

FAIR_bioinfo : Open Science and FAIR principles in a bioinformatics project

How to make a bioinformatics project more reproducible

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June 2021



General information

Practical information:

- Dates: June 28th - 30th
- Location: Institut des Systèmes Complexes, 113 rue Nationale, 75013-Paris
- Courses: 9:00 to 17:30
- Meal: 12:30-14:00
- Pauses: 10:30-11:00 + 15:30-16:00
- 2 days of courses + 1 day of course building

Round table:





- Teachers
- Learners

Ressources:








- 
- GitLab
- L^AT_EX

Training schedule

Day 1:

- Introduction to reproducibility
- History management (3 Practical Sessions,  git,  GitHub)
- Control your development environment (1 PS,  CONDA)
- Encapsulation (2 PS,  docker)

Day 2:

- Workflow (2 PS,  SNAKEMAKE)
- Traceability with notebooks (2 PS,  JUPYTER, 
- IFB resources (2 PS,  SLURM, 
- Sharing and disseminating ( GitHub,  zenodo)
- Conclusion

Day 3:

- Empowerment and improvement of resources

Table of contents

- 1 Introduction to reproducibility
- 2 History management
- 3 Control your development environment
- 4 Workflow
- 5 Tracability with Notebook
- 6 IFB resources
- 7 Sharing and dissemination**
 - Showcase your work
 - Release
 - Obtain a DOI
- 8 Conclusion
- 9 3rd Day

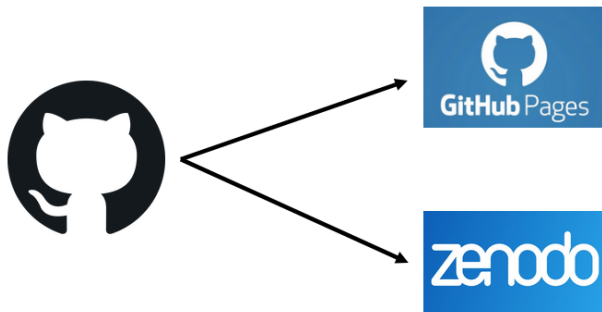


Sharing and disseminating your project

Sharing and disseminating

Goals of this session:

- Showcase your work
- Add a licence
- Create a release
- Obtain a DOI for the project



Showcase your work

Showcase your work



Showcase your work



Why ?

- Your project is simpler to share and find

Advantages

- Free hosting of static websites
- Able to convert Markdown into a website

Documentation : <https://pages.github.com/>

Showcase your work

In practice

From the main page of your repository, go to :

- "Settings" tab
- → "Options" (left hand side menu)
- → navigate to the "GitHub Pages" paragraph.

GitHub Pages

GitHub Pages is designed to host your personal, organization, or project pages from a GitHub repository.

Source

GitHub Pages is currently disabled. Select a source below to enable GitHub Pages for this repository. [Learn more.](#)

None ▾

Theme Chooser

Select a theme to publish your site with a Jekyll theme using the master branch. [Learn more.](#)

Choose a theme



Showcase your work

In practice

From the main page of your repository, go to "Settings" → "Options" → "GitHub Pages".

1 Choose the source

GitHub Pages

GitHub Pages is designed to host your personal, organization, or project pages from a GitHub repository.

Source

GitHub Pages is currently disabled. Select a source below to enable GitHub Pages for this repository. [Learn more.](#)

None ▾

Save

Select branch

×

Select branch

main

✓ None

Danger Zone

Showcase your work

In practice

From the main page of your repository, go to "Settings" → "Options" → "GitHub Pages".

- 1 Choose the source

GitHub Pages

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Source

GitHub Pages is currently disabled. Select a source below to enable GitHub Pages for this repository. [Learn more.](#)

Branch: main ▾

Theme Chooser

Select a theme to publish

Choose a theme

/ (root) ▾

Save

Select folder

✓ / (root)

/docs

Showcase your work

In practice

From the main page of your repository, go to "Settings" → "Options" → "GitHub Pages".

1 Choose the source

GitHub Pages

GitHub Pages is designed to host your personal, organization, or project pages from a GitHub repository.

