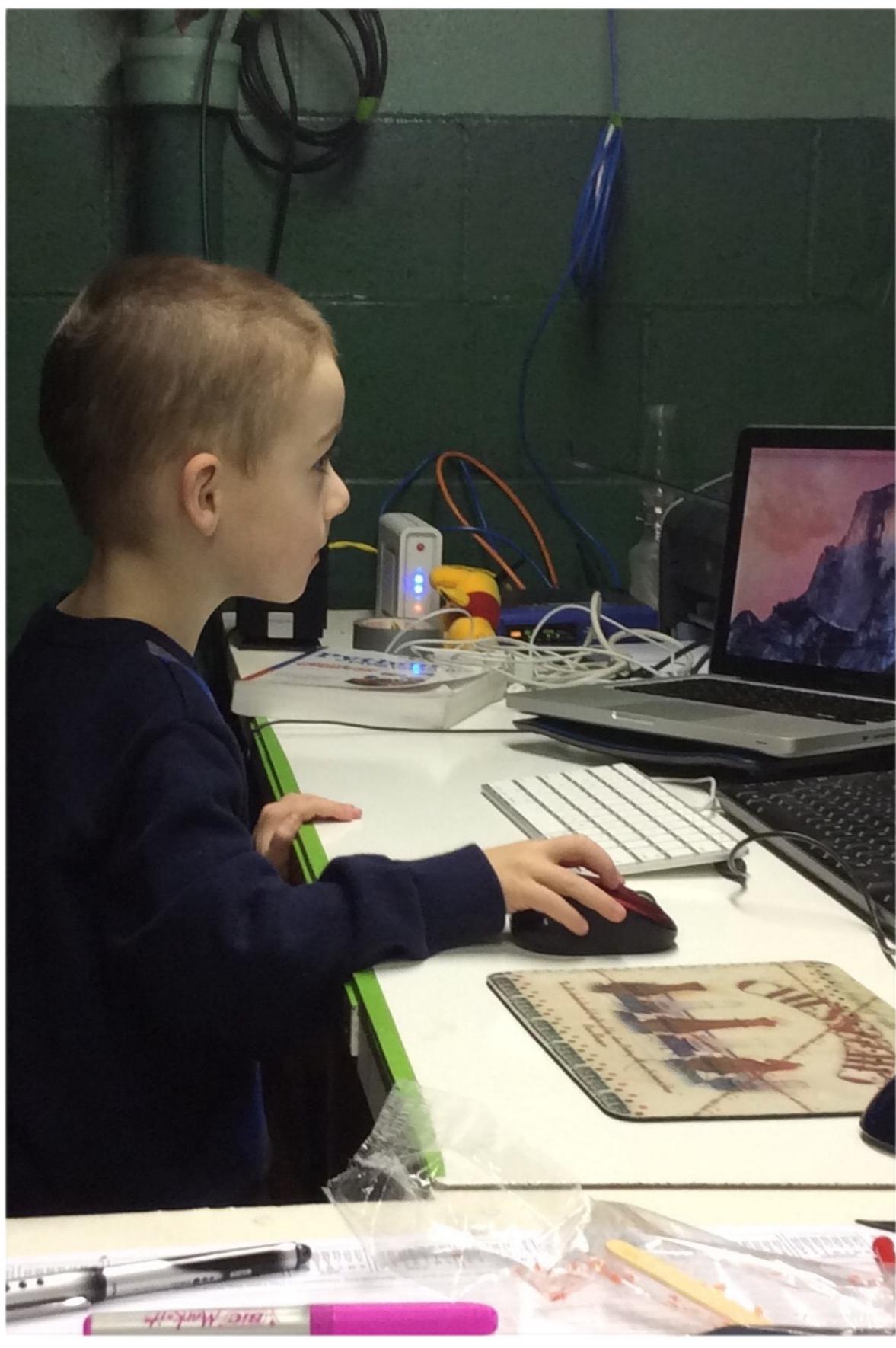


**SO, YOU WANT  
(SOMEONE ELSE)  
TO LEARN TO  
CODE!?**





“

PROGRAMMERS ARE NOW BUILDING THE WORLD. ANYONE IN THE WORLD WILL LIVE IN THE WORLD WE BUILD. THE SYSTEMS THAT GOVERN US. THE SYSTEMS THAT GOVERN OUR RELATIONS. THE WAY WE ARE EDUCATED. THE WAY WE ARE FORMED. PROGRAMMERS ARE QUITE IMPORTANT.

