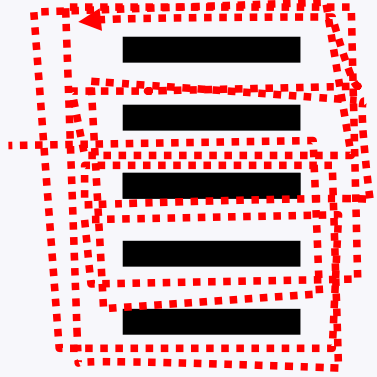
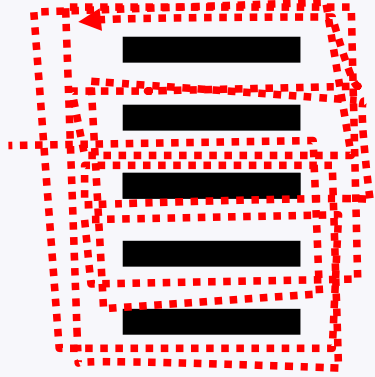


Ways to put code into actions (instructions)

Ways to put code into actions (instructions)



Ways to put code into actions (instructions)

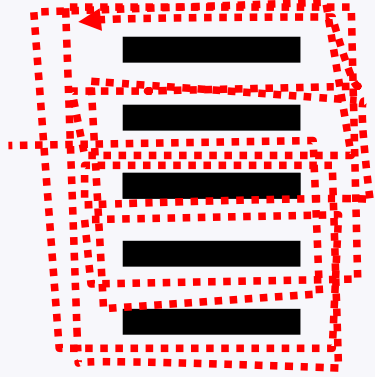


Interpreter

Immediately
runs

Not so efficient;
can run slow

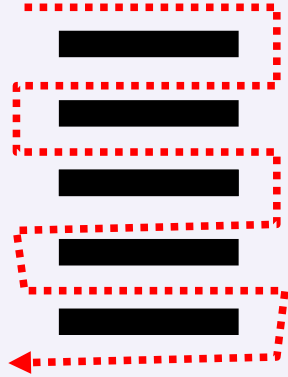
Ways to put code into actions (instructions)



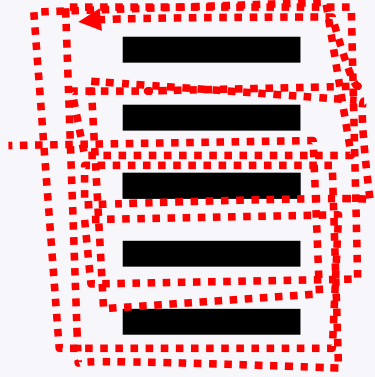
Interpreter

Immediately runs

**Not so efficient;
can run slow**



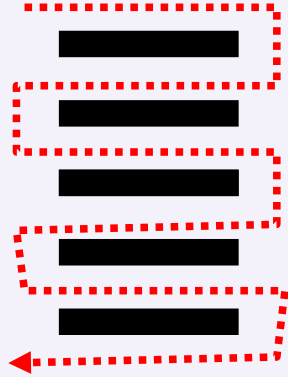
Ways to put code into actions (instructions)



Interpreter

Immediately runs

**Not so efficient;
can run slow**

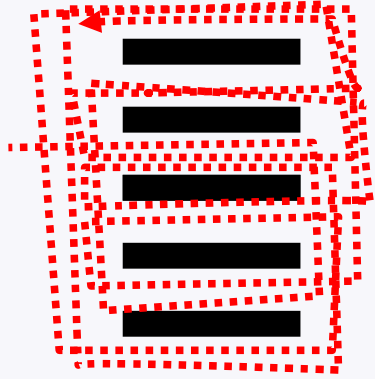


Compiler

Delay before running

Runs efficiently

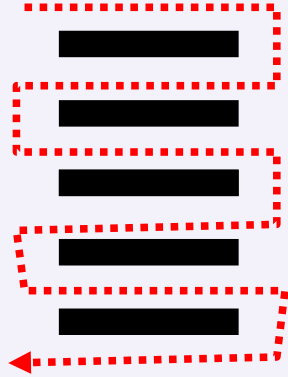
Ways to put code into actions (instructions)