Source

GitHub Pages is currently disabled. Select a [source](#) below to enable GitHub Pages for this repository. [Learn more.](#)

Branch: main ▾

/ (root) ▾

Save

Theme Chooser

Select a theme to publish your site with a Jekyll theme using the `main` branch. [Learn more.](#)

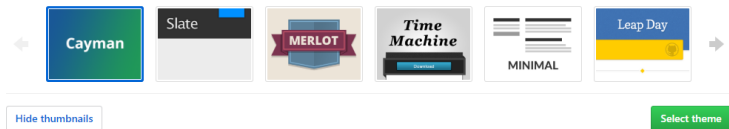
Choose a theme

Showcase your work

In practice

From the main page of your repository, go to "Settings" → "Options"
→ "GitHub Pages".

- 1 Choose the source
- 2 Choose the theme



Showcase your work

Convert Markdown into HTML !

```
# Welcome !

**Bienvenue à FAIR_bioinfo**

Vous trouverez ici des communications réali

**You will find here some communications mad

**Informations pratiques**
- Quand ? : le dernier vendredi après midi
- Durée ? : 1h30 (questions incluses)
- Lieu ? : Salle de conférence A.Kalogeropo

**Objectifs**

L'objectif est de proposer et d'utiliser un
FAIR correspond à l'acronyme anglais "Finda
Le projet support est une étude "d'expressi

**Pré-requis**
```



Welcome !

Bienvenue à FAIR_bioinfo

Vous trouverez ici des communications réalisables lors des sessions FAIR_bioinfo. Les communications sont en français. Tout le contenu présenté existe déjà en anglais sur internet. Nous proposons donc ici des ressources pour les francophones.

You will find here some communications made during the IBF Bioinformatics Club. Communications will be mainly in French. All the content presented also exists in English on the internet. Therefore, we propose here resources for Francophones.

Informations pratiques

- Quand ? : le dernier vendredi après midi de chaque mois (sauf juillet à défaut), rdv 12h30
- Durée ? : 1h30 (questions incluses)
- Lieu ? : Salle de conférence A.Kalogeropoulos, b. 400, campus Orsay

Objectifs

L'objectif est de proposer et d'utiliser un panel d'outils permettant la réalisation d'un projet complet de bio-informatique en partant de rien et aboutissant à la création d'un conteneur (technologie Docker). Le partage, la validation et l'analyse dynamique des données seront inclus dans le panel. FAIR correspond à l'acronyme anglais "Findable, Accessible, Interoperable, Reusable", initialement défini pour les données mais que nous étendons ici pour leurs protocoles d'analyse. Le projet support est une étude "d'expression différentielle de gènes" à partir de données RNAseq d'Osau.

Pré-requis

Questions ... Savoir taper sur un clavier ?

Contact

- Thomas DENECKER (thomas.denecker@gmail.com)
- Claire Toffano-Nioche (claire.toffano-nioche@u-psud.fr)

Communications orales

https://thomasdenecker.github.io/FAIR_Bioinfo



Showcase your work

Also works directly from HTML

- 1 Create a folder named "docs"
 - ▶ main file must be named index.html
- 2 "Settings" → "Options" → "GitHub Pages"

GitHub Pages

GitHub Pages is designed to host your personal, organization, or project pages from a GitHub repository.

✓ Your site is published at <https://thomasdenecker.github.io/bPeaks-application/>

Source
Your GitHub Pages site is currently being built from the `docs` folder in the `master` branch. [Learn more.](#)

Theme Chooser
Select a theme to publish your site with a Jekyll theme. [Learn more.](#)

Custom domain
Custom domains allow you to serve your site from a domain other than `thomasdenecker.github.io`. [Learn more.](#)

Enforce HTTPS
— Required for your site because you are using the default domain (`thomasdenecker.github.io`)

HTTPS provides a layer of encryption that prevents others from snooping on or tampering with traffic to your site. When HTTPS is enforced, your site will only be served over HTTPS. [Learn more.](#)

<https://thomasdenecker.github.io/bPeaks-application/>



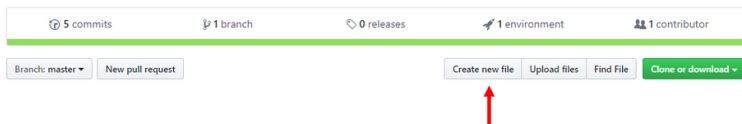
Showcase your work

Remember to choose a licence !

