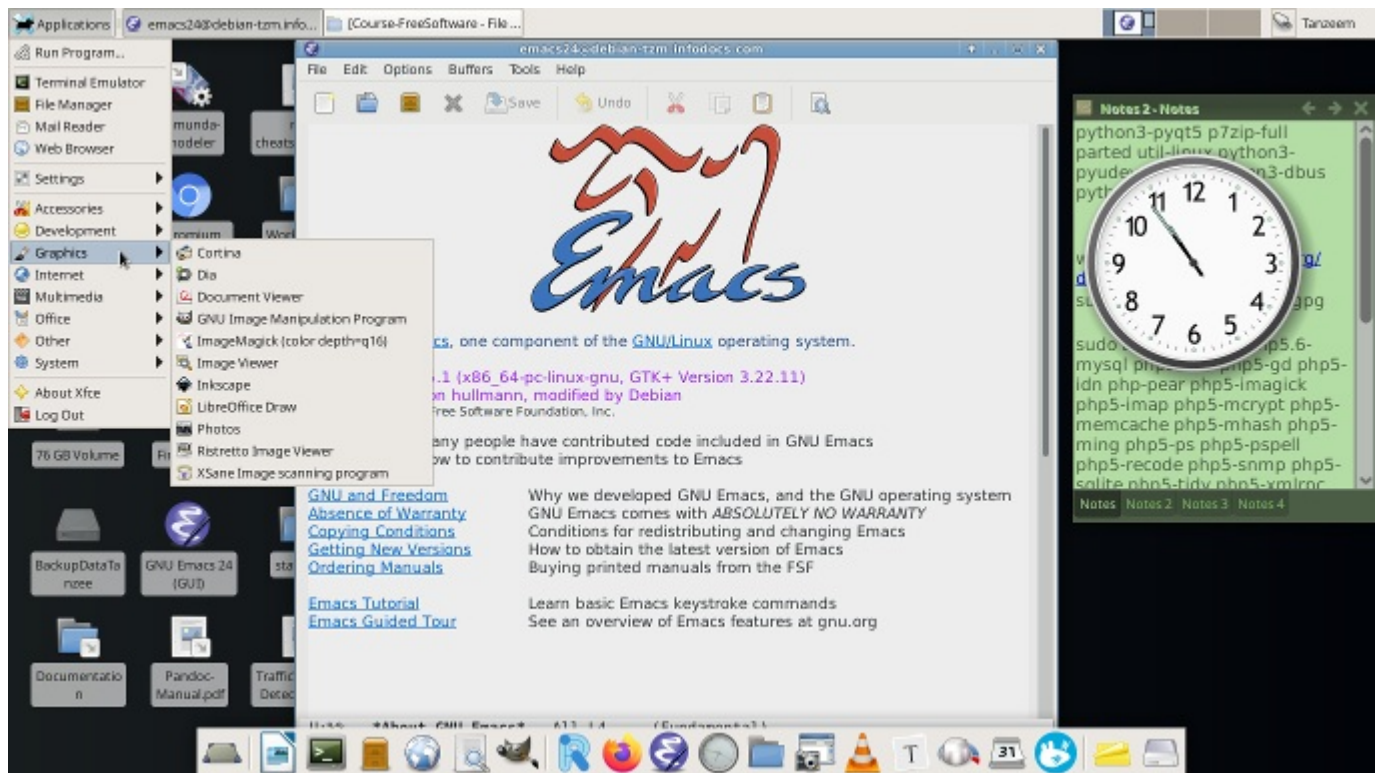
A desktop running Debian GNU/Linux OS with xfce Desktop environment

There are some animated videos from FSF that will give you a better understanding of the importance of free software. These videos are hosted on Peertube, a free and decentralized replacement to YouTube. See the following link

https://framatube.org/videos/watch/43af45ec-d99a-4e36-a084-e8e1ce28dee8

<iframe src="https://static.fsf.org/nosvn/videos/fsf-rewind/" id="fsf-rewind-video" scrolling="no" style="overflow: hidden; margin: 0; border: 0 none; display: block; width: 100%; height: 67vw; max-height: 550px;"></iframe>

Another video of this kind from the FSF named "The University of Costumed Heroes". Video Link hosted on Peertube : https://framatube.org/videos/watch/32ded243-ea5f-4f69-8dd0-5628c9231379

Free Software are used for commercial purposes. Many widely used free software commercial software uses a technical support business model.