Interpreter

Immediately
runs

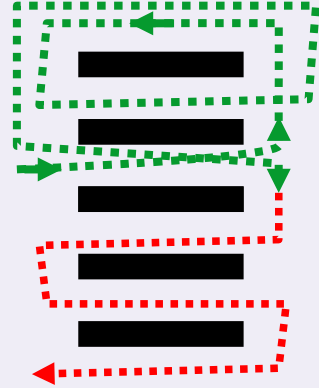
Not so efficient;
can run slow



Compiler

Delay before
running

Runs efficiently



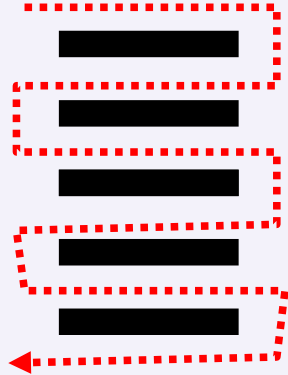
Ways to put code into actions (instructions)



Interpreter

Immediately
runs

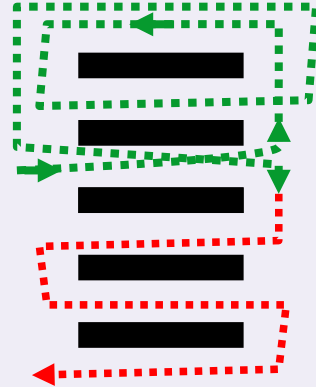
Not so efficient;
can run slow



Compiler

Delay before
running

Runs efficiently



Just-in-time

Immediately
runs

Runs very efficiently
(all browsers 2008)

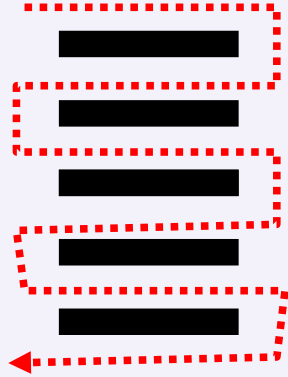
Ways to put code into actions (instructions)



Interpreter

Immediately
runs

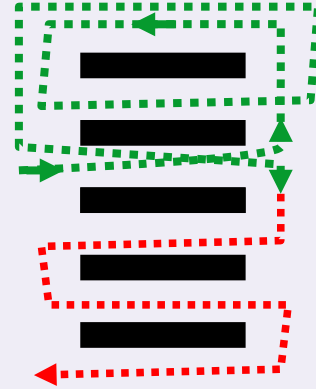
Not so efficient;
can run slow



Compiler

Delay before
running

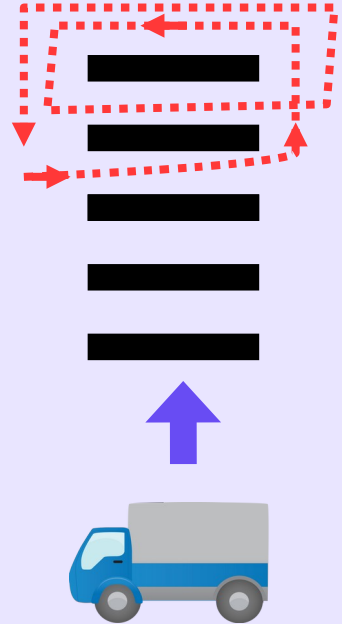
Runs efficiently



Just-in-time

Immediately
runs

Runs very efficiently
(all browsers 2008)



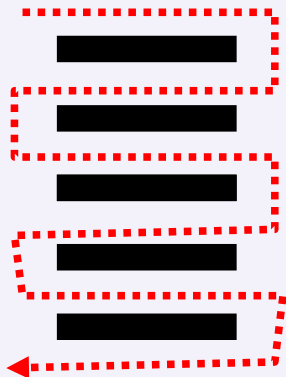
Ways to put code into actions (instructions)