This will determine whether anyone can use, modify, and distribute your code / tool / software...

<https://help.github.com/en/articles/licensing-a-repository>

- 1 Create a file named "LICENCE"
- 2 GitHub will suggest templates



Showcase your work


Remember to choose a licence !

This will determine whether anyone can use, modify, and distribute your code / tool / software...

<https://help.github.com/en/articles/licensing-a-repository>

- 1 Create a file named "LICENCE"
- 2 GitHub will suggest templates

Fair Projet / LICENCE Cancel

 Choose a license template

The CeCILL licence (v.2.1) is recommended by the CEA, CNRS and INRIA ("CEA CNRS INRIA Logiciel Libre"). Copy it directly.

<http://cecill.info/licences.fr.html>

Showcase your work

GitHub takes care of displaying the information on your repository.

thomasdencker / Fair_Projet

Code Issues Pull requests Projects Wiki Security Insights Settings

Add a license to your project

License	Permissions	Limitations	Conditions
Apache License 2.0			
GNU General Public License v3.0			
MIT License			
BSD 2-Clause "Simplified" License			
BSD 3-Clause "New" or "Revised" License	<input checked="" type="checkbox"/> Commercial use <input checked="" type="checkbox"/> Modification <input checked="" type="checkbox"/> Distribution <input checked="" type="checkbox"/> Private use	<input checked="" type="checkbox"/> Liability <input checked="" type="checkbox"/> Warranty	<input checked="" type="checkbox"/> License and copyright notice
Edgex Public License 2.0			
GNU Affero General Public License v3.0			
GNU General Public License v2.0			
GNU Lesser General Public License v2.1			
GNU Lesser General Public License v3.0			
Mozilla Public License 2.0			
The Unlicense			

BSD 3-Clause License

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To adopt BSD 3-Clause "New" or "Revised" License, enter your details. You'll have a chance to review before committing a LICENSE file to a new branch or the root of your project.


Year

Full name

Review and submit

Showcase your work

Validate and merge with the main branch

<p> thomasdenecker/Fair_Projet is licensed under the BSD 3-Clause "New" or "Revised" License</p> <p>A permissive license similar to the BSD 2-Clause License, but with a 3rd clause that prohibits others from using the name of the project or its contributors to promote derived products without written consent.</p> <p>This is not legal advice. Learn more about repository licenses.</p>	<p>Permissions</p> <ul style="list-style-type: none">✓ Commercial use✓ Modification✓ Distribution✓ Private use	<p>Limitations</p> <ul style="list-style-type: none">✗ Liability✗ Warranty	<p>Conditions</p> <ul style="list-style-type: none">ⓘ License and copyright notice
--	--	--	---

Showcase your work

Kind reminder: consequence of not choosing a licence.

No License

When you make a creative work (which includes code), the work is under exclusive copyright by default. Unless you include a license that specifies otherwise, nobody else can copy, distribute, or modify your work without being at risk of take-downs, shake-downs, or litigation. Once the work has other contributors (each a copyright holder), "nobody" starts including you.

Even in the absence of a license file, you may grant some rights in cases where you publish your source code to a site that requires accepting terms of service. For example, if you publish your source code in a public repository on GitHub, you have accepted the [Terms of Service](#), by which you allow others to view and fork your repository. Others may not need your permission if [limitations and exceptions to copyright](#) apply to their particular situation. Neither site terms nor jurisdiction-specific copyright limitations are sufficient for the kinds of collaboration that people usually seek on a public code host, such as experimentation, modification, and sharing as fostered by an open source license.

You don't have to do anything to not offer a license. You may however wish to add a copyright notice and statement that you are not offering any license in a prominent place (e.g., your project's README) so that [users](#) don't assume you made an oversight. If you're going to accept others' contributions to your non-licensed project, you may wish to explore with your lawyer adding a contributor agreement to your project so that you maintain copyright permission from contributors, even though you're not granting the same.

