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## **Online Code Execution Engine**

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# Project Objective

- To conceptualize, design and build an online code execution engine that is faster than its competitors, reliable and secure.
- To allow users to share their code online in a safe and secure manner

# Why this project?

The scope of this project is to allow developers to have rapid prototyping abilities in the convenience of their browsers.

Our team is working on building a code execution engine directly in the browser which can be used by developers to rapidly test and implement various prototypes without going through the hassle of setting up a new development environment on their local machines.

Using Web Assembly developers will be able to see instant results of their code without ever having to build or run.

Since the engine is built in the browser itself, HTML and CSS layout prototyping can be leveraged via iFrames, thus speeding up the development process.

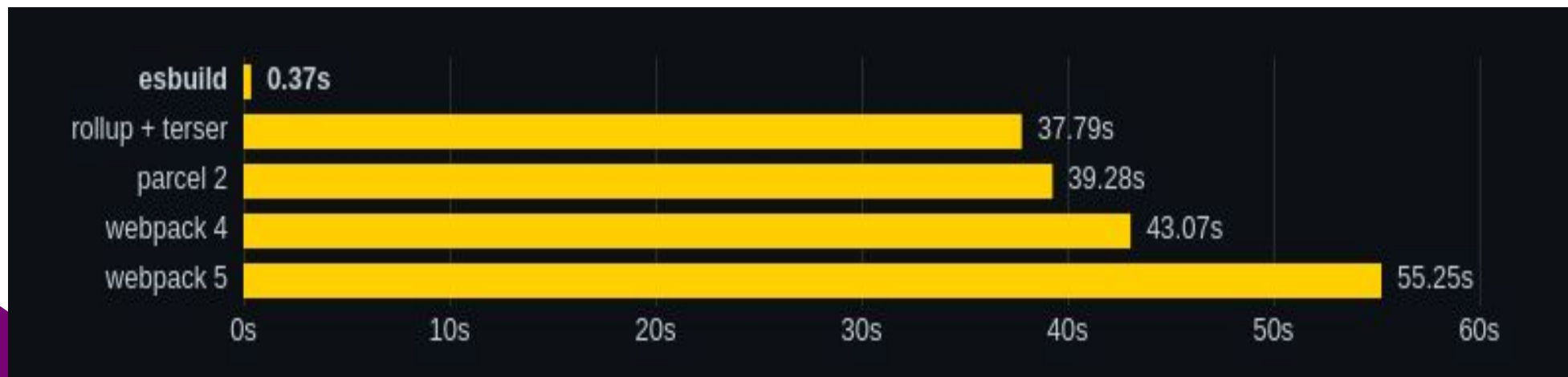
# Technologies Utilized

1. TypeScript – Programming Language
2. React – Frontend Framework
3. Redux – State Manager
4. EsBuild – A JavaScript bundler written in Golang
5. Bulma CSS – Styling library
6. iframes – for safe code execution

# ESBuild

.The main goal of the esbuild bundler project is to bring about a new era of build tool performance, and create an easy-to-use modern bundler along the way.

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# JavaScript Transpiling and Bundling

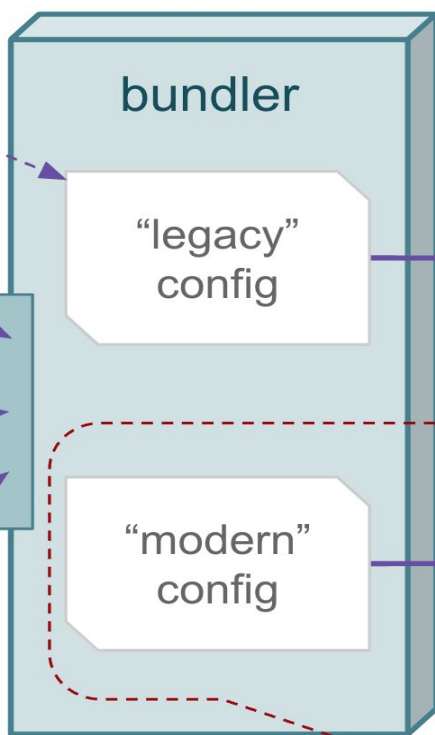
## App Source

polyfills

a.js

b.js

c.js



## Bundled Output

legacy.js  
(for old browsers)

modern.js  
(for new browsers)

