XIMERA

Interactive Mathematics Education Resources for All

User Manual

Fowler • Obbels • Nowell • Snapp

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Source: https://github.com/ximeraProject/ximeraManuals

developed in XIMERA

To lovers of mathematics everywhere.

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Email: ximera@math.osu.edu Website: https://github.com/ximeraProject/

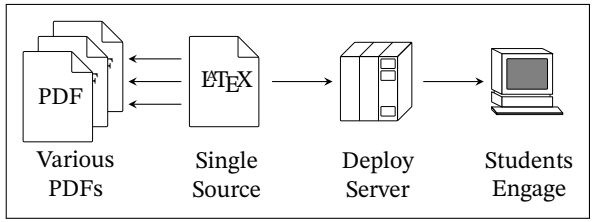
1 Introduction and setup

1.1 About Ximera

What is Ximera? What is it supposed to do? Who is it for?

Ximera, pronounced "chimera," (**X**imera: **I**nteractive, **M**athematics, **E**ducation, **R**esources, for **A**ll) is an open-source platform that provides tools for authoring and publishing (PDF and Online), open-source, interactive educational content, such as textbooks, assessments, and online courses.

Authors write and store their content on their own machines and GitHub repositories. Authors own their content and decide how to license their content. From a single source written in LaTeX, Ximera generates various output: PDF worksheets, PDF textbooks, and PDF solution manuals, and so on. Of most interest, Ximera can also create online interactive activities:



The source code used to produce PDFs can also create interactive online activities when deployed to a Ximera server. Students access this content via a URL or an assignment in their LMS.

Students interact with the *content* produced within Ximera, hence their experience is highly dependent on the *quality* of this content. Research shows that students find Ximera materials to be more readable than traditional course materials and perform equivalently to those using proprietary textbooks and online homework systems. While students typically encounter Ximera through their courses, many discover it via web-search and use the platform as independent learners. In 2023, Ximera has over one million unique visitors. Since Ximera materials are free, they are accessible to anyone, regardless of enrollment in official courses.

Get involved by contributing as an instructor, author, or developer. To get started with Ximera, visit our *First Steps in Ximera* GitHub repository:

https://go.osu.edu/xfs

This document assumes you have completed the instructions there, and have successively deployed Ximera content online.

Funding for the Ximera Project is provided by a U.S. Department of Education Open Textbooks Pilot Program grant in the amount of $2,125,000, from 2024–2026, with no external funding. In the past, the Ximera Project has also received support from NSF Grant DUE-1245433, the Shuttleworth Foundation, the Ohio State University Department of Mathematics, and the Affordable Learning Exchange at Ohio State.

As a token of our appreciation, **consider applying for a Ximera Flash-Grant Stipend:**

https://go.osu.edu/ximera-flash-grant

Thank you for your interest in Ximera. We encourage you to contact the team with any questions you may have.

The authors listed on the cover are the current Ximera lead developers. In reality, this document has many authors as it is part of an evolution of Ximera documentation. Rodney Austin, Oscar Levin, Matt Thomas, and Hans Parshall authored parts of the either the document class or original documentation.