— *Daniel Procida*

”



“

“Learning how to program changes the way you think about, debug, and interact with the world.”

“You learn a set of rules to build software, ... then you learn that you can change the rules.”

“Programmers master a system they know they can change.”

“We take for granted that changing something to make it better is just a thing you do when you need to.”

“This can and should carry over to the rest of your life.”

— *Jessica McKellar*

”

徐行



楊王由岩校

# VOCABULARY

variable

class

cryptography

instance

agile

abend

boolean

hash table

instantiate

concurrency

brute force

stack

big O

# VOCABULARY

variable	class	polymorphism	P vs NP
parallelism	instance	api	agile
instantiate	abend	boolean	semantic versioning
heap	waterfall	parameter	hash table
root kit	recursion	brute force	concurrency
abstract base class		stack	big O
		algorithm	allocate
		pure virtual function	

徐子



徐子

## \*Unsaved Document 1

File Edit View Search Tools Documents Help

```
#include <iostream.h>

void main(int)
{
    int length, width;
    int perimeter, area;
    cout << "Length = ";
    cin >> length;
    cout << "Width = ";
    cin >> width;
    perimeter = 2*( length+width );
    area = length*width;
    cout << endl << "Perimeter is " << perimeter;
    cout << endl << "Area is " << area
        << endl;
```

\*Unsaved Document 1

File Edit View Search Tools Documents Help

```
1
2 #include <iostream.h>
3
4 void main(int)
5 {
6     int length, width;
7     int perimeter, area;
8     cout << "Length = ";
9     cin >> length;
10    cout << "Width = ";
11    cin >> width;
12    perimeter = 2*( length+width);
13    area = length*width;
14    cout << endl << "Perimeter is " << perimeter;
15    cout << endl << "Area is " << area
16        << endl;
```

\*ex1.cpp (~)

File Edit View Search Tools Documents Help

C ex1.cpp

```
1 #include <iostream.h>
2
3 void main(int)
4 {
5     int length;
6     int width;
7     int perimeter;
8     int area;
9
10    cout << "Length = ";
11    cin >> length;
12    cout << "Width = ";
13    cin >> width;
14    perimeter = 2 * (length + width);
15    area = length * width;
16    cout << endl << "Perimeter is " << perimeter;
17    cout << endl << "Area is " << area << endl;
18
19 }
```

Effects

Include preprocessor

Include the window border

Application: None

Cancel

□ C++ ▾ Tab Width: 4 ▾ Ln 11, Col 6 INS

File Hashflag / Classes / jt\_EstablishmentObject.m -findSharedLinks: Superclasses NSObject @interface NSObject

```

// just in case the string ends with the link
if ( endRange.location == NSNotFound )
    endRange.location = [tempString length];

NSString *linkTag = [tempString substringWithRange: NSMakeRange(0, endRange.location )];

// see if we've found this one already
NSFetchRequest *theRequest = [[[NSFetchRequest alloc] init]
    autorelease];
NSEntityDescription *theEntity = [NSEntityDescription
    entityForName: @"TweetedURL"]

[inManagedObjectContext
    context: [[NSApp
        delegate]
    managedObjectContext]];
[theRequest setEntity: theEntity];
NSPredicate *thePred = [NSPredicate predicateWithFormat:
    @"theURLString == %@", LinkTag];
[theRequest setPredicate: thePred];

NSError *theError;

NSArray *theResults = [[[NSApp
    delegate]
    managedObjectContext]
    executeFetchRequest: theRequest error: &theError];

if ( [theResults count] == 1 ) {
    [(jt_ManagedHashTag *)[theResults objectAtIndex: 0]
        incrementTheCount];
    [theReturn addObject: [theResults objectAtIndex: 0]];
}
// check whether it's a truncation
else {

    theRequest = [[[NSFetchRequest alloc] init] autorelease];
    theEntity = [NSEntityDescription
        entityForName: @"TweetedURL"
        inManagedObjectContext: [[NSApp
            delegate]
        managedObjectContext]];
[theRequest setEntity: theEntity];
thePred = [NSPredicate predicateWithFormat: @"theURLString
    contains %@", LinkTag];
[theRequest setPredicate: thePred];

NSArray *theResults = [[[NSApp
    delegate]
    managedObjectContext]
    executeFetchRequest: theRequest error: &theError];

if ( [theResults count] == 1 ) {
    [(jt_ManagedHashTag *)[theResults objectAtIndex: 0]
        incrementTheCount];
}
}

- (NSString *)description;
@end

@protocol NSCopying
- (id)copyWithZone:(NSZone *)zone;
@end

@protocol NSMutableCopying
- (id)mutableCopyWithZone:(NSZone *)zone;
@end

@protocol NSCoding
- (void)encodeWithCoder:(NSCoder *)aCoder;
- (id)initWithCoder:(NSCoder *)aDecoder;
@end

/********** Base class *****/
@interface NSObject <NSObject> {
    Class isa;
}

+ (void)load;
+ (void)initialize;
- (id)init;

+ (id)new;
+ (id)allocWithZone:(NSZone *)zone;
+ (id)alloc;
- (void)dealloc;

- (void)finalize AVAILABLE_MAC_OS_X_VERSION_10_4_AND_LATER;

- (id)copy;
- (id)mutableCopy;

+ (id)copyWithZone:(NSZone *)zone;
+ (id)mutableCopyWithZone:(NSZone *)zone;

+ (Class)superclass;
+ (Class)class;
+ (BOOL)instancesRespondToSelector:(SEL)aSelector;
+ (BOOL)conformsToProtocol:(Protocol *)protocol;
- (IMP)methodForSelector:(SEL)aSelector;