Disallowing use of your code might not be what you intend by "no license." An [open-source license](#) allows reuse of your code while retaining copyright. If your goal is to completely opt-out of copyright restrictions, try a [public domain dedication](#).

For users

If you find software that doesn't have a license, that generally means you have no permission from the creators of the software to use, modify, or share the software. Although a code host such as GitHub may allow you to view and fork the code, this does not imply that you are permitted to use, modify, or share the software for any purpose.

Your options:

- **Ask the maintainers nicely to add a license.** Unless the software includes strong indications to the contrary, lack of a license is probably an oversight. If the software is hosted on a site like GitHub, open an issue requesting a license and include a link to this site. If you're bold and it's fairly obvious what license is most appropriate, open a pull request to add a license – see "suggest this license" in the sidebar of the page for each license on this site (e.g., [MIT](#)).
- **Don't use the software.** Find or create an alternative that is under an open source license.
- **Negotiate a private license.** Bring your lawyer.

Release

Release

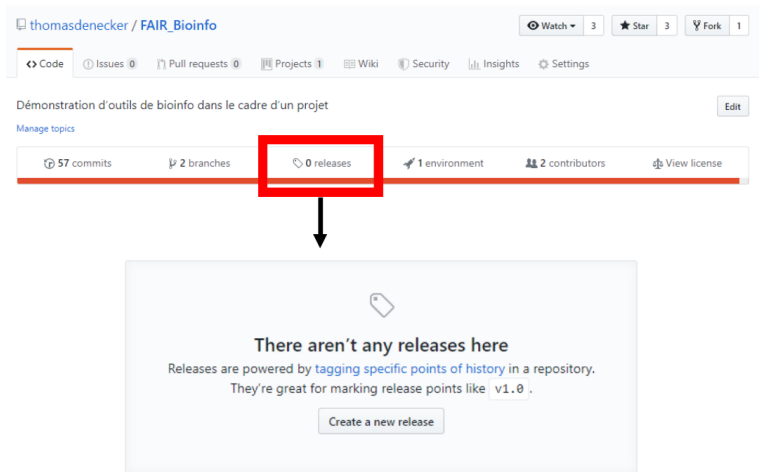
Goal : provide users with a version of your code that has been fixed in time and labelled.

All the steps are detailed here:

- <https://help.github.com/en/articles/creating-releases>

Release

Make a release



thomasdenecker / FAIR_Bioinfo

Watch 3 Star 3 Fork 1

Code Issues 0 Pull requests 0 Projects 1 Wiki Security Insights Settings

Démonstration d'outils de bioinfo dans le cadre d'un projet Edit

Manage topics

57 commits 2 branches **0 releases** 1 environment 2 contributors View license

There aren't any releases here

Releases are powered by [tagging specific points of history](#) in a repository. They're great for marking release points like `v1.0`.

[Create a new release](#)

Release

Make a release

thomasdenecker / FAIR_Bioinfo

Watch 3 Star 3 Fork 1

Code Issues 0 Pull requests 0 Projects 1 Wiki Security Insights Settings

Releases Tags

Tag version @ Target: master

Choose an existing tag, or create a new tag on publish

Release title

Write Preview

Describe this release

Attach files by dragging & dropping, selecting or pasting them.

Attach binaries by dropping them here or selecting them.

This is a pre-release
We'll point out that this release is identified as non-production ready.

Publish release Save draft

Tagging suggestions

It's common practice to prefix your version names with the letter v. Some good tag names might be v1.0 or v2.3.4.

If the tag isn't meant for production use, add a pre-release version after the version name. Some good pre-release versions might be v0.2-a1pha or v5.9-beta.3.

Semantic versioning

If you're new to releasing software, we highly recommend reading about [semantic versioning](#).