You should be aware of what exactly the term **proprietary software** means. There are also other terms like **freeware** and **shareware** that you should be aware of.

Proprietary software or **non-free** software also known as **closed source** software doesnt give user freedoms to modify or reuse and distribute; the source code is often not provided. This kind of software can allow eavesdropping of data usage like even collecting and sending user information without their knowledge. Some proprietary software are privded as **freeware** and **shareware**. Proprietary software promotes vendor-lockin which leads to monopoly. The Microsoft EULA is an example of proprietary license. eg: Microsoft Windows operating system, Microsoft Office, Mac OS, Oracle DB, Oracle Java, Adobe Photoshop, Skype, Google Search/ Google Map.

Freeware is any software that can be distributed at no cost. This should not be confused with Free Software. Freeware are mostly proprietary, though some are distributed as free software also.Some freeware products are released alongside paid versions ie, there would be two versions - one paid version and the other a zero cost version but with limited features. This approach is known as **freemium** ("free" + "premium") since the free version is intended to promote the premium version.

Shareware is a type of proprietary software which is initially provided free of charge to users who are allowed and encouraged to make and share copies of the program. Shareware is often offered as a download from website or on a CD/DVD included with technology magazines.

People in FOSS

- **Richard Stallman** Founder of the free software movement, the GNU project and FSF. His major contributions include the GNU Emacs and the GNU General Public License) GPL.

- **Linus Torwarlds** The man behind the Linux kernel
  which is widely used in all GNU/Linux distribution.

- **Eric Raymond** (Open Source Initiative)

  He wrote the famous book: Cathedral and Bazaar. Eric
  founded the OSI(Open Source Initiative)

- **Ian Murdock** The man behind the Debian GNU/Linux Operating System which is known as the universal operating system and is widely used GNU/Linux Server OS, is well known for its stability and strict adherence to free software guidelines.

Photo of Ian Murdock- Attribute: "Ilya Schurov, Computerra Weekly"

- **Mark Shuttleworth** The Ubuntu GNU/Linux operating system was founded by him and is developed and maintained by his company named Canonical Inc.
- **Aaron Swartz** The famous internet programmer and the master mind behind various projects like the web feed format RSS, the markdown publishing format. He was invloved in development for Creative Commons. His other contributions include the OpenLibrary, web2py, DeadDrop(SecureDrop), Demand Progress and

  Tor2web.

- **Lawrence Lessig:** He founded the Creative Commons,

the organization which creates and promotes various licenses for sharing and reusing contents from the web which includes text,images and video.

- **Larry Wall** (PERL) The PERL programming language is widely known for its support for regular expressions and support for string manipulation. It was the programmer's choice for many years and many major programs like KOHA, Duckduckgo widely uses PERL.
- **Guido van Rossum** (Python) The Python programming language has been around for years and has emerged out to be hottest technology of these days with many software libraries for Data Analyitcs, AI and Machine Learning being widely developed in Python.
- **Rasmus Lerdoff** (PHP) The PHP Programming Language was founded by Rasmus Lerdoff. PHP is known for its simplicity and has been widely accepted by programmers The LAMPP platform widely promoted this and many popular frameworks for development and content management are created with PHP.

Difference between the

terms free software and opensource

Stallman and the FSF chose the term free software to highlight the idea of freedom in the use and development of software. The term opensource came when Mr Eric S Raymond, a free software developer and advocate wrote *The Cathedral and Bazaar*, which compares two development models: Cathedral which refers to sharing the source code between an exclusive group of developers and the Bazaar model in which code is developed publicly over the internet. Some free software enthusiasts(Raymond,Linus Torvarlds and others) tried a new way to promote free software by rebranding the term by chosing the term "open source" with the hope that it would better reflect the business value of a collaborative, community development model. The **Open Source Initiative(OSI)** was founded by **Raymond** and **Bruce Perens.**

Logo of Opensource Initiative

The Open Source Definition was developed by the OSI which includes the following ten principles:

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

See https://opensource.org/osd-annotated for detailed information about opensource definition.