Interpreter

Immediately
runs

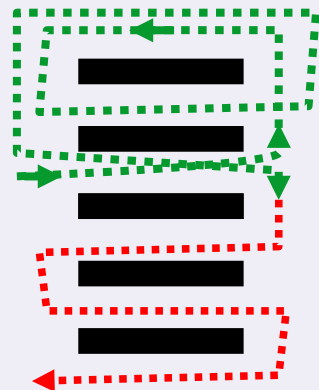
Not so efficient;
can run slow



Compiler

Delay before
running

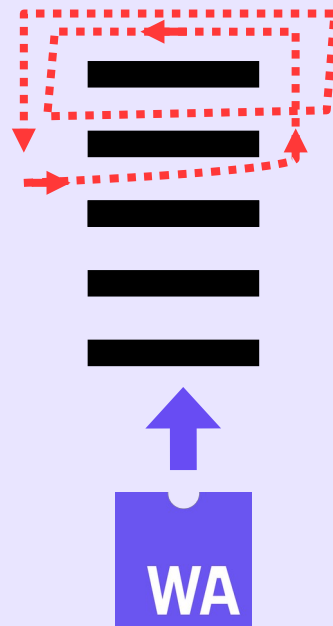
Runs efficiently



Just-in-time

Immediately
runs

Runs very efficiently
(all browsers 2008)



WebAssembly

Immediately
runs highly efficiently
(MVP 2017)

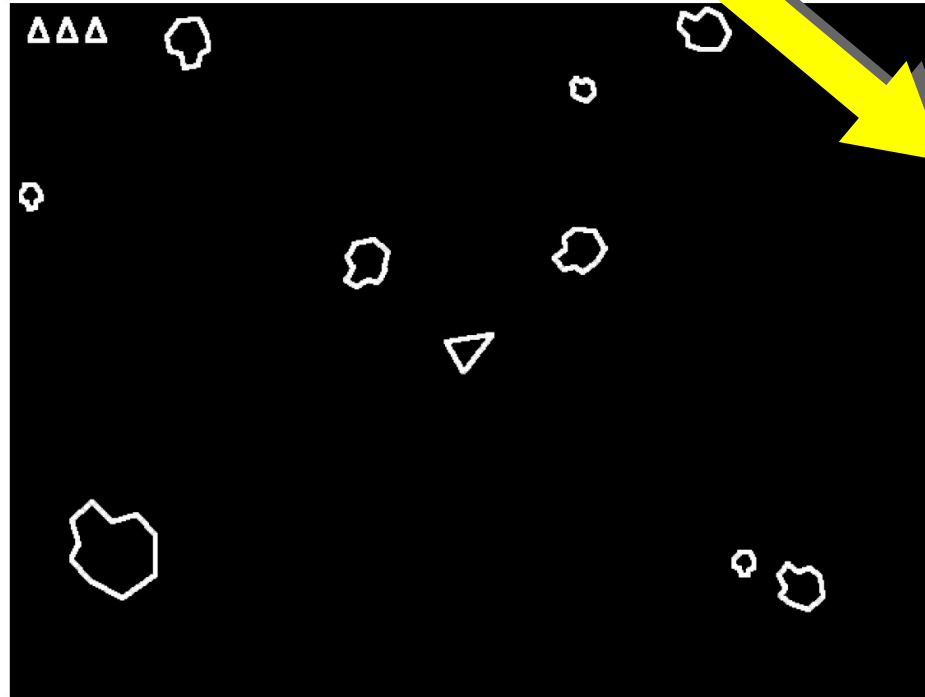
What is WebAssembly

Asteroids in WebAssembly

Code on GitHub

An [Asteroids](#) game ported from C to WebAssembly.

