Workshop II

C++ Integrated Development Environments

SECTION I

What is an IDE?

The Workplace of Developers

- IDE stands for Integrated Development Environment
- It is a place where developers can write code, run it, use a debugger in addition to build automation tools and version control with git.
- There are many common IDEs for free such as Visual Studio, PyCharm, Eclipse, etc.
- Many of these IDEs are made for a specific language or set of languages.
- For this workshop will be learning one of the most prevalent and multifunctional IDEs, Visual Studio from Microsoft as well as a cloud-based IDE, Replit

Text Editors vs IDE

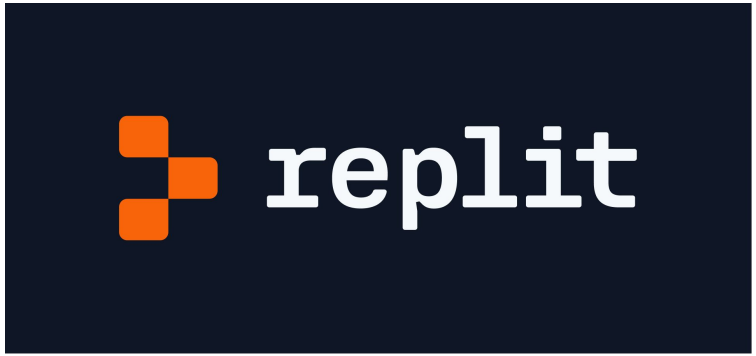
- Many new programmers tend to confuse text editors and IDEs
- Both are used for writing and developing code
- Text Editors only focus on writing code. There is no compiling or running of the code
- IDEs usually contain all a text editor does and more with a compiler, a debugger, and automation tools and version control integration.
- Usually a text editor needs plugins or a second software to fully develop code while an IDE can handle the entire process.

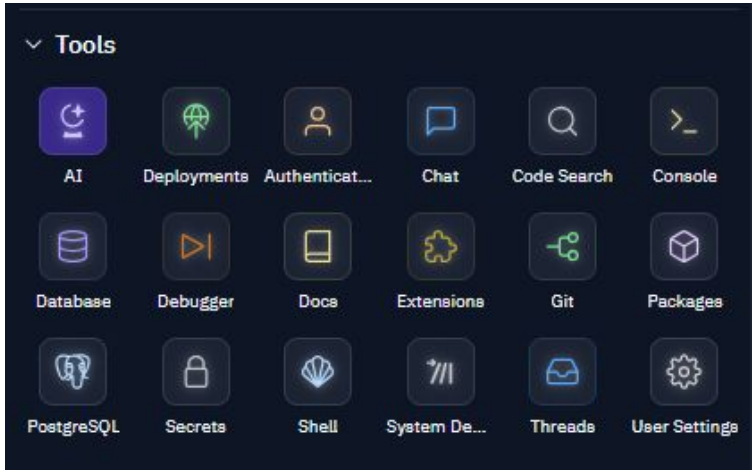
SECTION II

Replit

Replit Features

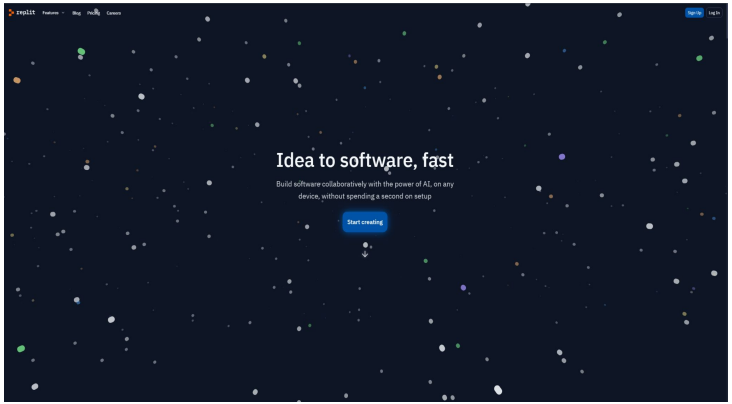
- Online IDE
  - Allows users to write, compile, and run code directly from their web browsers
- Multiple users can work on the same code in real-time.
- Includes various tools such as AI suggestions, a debugger, and other user settings
- Cloud-based storage
- Easy to set up!