The difference between "free software" and "opensource" is negligible for most people since it comes from different approaches in philosophy. **Hence both these terms are widely used interchangeably.** Though there are differences, the common motive is to make the society understandable in the risks of proprietary software.

FSF mentions in detail **why opensource misses the point of free software** in its article https://www.gnu.org/philosophy/open-source-misses-the-point.html in which it mentions that *"All existing released free software source code would qualify as open source. Nearly all open source software is free software, but there are exceptions. First, some open source licenses are too restrictive, so they do not qualify as free licenses. For example, "Open Watcom" is nonfree because its license does not allow making a modified version and using it privately. Fortunately, few programs use such licenses. Second, when a program's source code carries a weak license, one without copyleft, its executables can carry additional nonfree conditions. Microsoft does this with Visual Studio Code, for example."*.

Later on some movements were made to get the free software and opensource community together. Among these were some people suggesting to use the terms Free and Open Source Software (FOSS) and another term Free/Libre and Open Source Software(FLOSS).

Major Organizations involved in the promotion of free and opensource software

- **Free Software Foundation::**
  The FSF is a non profit organization founded by Richard Stallman in 1985 October 4, and is the first and major organization that promotes free software.The organization is based in Boston,

Massachusetts, US.

John Sullivan is the current executive directive. The major projects of FSF includes the GNU Project, the GNU Licenses, maintaining the Free Software Directory, the h-node hardware catalog. The operating systems approved by FSF includes Trisquel, Parabola,PureOS, Debian main. The FSF maintains a respect your freedom(RYF) hardware endorsement program. Libreboot and Coreboot are endorsed as part of the FreeBIOS project as a replacement to the legacy BIOS and the restricted UEFI based booting systems. Organization Website: https://www.fsf.org/

- **Software Freedom Conservancy::**
  Software Freedom Conservancy is a not-for-profit charity that helps promote, improve, develop, and defend Free, Libre, and Open Source Software (FLOSS)

projects.

Conservancy provides a non-profit home and infrastructure for FLOSS projects. This allows FLOSS

developers to focus on what they do best — writing and improving FLOSS for the general public — while Conservancy takes care of the projects' needs that do not relate directly to software development and documentation.

- **Creative Commons::**
  This organization has created a number of licenses and public domain tools that are suitable for creative works which include text, images , music and video. The organization was founded by Lawrence Lessig and pals in 2001. Aron Swartz was one of the initial contributors of Creative Commons.

Creative Commons Logo

Creative Commons is a non-profit organization that helps overcome legal challenges in the sharing of knowledge and creative contents. CCSearch tool developed by Creative Commons to easily discover CC licensed contents over web. Creative Commons organized the CC Summit, an annual event that brings together an international group of educators, artists, technologists, legal experts, and activists to promote the power of open licensing and global access. See the link https://creativecommons.org/about/ to know more about the services offered by Creative Commons.

- **Electronic Frontier Foundation::**
  The EFF is an international digital rights group to promote internet civil liberties. It was founded in 1990 in a response to basic threat to speech and privacy.

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Major projects of EFF include HTTPS Everywhere, Privacy Badger, Certbot, PanoptClick, Surveillance Self Defence guide. See https://www.eff.org for details

- **Digital Freedom Foundation::**
  Digital Freedom Foundation (DFF) is a non-profit organisation that acts as the official organiser of Software, Hardware, and other Freedom Days, and is the legal body that handles donations, sponsorship contracts, and accounting. They have made necessary provisions for tax-deduction for donations in free software domain. Website: https://digitalfreedomfoundation.org/

  The Digital Freedom Foundation also organizes Freedom Day events.