Release

Semantic of a release number

1.0.0
MAJOR.MINOR.PATCH

- MAJOR : changes not backwards-compatible
- MINOR : new/modified functionalities, backwards-compatible
- PATCH : bug fixes, backwards-compatible

More details : <https://semver.org/>


Release

First release for FAIR_Bioinfo

Releases Tags Edit release Delete

Latest release

1.0.0
1e307ed

 **thomasdenecker** released this just now

1.0.0

Update [Readme](#)

Assets 2

[Source code \(zip\)](#)

[Source code \(tar.gz\)](#)

Obtain a DOI

Obtain a DOI



Obtain a DOI

Digital Object Identifier

Reference system to cite an object (A GitHub project in our case)



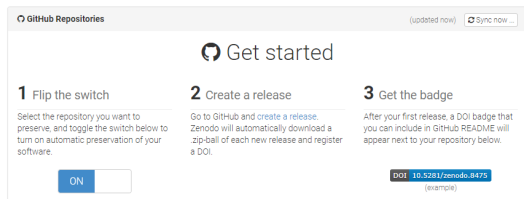
<https://guides.github.com/activities/citable-code/>

Obtain a DOI

1/ Sign in to Zenodo

- With your GitHub account
- With your ORCID account (add a "Linked account" to GitHub afterwards)

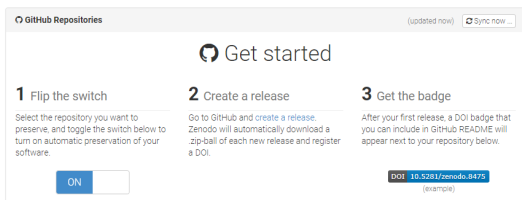
2/ Go to the Settings page → GitHub tab



The screenshot shows the 'GitHub Repositories' settings page in Zenodo. At the top, it says '(updated now)' and has a 'Sync now...' button. The main heading is 'Get started' with a circular arrow icon. Below this, there are three numbered steps:


- 1 Flip the switch**
Select the repository you want to preserve, and toggle the switch below to turn on automatic preservation of your software.
There is a blue 'ON' button and a white switch.
- 2 Create a release**
Go to GitHub and [create a release](#). Zenodo will automatically download a .zip-ball of each new release and register a DOI.
- 3 Get the badge**
After your first release, a DOI badge that you can include in GitHub README will appear next to your repository below.
An example badge is shown: `DOI 10.5281/zenodo.8475` (example)

Obtain a DOI



GitHub Repositories (updated now) [Sync now ...](#)

Get started

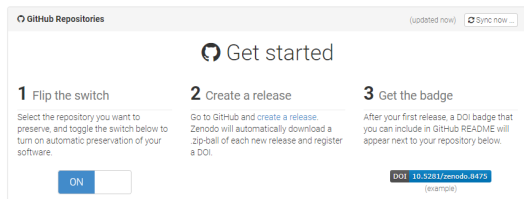
- 1 Flip the switch**
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After your first release, a DOI badge that you can include in GitHub README will appear next to your repository below.


3/ In the list below, find the project you want to link to Zenodo. Flip the switch.

 [thomasdenecker/FAIR_Bioinfo](#)

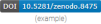


Obtain a DOI



GitHub Repositories (updated now) Sync now ...

Get started

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After your first release, a DOI badge that you can include in GitHub README will appear next to your repository below.


4/ On GitHub, in Settings → Webhooks, a new line has been created: Zenodo will be notified of any new release created in this project.

Webhooks

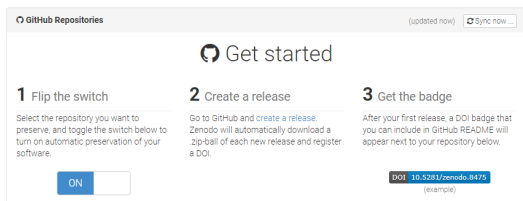
Add webhook

Webhooks allow external services to be notified when certain events happen. When the specified events happen, we'll send a POST request to each of the URLs you provide. Learn more in our [Webhooks Guide](#).

✓ <https://zenodo.org/api/hooks/receivers/github/events/> (release)

Edit Delete

Obtain a DOI



GitHub Repositories (updated now)

Get started

- 1 Flip the switch**
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DOI 10.5281/zenodo.8475
(example)

5/ Back to Zenodo. After a release, a badge will be available below the project's name, in the category Enabled repositories.



 [thomasdenecker/FAIR_Bioinfo](#)

DOI 10.5281/zenodo.3238205

Obtain a DOI

DOI Badge

This badge points to the latest released version of your repository. If you want a DOI badge for a specific release, please follow the DOI link for one of the specific releases and grab badge from the archived record.