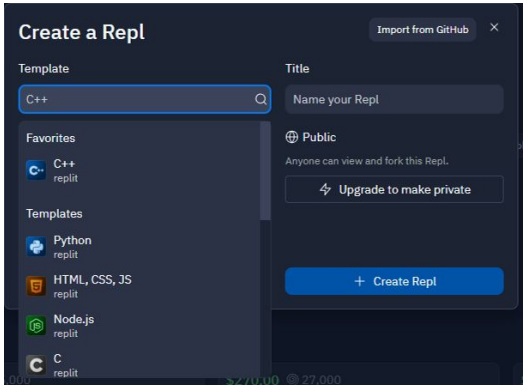
Setting up Replit

- Go to repl.it and sign up for an account



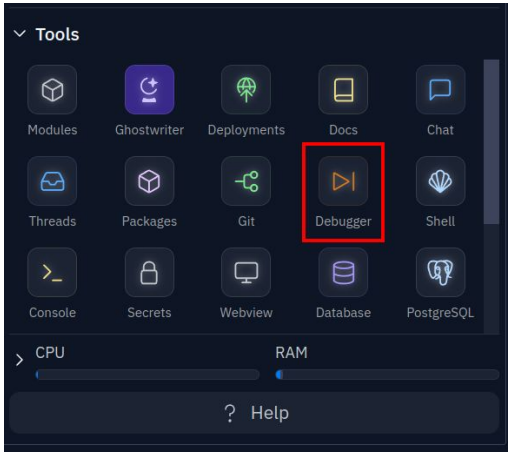
To create a project (repl):

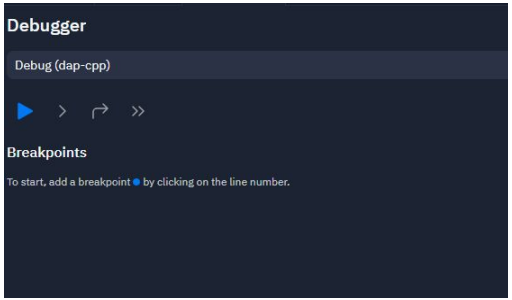
- Go to home page and click on “+ Create Repl”
- Choose the correct template for the language you want to explore (For us, C++)
- Projects are stored under “My Repls”



Debugging with Replit

- Find debugger under tools section
- Add breakpoints by right clicking on a line, then clicking on “Toggle breakpoint”
    - Program will pause during execution at breakpoints and will display the values of all variables
- Hit “Play”, check “variable values”, and then click “next line” to go through the code





SECTION II

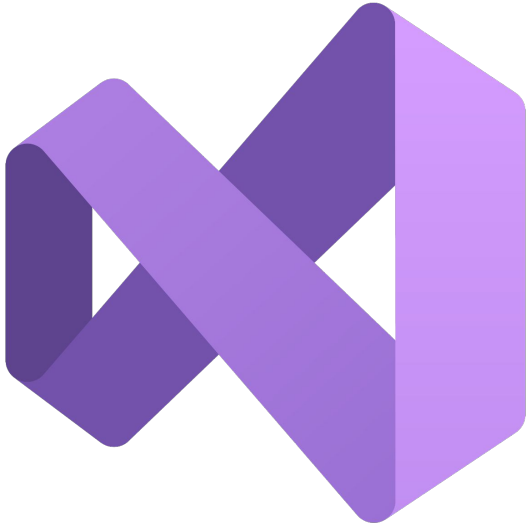
Visual Studio

What is Visual Studio?

