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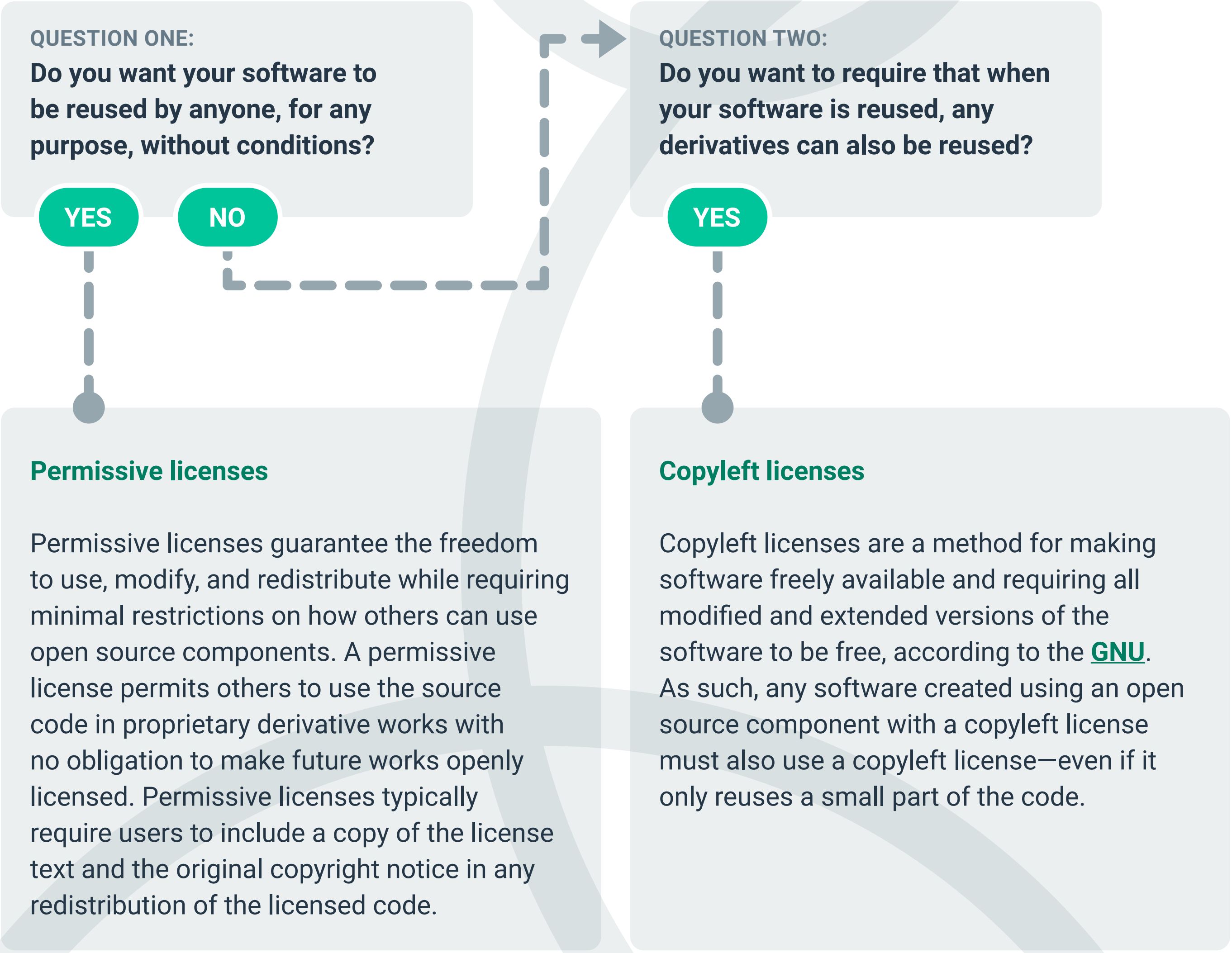
How to choose an open source license

Open source licenses

Open source licenses allow others to use, modify, and share your software freely. Software licensing allows you to communicate what other researchers can and cannot do with your software. Still, choosing the best license for your project can often be challenging. **Here, we offer some preliminary guidance on how to select an open source license**.

The first step in choosing the right license for your project is deciding which type of open source license best suits your research goals. You need to determine the level of freedom you want to give the users when it comes to using and modifying your software.



QUESTION ONE:

Do you want your software to be reused by anyone, for any purpose, without conditions?

QUESTION TWO:

Do you want to require that when your software is reused, any derivatives can also be reused?

Permissive licenses

Permissive licenses guarantee the freedom to use, modify, and redistribute while requiring minimal restrictions on how others can use open source components. A permissive license permits others to use the source code in proprietary derivative works with no obligation to make future works openly licensed. Permissive licenses typically require users to include a copy of the license text and the original copyright notice in any redistribution of the licensed code.

