

Intro to Programming

Foundations of Science and Mathematics

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<https://github.com/jtwool/FSM-Intro>



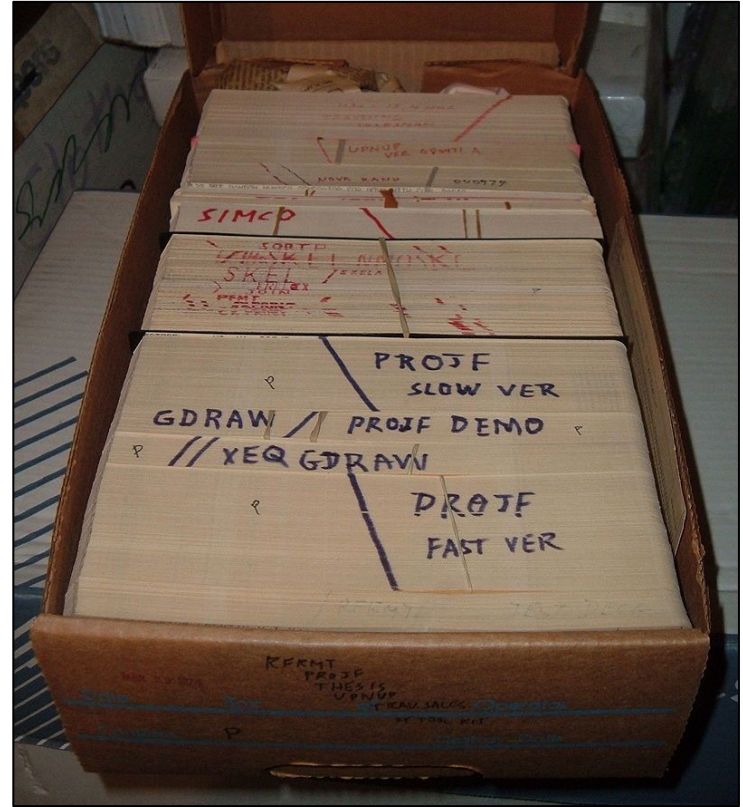
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What is programming?

Programming is a process by which people provide instructions to computers

Involves coming up with algorithms (problem solving approaches)

And writing code (instructions)



Examples of programming languages

C, Fortran

Java, C++, C#

Python, JavaScript

Lisp

"Hello world" in C

```
#include <stdio.h>
main(){("hello, world\n");}
```

"Hello world" in JavaScript

```
console.log("hello world\n")
```

JavaScript

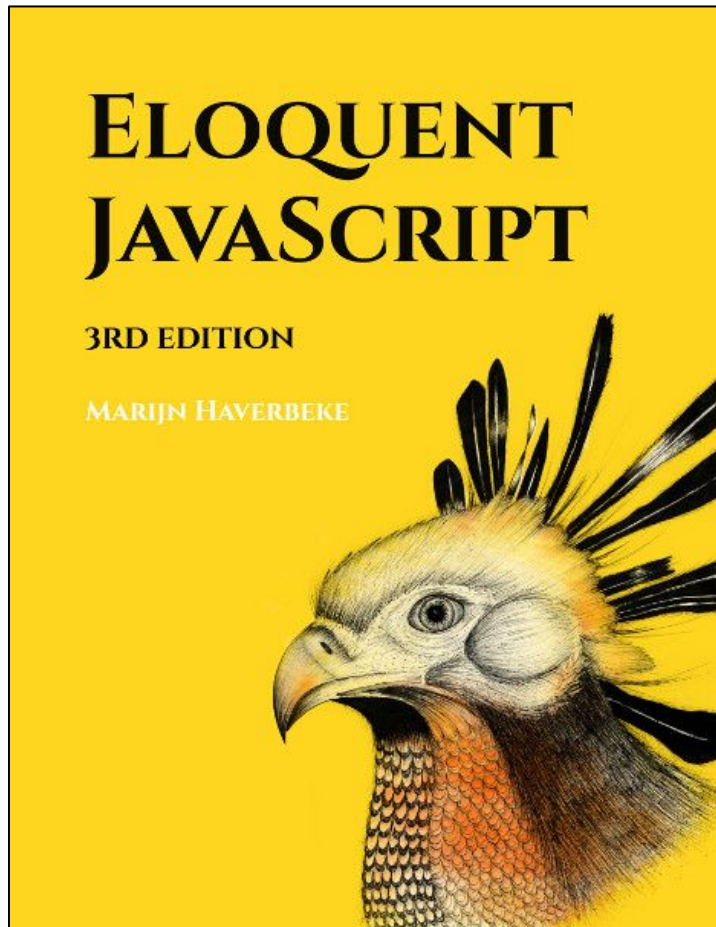
A core web technology

“Scripting” language

“Multi-paradigm”