(Arrows to move; Spacebar to shoot)



**Written in
C NOT
JavaScript**

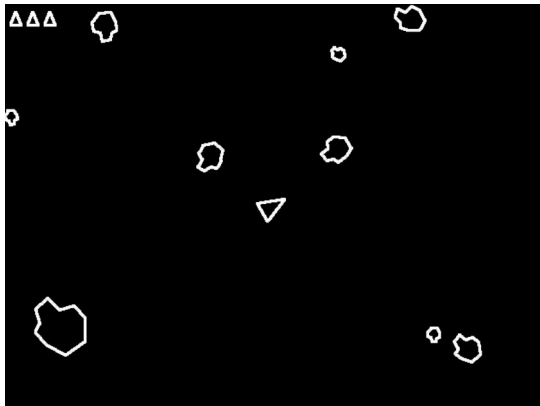
[levelupwasm.com/apps/
asteroids/index.html](http://levelupwasm.com/apps/asteroids/index.html)

What is WebAssembly

Asteroids in WebAssembly

[Code on GitHub](#)

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(Arrows to move, Spacebar to shoot)



Want to learn how to port games like this one to the web? Check out my book [Level Up with WebAssembly](#).

Page

Filesystem

⌵

⋮

index.html x

loading.gif

asteroids.js

⌵

▼ top

▼ www.levelupwasm.com

▼ apps/asteroids

index.html

asteroids.js

loading.gif

▶ stackpath.bootstrapcdn.com

▶ wasm

1 <!doctype html>

2 <html lang="en">

3 <head>

4 <meta charset="utf-8">

5 <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">

6 <meta name="description" content="Asteroids game ported from C to WebAssembly">

7 <meta name="author" content="Robert Aboukhalil">

8 <title>Asteroids Game in WebAssembly</title>

9

10 <!-- Bootstrap core CSS -->

11 <link href="https://stackpath.bootstrapcdn.com/bootstrap/4.3.1/css/bootstrap.min.css" rel="stylesheet">

12

13 <style>

14 body { padding-top: 5rem; }

15 .starter-template { text-align: center; }

16 canvas { display: block; margin: 0 auto; }

17 </style>

18 </head>

19 <body>

20 <nav class="navbar navbar-expand-md navbar-dark bg-dark fixed-top">

21 Asteroids in WebAssembly

22 <button class="navbar-toggler" type="button" data-toggle="collapse" data-target="#navbarCollapse">

23

24 </button>

25

26 <div class="collapse navbar-collapse" id="navbarCollapse">

27 <ul class="navbar-nav mr-auto">

28 <div>

29 GitHub

30 </div>

31 </div>

32 </nav>

33

34 <div class="starter-template">

35 <p class="lead">

36 An Asteroids game ported from C to WebAssembly.

37 <small>(Arrows to move; Spacebar to shoot)</small>

What is WebAssembly

An [Asteroids game](#) ported from C to WebAssembly.
(Arrows to move; Spacebar to shoot)

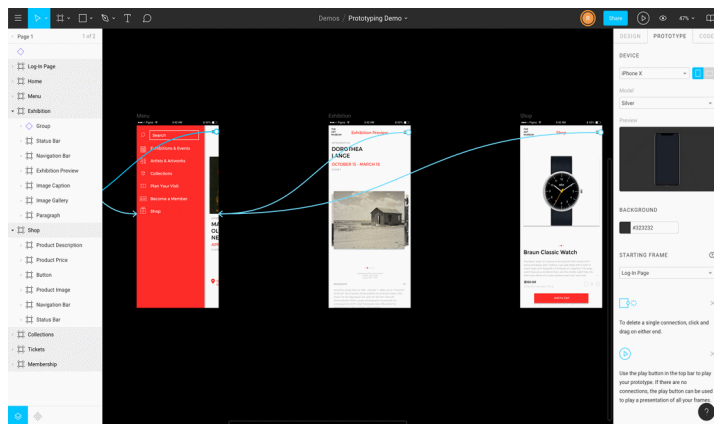
Want to learn how to port games like this one to the web? Check out my book [Level Up with WebAssembly](#).