Copyleft licenses

Copyleft licenses are a method for making software freely available and requiring all modified and extended versions of the software to be free, according to the GNU. As such, any software created using an open source component with a copyleft license must also use a copyleft license—even if it only reuses a small part of the code.

Most popular open source licenses

Now you know which type of open source license is the most suitable for your research project. Let's take a look at the most popular open source licenses.

Many open source licenses are available, making it difficult to know where to start when selecting a license for your software. The Open Source Initiative (OSI) is a global non-profit organization that acts as a standards body to maintain a shared definition of "open source" and accredit licenses. **At F1000**, we strongly advise our authors to use OSI-approved licenses to distribute their work.

Here are some of the most popular OSI-approved licenses:

Apache License 2.0 (Apache 2.0): This permissive license allows end-users to reuse code for almost any purpose, including as part of proprietary software. The Apache software license has more specific rules than other permissive licenses on how users can utilize the software for their own projects.

Berkeley Software Distribution License (BSD): This permissive license allows for the modification, distribution without any restriction, and reuse of the software for any purpose, including commercial use. The main requirement of the BSD license is that any distribution of the software must include the source code, a copy of the license, and a disclaimer of liability.

MIT License (MIT): The MIT is a permissive software license with few reuse restrictions. This type of license permits users to use, copy, modify, distribute, sublicense, or even sell copies of the software.

GNU General Public License (GPL): The GPL is a copyleft license which grants users the right to modify, extend, or redistribute the source code. Yet, all derivative work must be licensed under the same or equivalent terms.

GNU Library or "Lesser" General Public License (LGPL): The LGPL is a more permissive version of the copyleft GPL and is typically used for software libraries instead of applications. This license only requires users to release the LGPL-licensed component of the derivative program—not the whole program—under the same terms (free to use, share, study, modify).

Comparing the most popular open source licenses

To make your final and best choice, you can also refer to the table below which summarizes the key capabilities and limitations of each license.

License name	Apache License 2.0	Berkley Software Distribution License	MIT License	GNU General Public License	GNU Library / ‘Lesser’ General Public License
Type	PERMISSIVE	PERMISSIVE	PERMISSIVE	COPYLEFT	COPYLEFT
Owner retains copyright	✓ TRUE	✓ TRUE	✓ TRUE	✓ TRUE	✓ TRUE
Can be used for commercial derivatives	✓ TRUE	✓ TRUE	✓ TRUE	✓ TRUE	✓ TRUE
Provides an explicit patent license	✓ TRUE	✗ FALSE	✗ FALSE	✗ FALSE	✗ FALSE
Can be used in closed source projects	✓ TRUE	✓ TRUE	✓ TRUE	✗ FALSE	✗ FALSE*

Source

***Partially:** Restrictions apply on how the code can be distributed and modified

Dual licensing

Others can use your open source software in their projects as long as it's openly licensed. Yet, **if someone wants to use it in a closed-source, distributed application, you will need to provide for them a way to purchase your software under a separate, commercial license.**

To achieve this, you can license your software under both an open source license (typically GNU GPL) and a proprietary (closed source) license. The restrictions on the reuse of your software will then depend on which license the software is distributed under. Dual licensing allows you to potentially profit from your software whilst maintaining the benefits of open source licensing.

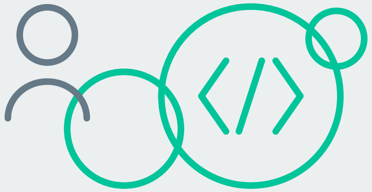
What if...?

I am contributing to or extending an existing project?

In this case, it's always best to **use the project's license or the one preferred by the community you're working with.** If you come across software that does not have a license, ask its maintainers to add one.

I want a simple and permissive license?

If so, **the MIT license** is a great choice because it lets others use your project for almost any purpose as long as they include the original copyright and license notice in any copies of the software.