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1.2 First steps in Ximera

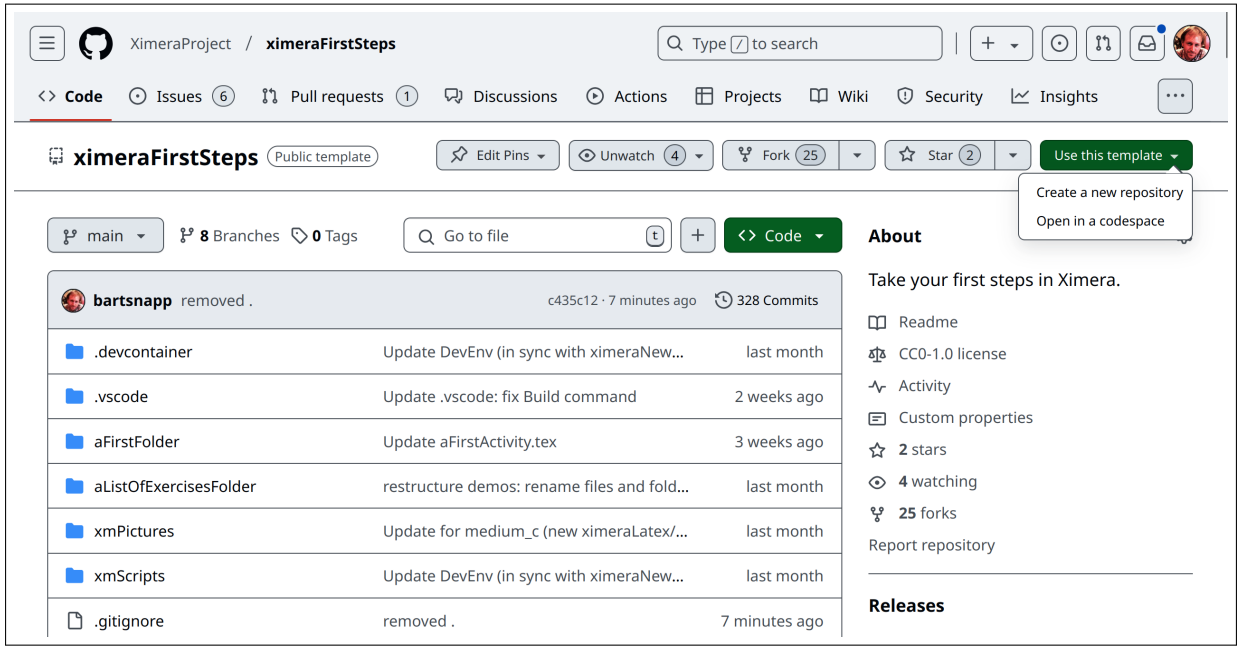
Try out Ximera!

To use Ximera, you must have a *GitHub*[1] account. *GitHub* is a web platform where developers can store, share, and manage their code. It uses `git`, popular software for version control, to help teams work together simultaneously without overwriting each other's changes. *GitHub* has issue tracking, pull requests for proposing changes, and other project management tools. It's like a shared folder for coding, designed to help teams work smarter and track progress. Go to `https://github.com` and either sign-up or log-in. Note, you must know your **username** and **password**, so store them in a safe place; like in a safe, or under your bed.

After you have a *GitHub* account, log-in and go to:

`https://github.com/ximeraProject/ximeraFirstSteps`

You will see something like this:



[1] See *GitHub* at `https://github.com`

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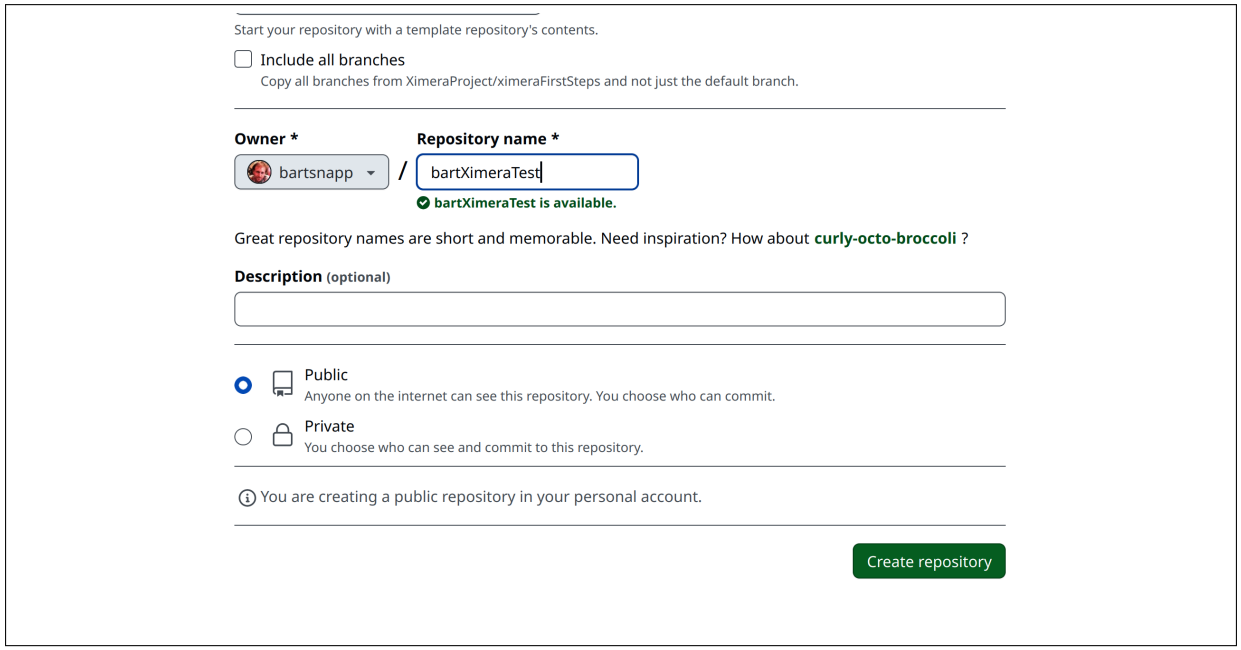
Click on the green “Use this template” button and select “Create a new repository.” Give it a fun repository name, and push the button “Create repository.”



At this point you have your own personal copy of our repository `XimeraFirstSteps`. In fact, after you create it, *GitHub* will take you to it. This copy can always be found at

`https://github.com/YOUR-GIT-USER-NAME/YOUR-REPO-NAME`

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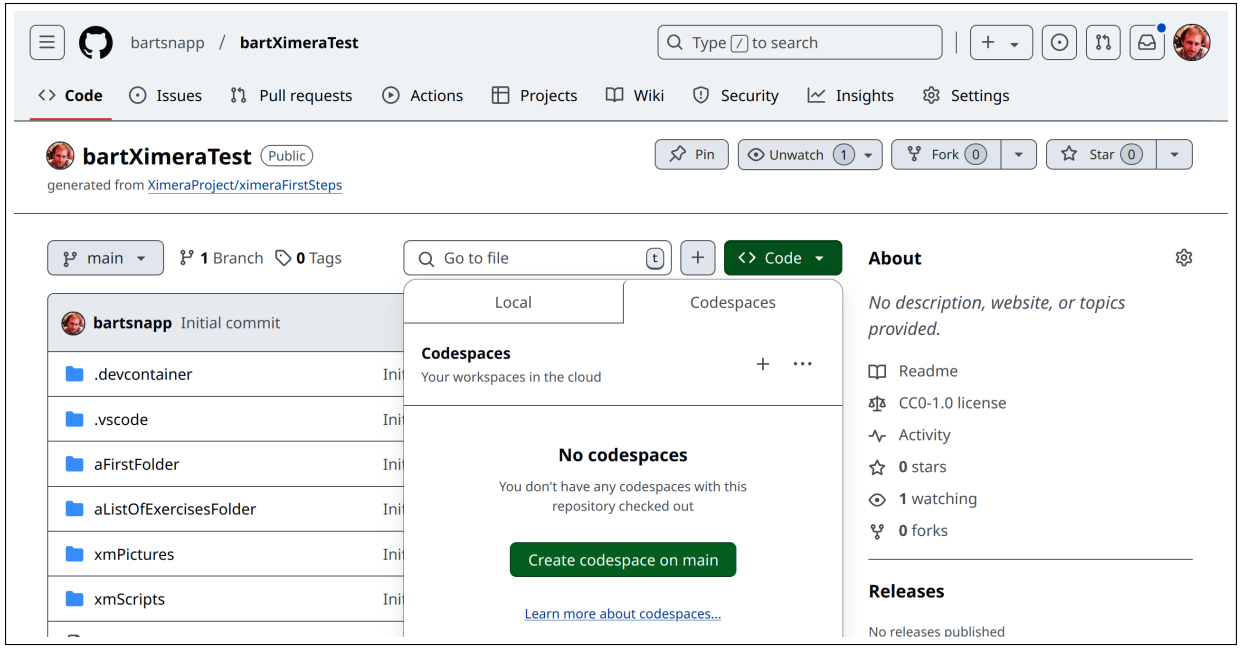