Markdown

```
[![DOI](https://zenodo.org/badge/164655551.svg)](https://zenodo.org/badge/late
```

reStructuredText

```
.. image:: https://zenodo.org/badge/164655551.svg  
   :target: https://zenodo.org/badge/latestdoi/164655551
```

HTML

```
<a href="https://zenodo.org/badge/latestdoi/164655551"><img src="https://zenod
```

Image URL

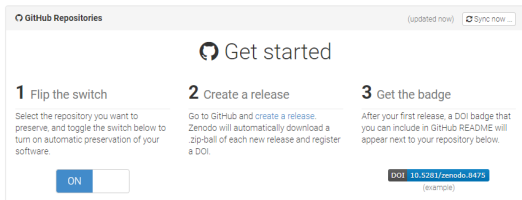
```
https://zenodo.org/badge/164655551.svg
```

Target URL

```
https://zenodo.org/badge/latestdoi/164655551
```



Obtain a DOI



GitHub Repositories (updated now) Sync now ...

Get started

- 1 Flip the switch**

Select the repository you want to preserve, and toggle the switch below to turn on automatic preservation of your software.

ON
- 2 Create a release**

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- 3 Get the badge**

After your first release, a DOI badge that you can include in GitHub README will appear next to your repository below.

DOI 10.5281/zenodo.8475
(example)

6/ Add the code for the badge to the README.

Welcome !

DOI 10.5281/zenodo.3238205

Bienvenue à FAIR_bioinfo

Vous trouverez ici des communications réalisées lors des sessions FAIR_bioinfo. Les communications sont en français. Tout le contenu présenté existe déjà en anglais sur internet. Nous proposons donc ici des ressources pour les francophones.

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GitHub Package Registry

The screenshot shows the GitHub Package Registry interface for the package 'Codertocat / hello-world-npm'. The page includes navigation tabs for Code, Issues, Pull requests, Projects, Wiki, Insights, and Settings. The 'Packages' tab is active, showing the package name 'hello-world-npm 1.0.1' with a 'Latest version' badge. Below this, there are instructions on how to install the package from the command line, via package.json, and how to configure npm for use with the registry. The package details section on the right lists the package name, repository ID, version (1.0.1), published date (May 10, 2019), assets (hello-world-npm-1.0.1-npm.tgz, 816 bytes), download activity (1 download today, 1 this week, 1 this month, 1 this year), and recent versions (1.0.1, 1.0.0, 41 minutes ago). The installation section provides a command to install the package and a snippet of package.json showing the dependency configuration. The usage section shows a simple Node.js script that uses the package.

Codertocat / hello-world-npm Private

Watch Star Fork

Code Issues Pull requests Projects Wiki Insights Settings

Releases Tags Packages

hello-world-npm 1.0.1 Latest version

Install from the command line:
npm install @codertocat/hello-world-npm@1.0.1

Install via package.json:
{"codertocat/hello-world-npm": "1.0.1"}

Configure npm for use with GitHub Package Registry

Edit description

hello-world-npm

This is a simple npm package that demonstrates the [GitHub Package Registry](#).

Installation

Before installing, make sure to authenticate with GitHub Package Registry or using a .npmrc file. See ["Configuring npm for use with GitHub Package Registry"](#).

```
$ npm install @codertocat/hello-world-npm
```

Or add this package to your package.json file:

```
"dependencies": {  
  "@codertocat/hello-world-npm": "1.0.0"  
}
```

Usage

```
const myPackage = require('@codertocat/hello-world-npm');  
myPackage.helloworld();
```

Package details

- Codertocat
- Codertocat/hello-world-npm
- v961376
- 1.0.1
- May 10, 2019

Assets

- hello-world-npm-1.0.1-npm.tgz
816 bytes

Download Activity

- 1 downloads today
- 1 downloads this week
- 1 downloads this month
- 1 downloads this year

Recent versions

- 1.0.1
2 minutes ago
- 1.0.0
41 minutes ago

Packages directly available on GitHub.

`https://help.github.com/en/articles/about-github-package-registry`
`https://github.com/features/package-registry`