- transpiled
- includes polyfills & works

- modern syntax
- few/no polyfills
- A-grade performance

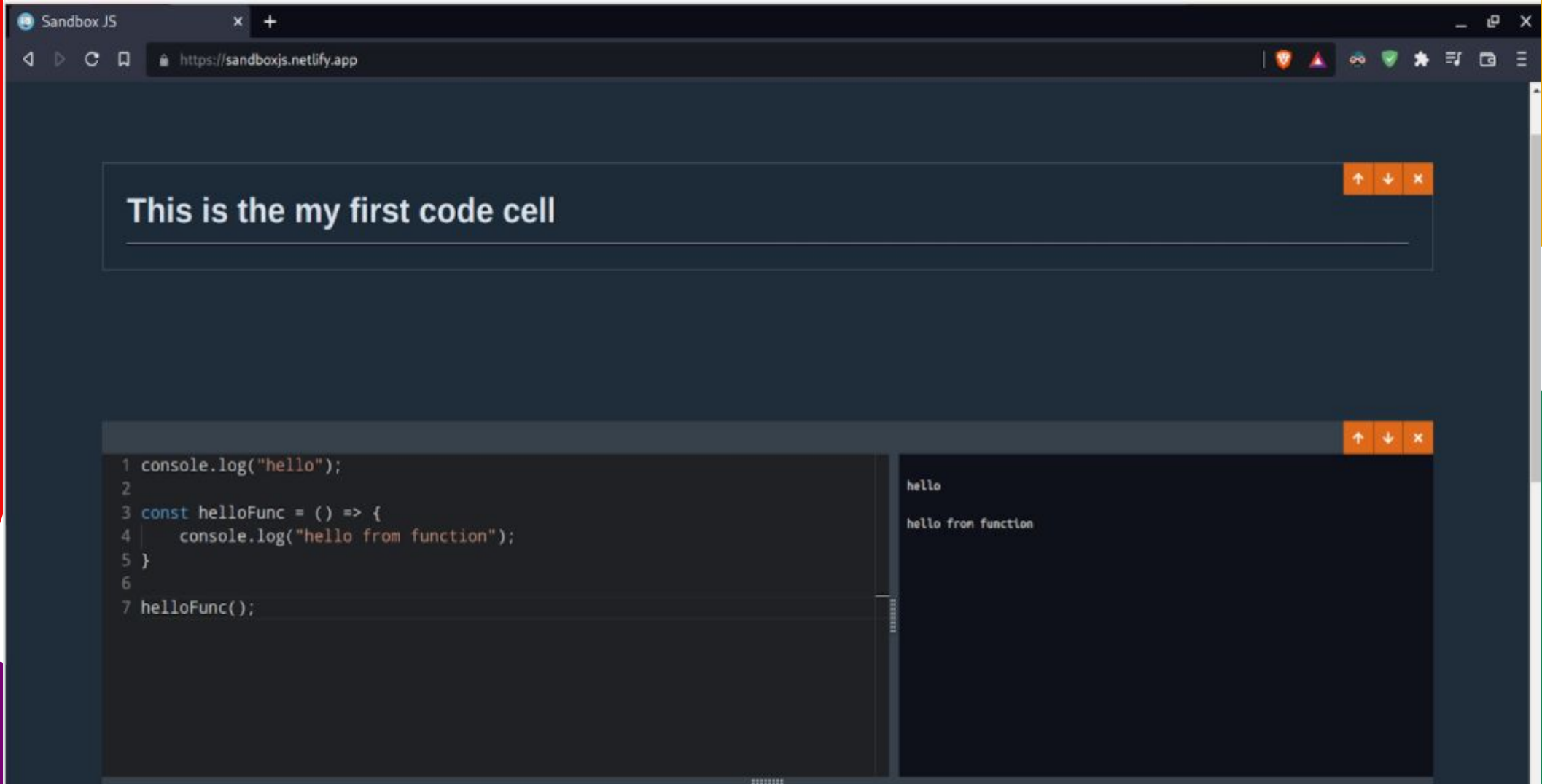
new

# iframes

An IFrame (Inline Frame) is an HTML document embedded inside another HTML document on a website.