- Visual Studio is a tool which can be used through the entire process of a developer.
- It is used for coding websites, mobile apps, video games, desktop applications, and aerospace software, and almost in every industry with code
- Users can write code, debug, test their code, compile, and finally finish their program
- It is used by over 400,000 companies as their primary IDE.

Why Use Visual Studio?

- Found in all over Industry!
- The IDE is a suite of tools beyond the text editor and build scripts... It is *feature-rich*: Testing tools, Git integration for version control, live code sharing, AI assistive tools, and so on.
- Visual Studio features aid for the navigation and debugging of large projects with complex data structures and several layers of APIs



SECTION III

Installing Visual Studio

Downloading Visual Studio

1. Click this link (not a virus): https://visualstudio.microsoft.com/downloads/?cid=learn-onpage-download-cta
2. Click the free community download and the download will start.
3. Once the .exe file is downloaded, run the installer and accept the terms of conditions and choose continue
4. Download the Workload titled “Desktop development with C++” and install

For MacOS Users

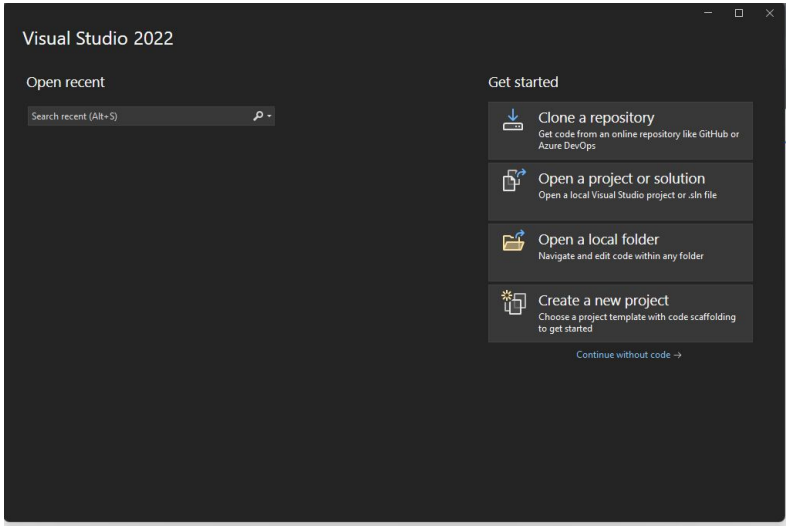
- MacOS Users can still use Visual Studio until August 2024.
- You will follow the same instructions, except you will download from this link: https://learn.microsoft.com/en-us/visualstudio/mac/what-happened-to-vs-for-mac?view=vsmac-2022#preview-vs-stable-builds-of-visual-studio-for-mac
- After this date, we recommend you use XCode as this is and IDE developed by Apple to be used on Macs. You can download this and set up from the Apple Store on MacOS.

SECTION IV

Using Visual Studio

Setting Up Visual Studio

1. Open Visual Studio Application
2. Create a new project, and choose “Empty Project”
3. Name and choose location of the project
4. Right click on “Source files”, and click “Add”, then “New Item” to add a Cpp file
5. Write code in the IDE!



Visual Studio Debugger

- Open the Debugger by clicking on the ‘Local Windows Debugger’ button - resides below the menu bar in the default window layout
  - You can run the program with the debugger on, showing variables and processes on the right panels
- Set breakpoints by left clicking to the left of a line or right click anywhere on the line and run the debugger for it to show variables of the selected line on the right panels in the default window layout.
  - For arrays or other data structures, hover over the variable to see all the elements found inside.
- After going through a breakpoint, you can either step into or step over proceeding lines.
  - Use the ‘Autos Window’ found on the right to see values of all variables in code as you are running it.

"In the symphony of code, debugging is the virtuoso performance that turns dissonance into harmony, transforming bugs into the silent applause of a flawless composition."

Wolfgang Amadeus Mozart (circa 1800)

Famous Misquotes

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