  - Education Freedom Day (third Saturday in January)
  - Document Freedom Day (last Wednesday of March)
  - Hardware Freedom Day (third Saturday in April)
  - Culture Freedom Day (third Saturday in May)
  - Software Freedom Day (third Saturday in September)

  https://dff.org.in/ is the organization's website in India founded by Krishnakanth Mane. His major work include the GNUKhata Accounting application.
- **Open Source Initiative::**
  The OSI was founded in 1998 by Bruce Perence and Eric Raymond. Major contributions includes the Open Source Definition and has worked in creating awareness in opensource. The group adopted the Open Source Definition for open-source software, based on the Debian Free Software Guidelines. See website https://opensource.org for details.
- **Software Freedom Law Centre::**
  The Software Freedom Law Center (SFLC) is a tax excempt organization that provides legal representation and related services to not-for-profit developers of free software/open source software in a professional way without payment. It was launched in February 2005 with **Eben Moglen** as

chairman. SFLC works include patent defence and has voluntarily filed petitions for protection of free software licenses. SFLC also provides public education, consulting and training to attorneys interested in FOSS Legal issues. Th lawsuit filed by the FSF against Cisco in 2008 was done by the support of SFLC. The services offered can be studied in detail from their website https://softwarefreedom.org/services/ .

- **The Linux Foundation::**
  Founded in 2000, the Linux Foundation provides unparalleled support for open source communities through financial and intellectual resources, infrastructure, services, events, and training.

The Linux Foundation (LF) is a non-profit technology consortium created as a merger between Open Source Development Labs and the Free Standards Group to standardize Linux, support its growth, and promote its commercial adoption. It also hosts and promotes the collaborative development of open source software projects. Major projects hosted and supported includes the Linux kernel, Hyperledger, Kubernetes, Nodejs, Tizen, Xen project. The website https://www.linuxfoundation.org gives more details.

- **ICFOSS::**
  ICFOSS (International Centre for Free and Open Source) is a Govt of Kerala organization in India founded in 2009.ICFOSS today carries out a number of FOSS-related activities in a model that brings together Academia, Industry, Government and the FOSS Community. Activities of ICFOSS presently includes R & D; Support to FOSS software development; FOSS Pilot Programs; technology assistance to Government programs and institutions; Local Language computing; Student FOSS activities; Internet Governance; Studies on FOSS; Exploring FOSS Certification; and

Capacity Building of students to enter the FOSS Community.

- **Software in the Public Interest::**
  Software in the Public Interest (SPI) is a non-profit corporation registered in the state of New York founded to act as a fiscal sponsor for organizations that develop open source software and hardware.

SPI Logo

The mission is to help substantial and significant open source projects by handling their non-technical administrative tasks so that they aren't required to operate their own legal entity. Founded in 1997, SPI was initially involved in the funding of Debian projects. Other major projects associated with SPI include Arch Linux,LibreOffice, Postgresql and Swatantra Malayalam Computing. Details of the SPI associated projects can be studied from https://www.spi-inc.org/projects/ .

- **Apache Software Foundation::**
  The Apache Software Foundation is an American non-profit organization founded in 1999. The ASF is the organization behind the popular Apache web server and the famous Apache license.

The Logo of Apache Software Foundation - Licensed by Apache 2.0

The Apache Software Foundation provides support for
300+ Apache Projects and their Communities, furthering
its mission of providing Open Source software for the
public good. The ASF develops, and incubates hundreds
of freely-available, enterprise-grade projects that
serve as the backbone for some of the most visible and
widely used applications in computing today. The ASF
creates and maintains applications in Artificial
Intelligence and Deep Learning, Big Data, Build
Management, Cloud Computing, Content Management,
DevOps, IoT and Edge Computing, Mobile, Servers, and
Web Frameworks. The ASF organizes yearly conferences
also. See https://apache.org/ for more details about
the organization.

- **OpenStreetmap Foundation::**
  The OpenStreetMap Foundation is a non-profit
  foundation founded in 2006 whose aim is to support
  and enable the development of freely-reusable
  geospatial data.