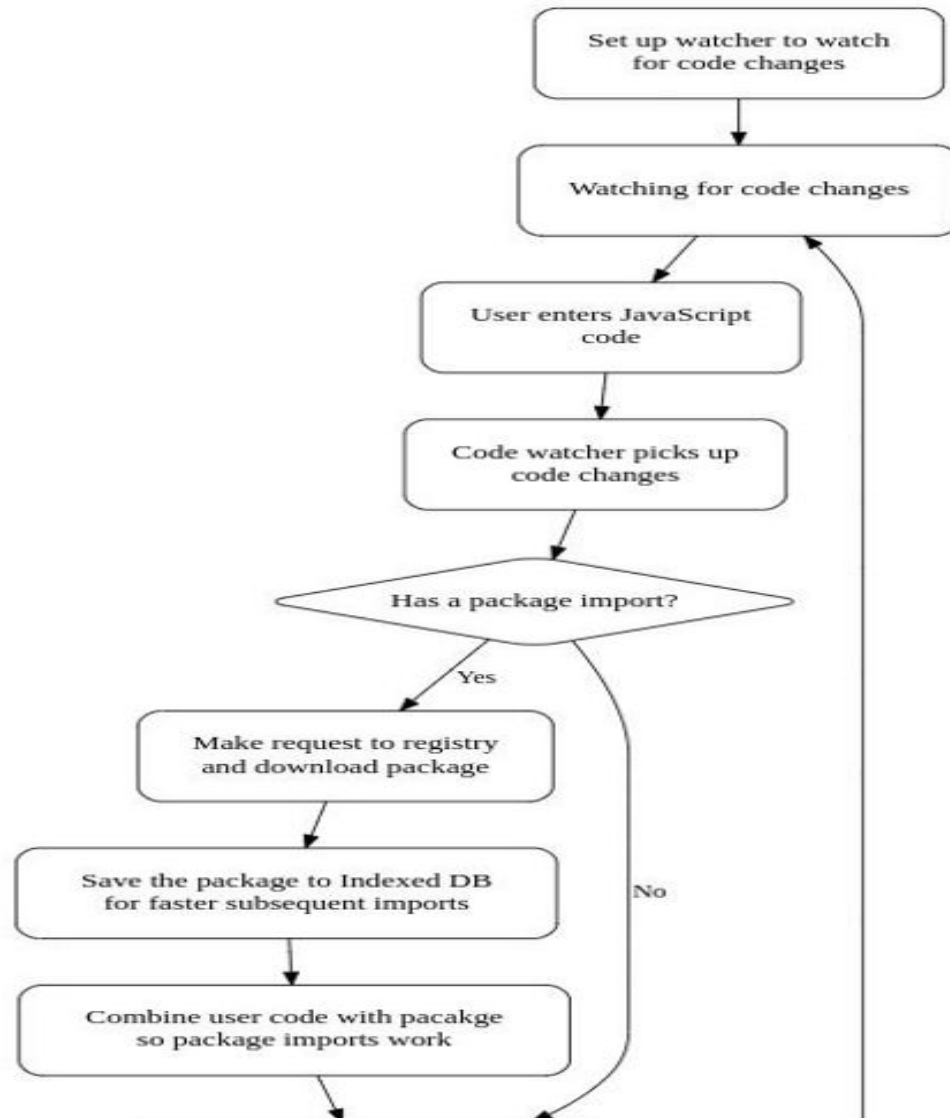
The IFrame HTML element is often used to insert content from another source, such as an advertisement, into a Web page.