WebAssembly code (Wasam)

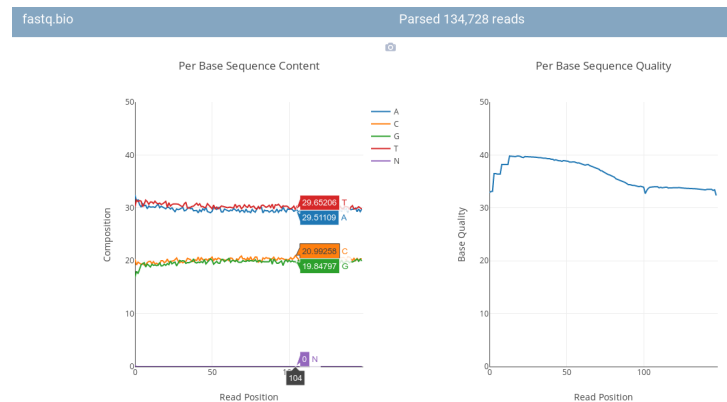
Compiled (converted) from C to WebAssembly to run directly in the browser

Why is WebAssembly important?

*Faster than
JavaScript*



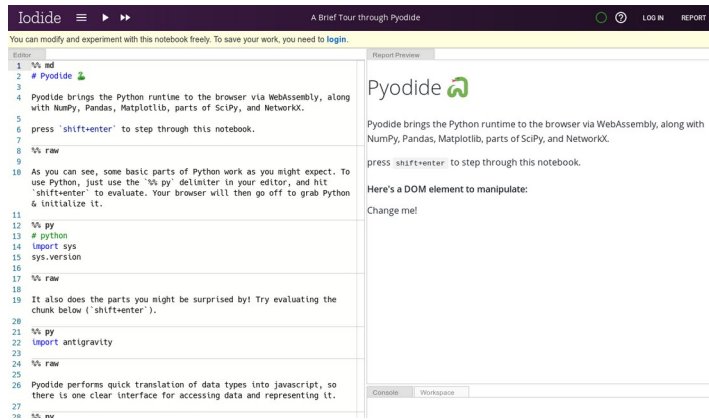
Figma 3X faster



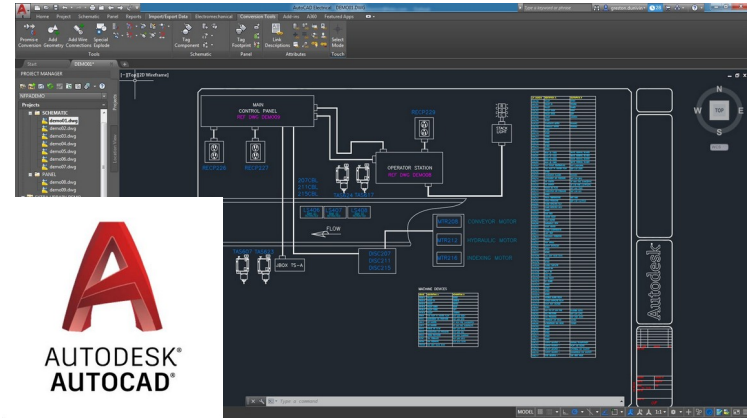
***fastq.bio DNA
sequencer 20X faster***

Why is WebAssembly important?

Run established codebase



Pyodide is Python running on the browser via webAssembly for scientific and AI



AutoCAD web version uses identical codebase as desktop - C

TL;DR

WebAssembly Code is 'shipped in'
via a **binary blob**

Allows faster execution than
JavaScript

Allows established non JavaScript
code via compiler to run on the web

The logo consists of a blue square with the white letters 'WA' inside. A white semi-circular shape is positioned above the square, resembling a speech bubble tail pointing towards the text.

WA

References

<https://hacks.mozilla.org/2017/02/a-cartoon-intro-to-webassembly/>

<https://developer.mozilla.org/en-US/docs/WebAssembly/Concepts>

<https://webassembly.org/>

<https://github.com/mbasso/awesome-wasm>

<https://github.com/robertaboukhalil/wasm-asteroids>

<https://opensource.com/article/19/4/command-line-playgrounds-webassembly>

<https://hacks.mozilla.org/2019/04/pyodide-bringing-the-scientific-python-stack-to-the-browser/>