Logo of the OpenStreetmap Project

The OpenStreetMap Project based at OpenStreetMap.org,
is the worldwide mapping effort that includes over two
million volunteers around the globe. OpenStreetMap
(OSM) is a collaborative project to create a free
editable map of the world. The geodata underlying the
map is considered the primary output of the project.
The creation and growth of OSM has been motivated by
restrictions on use or availability of map data across
much of the world, and the advent of inexpensive

portable satellite navigation devices and was
developed as a free software replacement to
GoogleMaps. See https://www.openstreetmap.org/ and
https://wiki.osmfoundation.org/wiki/Main_Page

- **Open Knowledge Foundation (OKF)::**
  The OKF is a global non-profit network that promotes
  and shares information at no charge, including both
  content and data. It was founded by Rufus Pollock in
  May 2004.

The Open Knowledge Foundation Logo: License: CC BY 4.0

It organises the OKCon and supports the International
Open Data Day to promote the idea of open knowledge
and open data. The projects of OKN include CKAN- a
tool that provides store for metadata. This enables
governments to quickly and cheaply provide a catalogue
of their data.Other major activities include DataHub,
OpenBibliography, OpenEconomics and OpenGLAM. See the
link http://okfn.org/ to study more about OKF and its
activities.

Popular Free Software Licenses

- **Protective License (CopyLeft)::**
  The free-software share-alike licenses written by
  Richard Stallman in the mid-1980s pioneered a
  concept known as "copyleft".

The Symbol of CopyLeft

Ensuing copyleft provisions stated that when modified versions of free software are distributed, they must be distributed under the same terms as the original software. This results in the new software being free software(free as in freedom not zero price) as well. Since copyleft ensures that later generations of the software grant the freedom to modify the code, this is "free software". Study more about this in the link: https://www.gnu.org/licenses/copyleft.en.html

eg: GNU GPL, GNU AGPL, GNU LGPL, GNU FDL.

The strength of the copyleft license governing a work is determined by the extent its provisions can be imposed on all kinds of derived works.

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Public License(**MPL**).

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Logo of the latest version GNU GPL v3

Logo of the Affero General Public License v3

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  However, there are some licenses under this category which allows proprietarization and these licenses are to be carefully looked into.
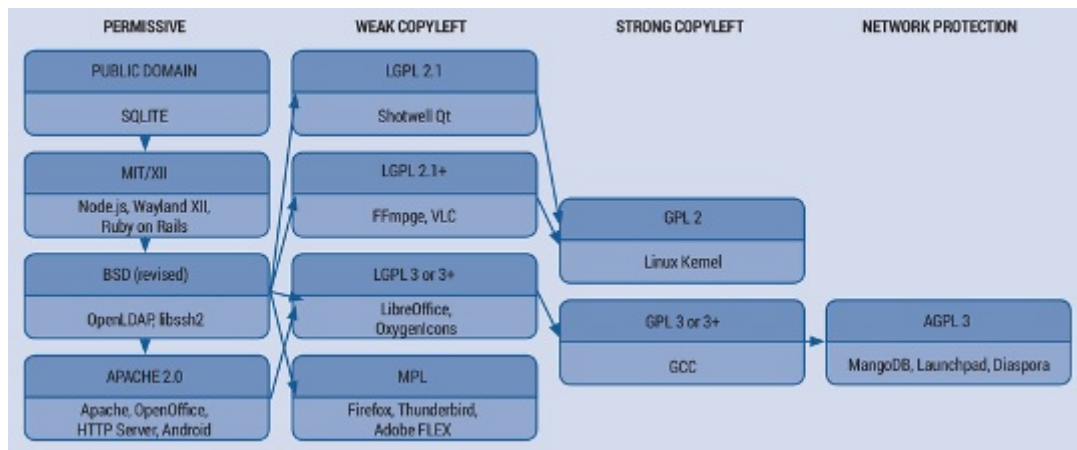
License Compatibility Matrix : License compatibility between common FOSS software licenses according to David A. Wheeler (2007): the vector arrows denote a one directional compatibility, therefore better compatibility on the left side ("permissive licenses") than on the right side ("copyleft licenses").