Once there, click the green “code” button, select the “Codespaces” tab, and click “Create codespace on main.” A *GitHub* codespace is like a remote computer set up specifically for coding. It’s a cloud-based environment where you can write, test, and run your code, just like on your own computer, but everything happens on remote servers. It comes preconfigured with all the tools, libraries, and settings you need for your project. You connect to it through your browser or favorite editor, and because it’s tied to your GitHub projects, you can instantly start working without worrying about setting up software on your local machine. It’s like having a ready-to-use, fully equipped coding computer that you can access from anywhere. **It will take around 5 minutes for your codespace to be created.**

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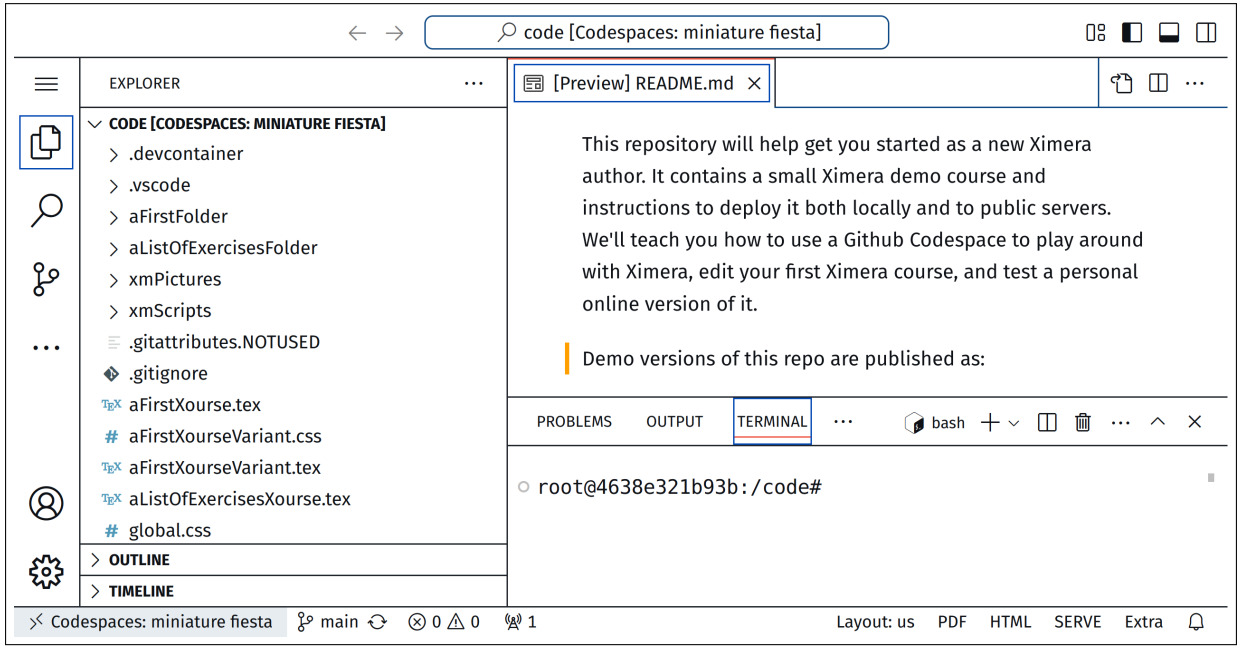
Once the codespace is created, you will see something like this:



At the bottom right-hand corner of the screen you will see a button that says “SERVE.” Press this button to compile Ximera content to HTML and JavaScript.