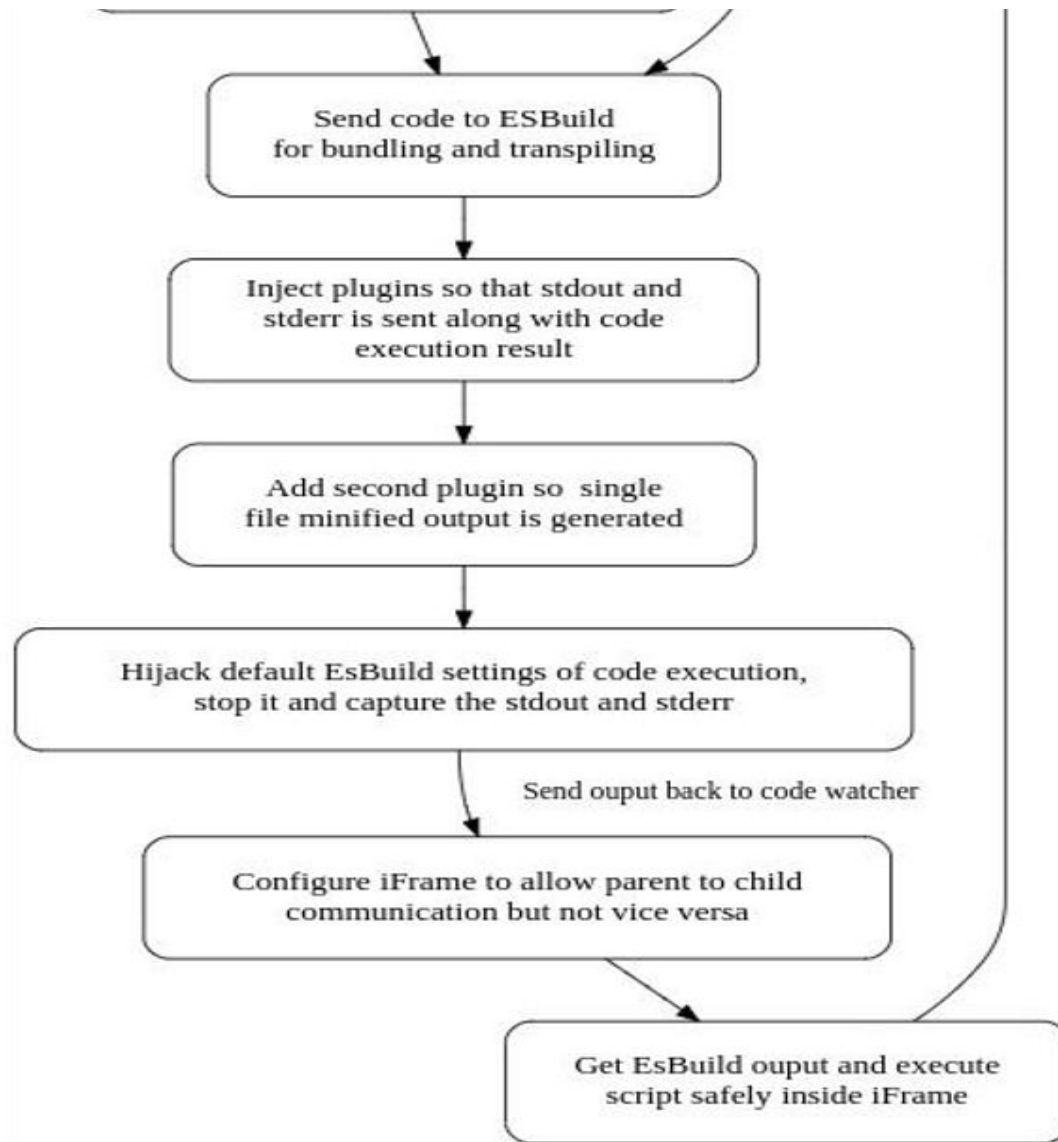
Although an IFrame behaves like an inline image, it can be configured with its own scrollbar independent of the surrounding page's scrollbar..





# Workflow





# Project Overview

- .Transpiling JavaScript code through the browser and providing instantaneous results.
- .Leveraging ESBuild and WebAssembly to achieve extremely fast code execution.
- .Implementing iframes for DOM manipulation.
- .Saving all data in JSON format so it can be shared with others.

# Additional Features

- Implement iFrame security measures and manage frame to frame parent child communication to prevent XSS attacks via code sharing.
- Get WASM compiled Python interpreter so that we will be able to run Python directly in the browser providing native experience.
- Find WASM compiler C compiler to run C directly from the browsers



Thank You