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The GNU GPL can also be used for general data which is not software, as long as one can determine what the definition of "source code" refers to in the particular

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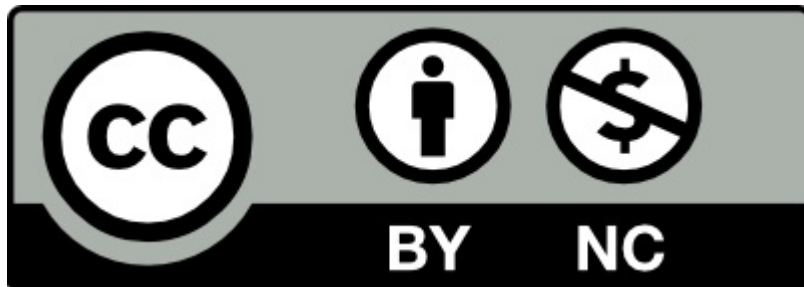

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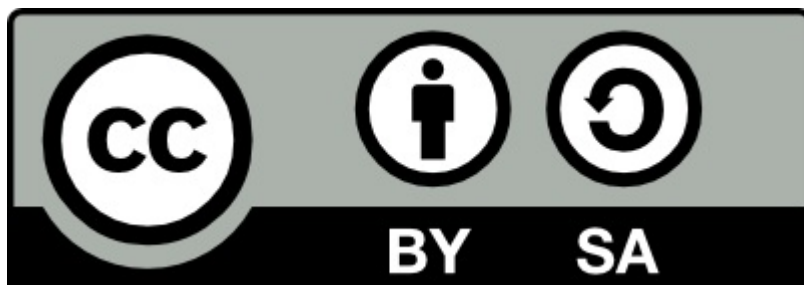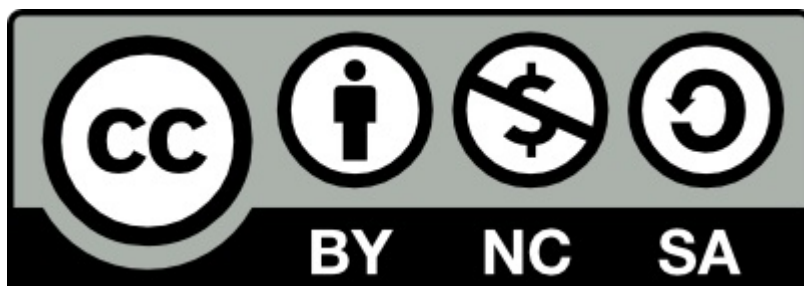

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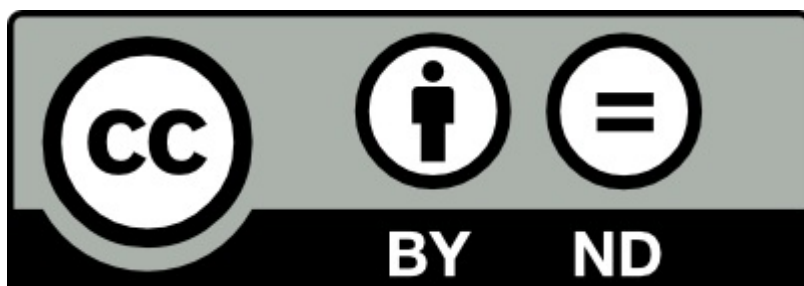
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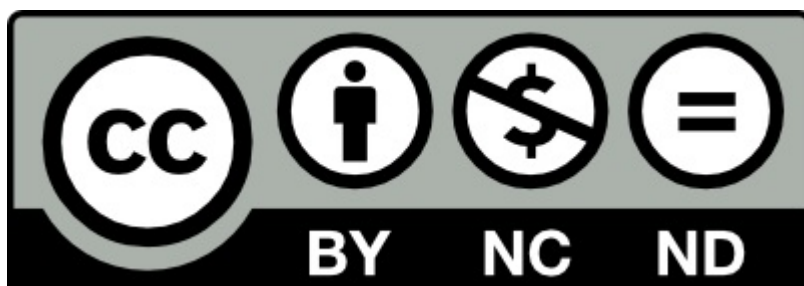
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See the link https://www.gnu.org/licenses/gpl-faq.html for a detailed study.

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