Runs in the browser

Most popular language



Language Syntax

Syntax is the rules that define proper use of a language

Examples:

"I have a dog" v. **"I have dog"**

2+2 v. **Cat + 2**

Important things to know about JavaScript syntax

Types and Functions

Methods

Operators

Overview

Types: String, Integer, Boolean,...

Functions: function(){}

Methods: String.toLowerCase()

Operators: +, -, /, =, ==

```
// Operations with Integers
```

```
X = 4
```

```
Y = 3
```

```
Z = X + Y
```

Integers

“Counting numbers”

Add, subtract, multiply, divide,
etc.

One of the most common
types

```
// Add one function
```

```
increase = function(x){  
  return(x+1)  
}
```

```
// Subtract one function
```

```
decrease = function(x){  
  return(x-1)  
}
```

```
increase(5)
```

```
decrease(2)
```


Variables

Hold values

Can be changed

Can change types

Useful to represent “stuff”

```
// Baking pancakes
```

```
sugar = 4
```

```
flour = 5
```

```
pancakes = 0
```

```
makePancakes = function(){
```

```
    sugar -= 1
```

```
    flour -= 1
```

```
    pancakes += 3
```

```
}
```

```
makePancakes()
```

Functions

Do stuff

Can take input

Can provide output

Only run when called

```
// Buying kittens
```

```
kittens = 0
```

```
money = 100
```

```
buyKittens = function(n){
```

```
  // Buy n kittens
```

```
  kittens += n
```

```
  // Each kitten costs 10
```

```
  money -= n*10
```

```
}
```

```
buyKittens(2)
```

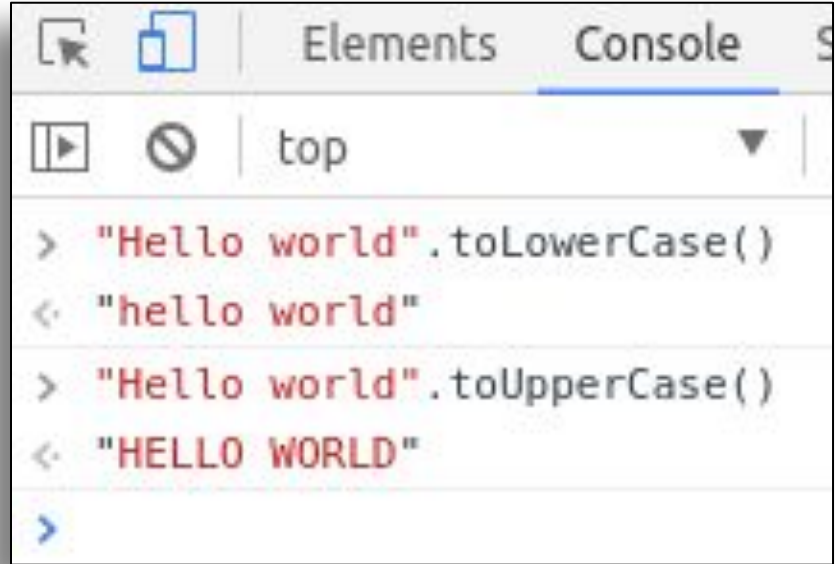
```
buyKittens(1)
```

How to Write Code

Edit a .JS file

Using any text editor or “IDE”
(integrated development
environment)

Play around right in your
browser (hit F12→ Console)



Pairs programming problem sets

Complete the functions to solve the problems.

Work in pairs. Take turns writing (typing) the code.

Get through as many problems as you can.

~20-30 minutes.

```
// Example problem  
add2 = function(x){  
  // Add 2 to X  
}
```

```
// Example solution  
add2 = function(x){  
  return(x+2)  
}
```