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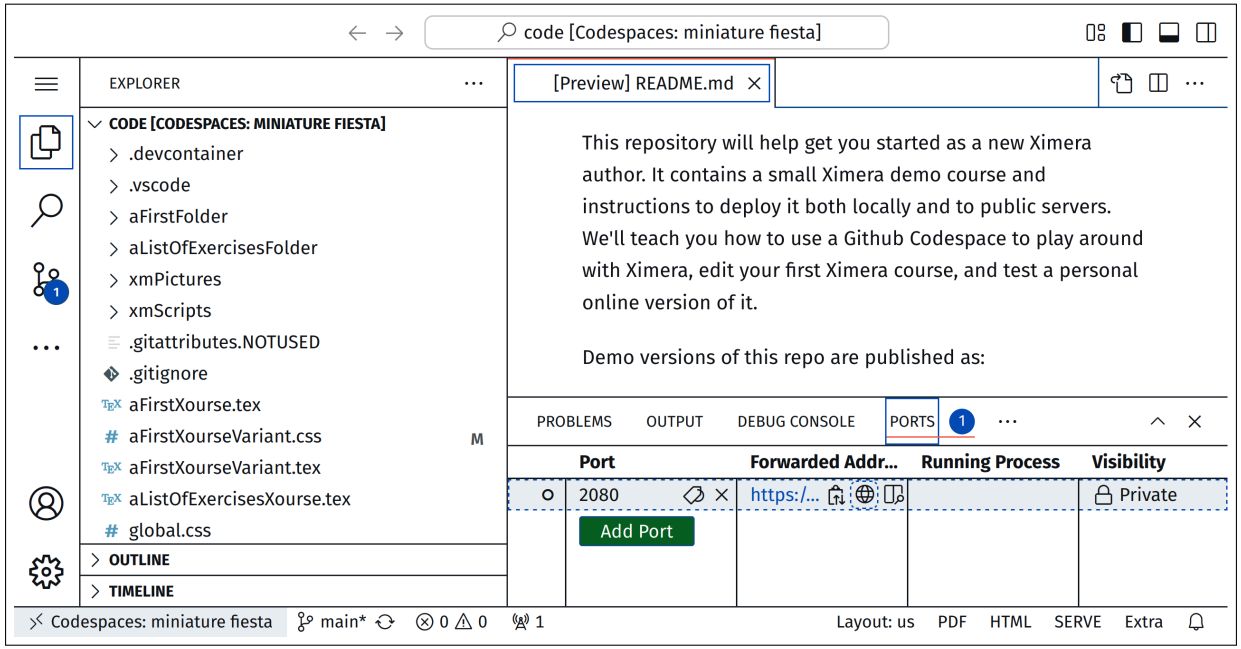
Once the compilation is finished, note the line that says: “PROBLEMS,” “OUTPUT,” “DEBUG CONSOLE,” “TERMINAL,” “PORTS.” You want to click on “PORTS.” The “PORTS” tab may be hidden within · · ·.



After you click on “PORTS,” click on the globe, and a webpage will open. Your content will be under the link “Content.” You should be able to see the content in your browser. Demo versions of this repo are published as:

- a preview with the newest Ximera layout[2]
- a version on the current production server[3]

[2] See a preview with the newest Ximera layout at https://set.kuleuven.be/voorkennis/firststeps24/aFirstXourseVariant/aFirstFolder/aFirstActivityVariant
[3] See a version on the current production server at https://ximera.osu.edu/firststeps24/aFirstXourse/aFirstFolder/aFirstActivity