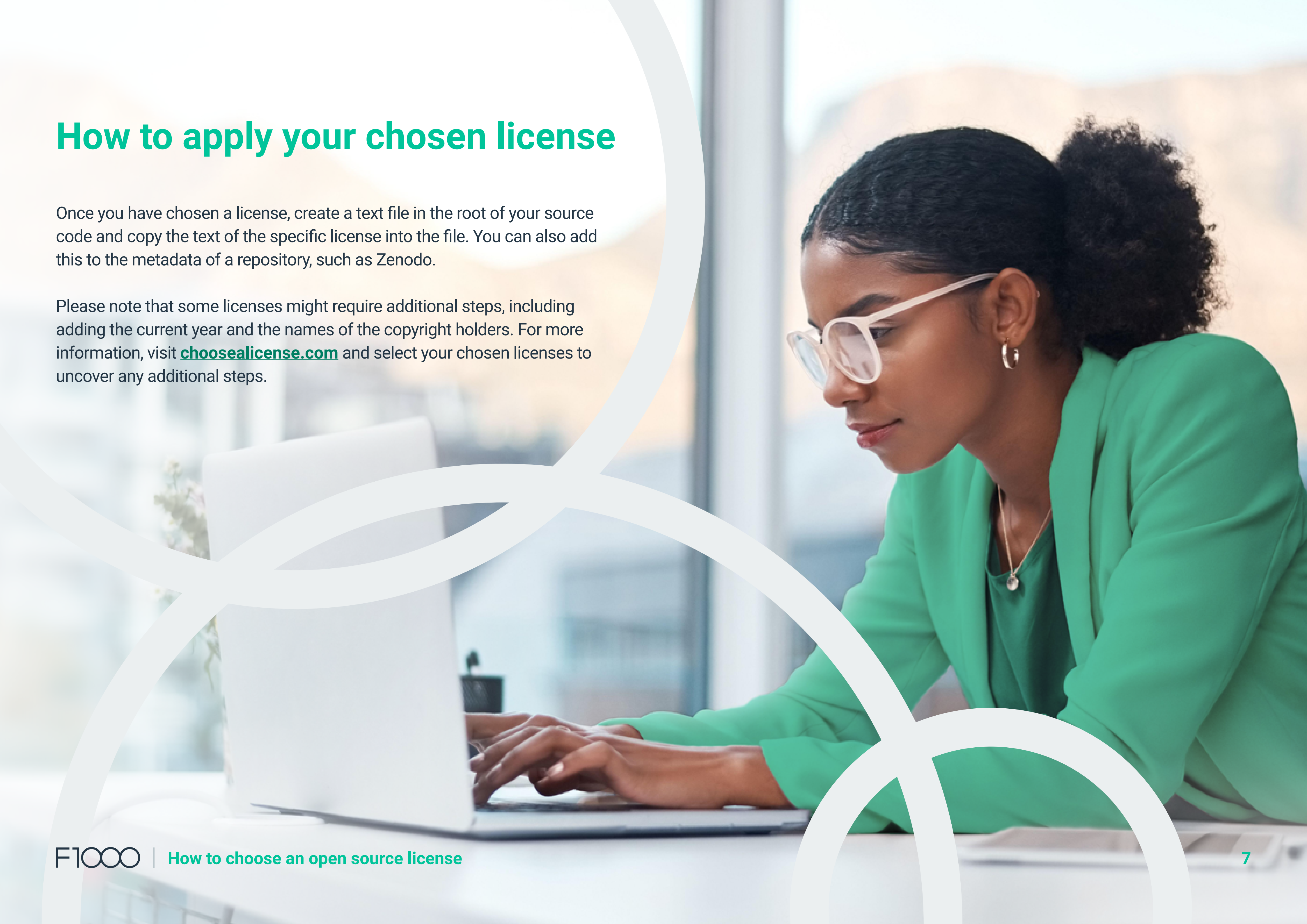
I want to share my code improvements with the wider open source community?

The latest version of the GNU GPL might be the best option as it lets others do almost anything they want with your project apart from distributing closed source versions of the software or code.

How to apply your chosen license

Once you have chosen a license, create a text file in the root of your source code and copy the text of the specific license into the file. You can also add this to the metadata of a repository, such as Zenodo.

Please note that some licenses might require additional steps, including adding the current year and the names of the copyright holders. For more information, visit **choosealicense.com** and select your chosen licenses to uncover any additional steps.



Glossary

Derivative work:

Under the Copyright Act, a derivative work is defined as "work based upon one or more preexisting works, such as a translation, musical arrangement, dramatization, fictionalization, motion picture version, sound recording, art reproduction, abridgment, condensation, or any other form in which a work may be recast, transformed, or adapted."

Proprietary derivative works:

In this context, this term refers to the possibility for users to build a commercial product/software on openly licensed software.

Proprietary software:

As opposed to 'public-domain software', this type of software is not freely distributed. Proprietary software is copyrighted and owned by its creator, whether that's an organization, company, or individual, which means potential users need to pay for a license to obtain it.

Proprietary software license:

Also known as closed-source or commercial software license, this type of license has a copyright and limitations in terms of use and distribution. Users can purchase a proprietary software license for a fee but don't have access to the source code. Plus, end-users cannot distribute the software nor copy it in any way.

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At F1000, we know that open software is just as important as open data when it comes to ensuring reproducibility. That's why we are one of the first publishers to require authors to make their software openly available alongside their research and data.

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