Level up with WebAssembly

The Book:

Chapter 1. Introduction

- What is WebAssembly?
- Who uses WebAssembly?
- Hello World example
- Under the hood (advanced)

Chapter 2. Setup + Hello World

- Setup Emscripten container
- Run the Hello World example

Chapter 3. Wait but why?

- Why Use WebAssembly?
- When to use WebAssembly
- When to avoid WebAssembly

Chapter 4. Hit the ground running

- Hello World
- Call main() with function arguments
- Calling custom C functions from JavaScript
- Calling JavaScript functions from C
- A note about C++
- Calling main() with cwrap() (advanced)

Chapter 5. The Module Object

- What is the Module object?
- Configure initial conditions
- Custom stdout/stderr handling
- Commonly-used Module parameters

Chapter 6. File Management

- Enable the virtual file system
- How to mount files
- Commonly-used FS functions
- Enable gzip support

Chapter 7. Compiling Existing Tools

- Using Makefiles
- Compiling the jq command line tool
- Building an interactive jq app
- Compiling a Markdown parser
- Compiling a JavaScript interpreter!

Chapter 8. Graphics

- Compile Pong to WebAssembly
- Compile Tetris to WebAssembly
- Compile Pacman to WebAssembly

Chapter 9. Persisting the File System

- Create a persistent file system
- Reload the file system after page refresh
- Pre-loading files at compile-time
- Mounting File objects instead of strings

Chapter 10. WebAssembly + WebWorkers

- WebWorkers Recap
- A simple example
- Mount a File object

Chapter 11. Conclusion

- Summary
- Resources

The Starter Kit:

Includes **The Book** plus:

Cheat Sheets

- Emscripten flags
- Module Object
- File System
- FileReader API
- WebWorkers
- Serverless WebAssembly

Guide: WebWorkers and FileReader APIs

WebWorkers

- What are WebWorkers?
- How to send and transfer data with postMessage()
- Typed Arrays as Views (advanced)

FileReader API

- Key Concepts
- A simple example

Guide: Serverless WebAssembly

- Introduction
- When to use Serverless WebAssembly
- Serverless Wasm with AWS, GCP, and Azure (Node.js)
- Serverless Wasm with Cloudflare (V8 isolates)
- Serverless Wasm with Fastly (Lucet runtime)
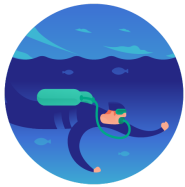- Overview of Cloud providers, features, and pricing

The Complete Edition:

Includes **The Starter Kit** plus:

Command-Line Screencasts

- Setup + Hello World
- Call main() with custom arguments
- Call C and C++ functions from JavaScript
- Module Object: custom initialization
- Module Object: custom stdout/stderr
- File system: Mount files to the virtual file system
- File system: Read files from the file system
- File system: Enable .gz support
- Compile an off-the-shelf library
- Leverage Makefiles with emmake
- How to compile jq to WebAssembly

Guide: Porting UNIX tools to the web

- Port awk
- Port diffutils + build a sample application
- Port coreutils (cut, sort, uniq, wc, etc.)

Capstone Project

- Goals: K-Means Clustering
- Sample solution