```

GNU gdb 6.3.50-20050815 (Apple version gdb-1518) (Sat Feb 12 02:52:12 UTC 2011)
Copyright 2004 Free Software Foundation, Inc.
GDB is free software, covered by the GNU General Public License, and you are
welcome to change it and/or distribute copies of it under certain conditions.
Type "show copying" to see the conditions.
There is absolutely no warranty for GDB. Type "show warranty" for details.
This GDB was configured as "x86\_64-apple-darwin".tty /dev/ttys000
[Switching to process 14113 thread 0x0]
2011-03-11 14:18:35.330 Hashflag[14113:903] here at parsingSucceededForRequest
2011-03-11 14:18:39.155 Hashflag[14113:620f] starting first user search
2011-03-11 14:18:39.156 Hashflag[14113:620f] Starting search for DrKlapperich

platformio.ini - wiring-blink - [~/Downloads/wiring-blink]

Run PIO Tasks  
(Build, Upload, Clean, ...)

DO NOT USE THIS BUTTON

```
#ifdef ENERGIA
...
#else
    #include "Arduino.h"
#endif

#ifndef LED_PIN
    // Most Arduino boards already have a LED attached to pin 13
    #define LED_PIN 13
#endif

void setup() {
    pinMode(LED_PIN, OUTPUT);      // set pin as output
}

void loop() {
    digitalWrite(LED_PIN, HIGH);   // set the LED on
    delay(1000);                 // wait for a second
    digitalWrite(LED_PIN, LOW);    // set the LED off
    delay(1000);                 // wait for a second
}
```

[env:uno]  
platform = atmelavr  
framework = arduino  
board = uno

[env:teensy31]  
platform = teensy  
framework = arduino  
board = teensy31

[env:lpmsp430g2553]  
platform = timsp430  
framework = energia  
board = lpmsp430g2553

[env:lptm4c1230c3pm]  
platform = titiva  
framework = energia  
board = lptm4c1230c3pm  
build\_flags = -DLED\_PIN=GREEN\_LED

Messages Build

```
[Fri Sep 4 14:21:32 2015] Processing uno (platform: atmelavr, board: uno, framework: arduino)
=====
scons: `pioenvs/uno/firmware.hex' is up to date.
"avr-size" --mcu=atmega328p -C -d pioenvs/uno/firmware.elf
AVR Memory Usage
=====
Device: atmega328p

Program:    998 bytes (3.0% Full)
(.text + .data + .bootloader)

Data:        9 bytes (0.4% Full)
(.data + .bss + .noinit)

=====
===== [SUCCESS] Took 1.14 seconds =====

[Fri Sep 4 14:21:33 2015] Processing teensy31 (platform: teensy, board: teensy31, framework: arduino)
=====
arm-none-eabi-g++ -o pioenvs/teensy31/firmware.elf -Os -Wl,--gc-sections,--relax -mthumb -mcpu=cortex-m4 -Wl,--defsym=__rtc_localtime=1441365694 -Wl,-T /Users/.../PlatformIO/boards/teensy31/ldscript.ld
arm-none-eabi-objcopy -O ihex -R .eeprom pioenvs/teensy31/firmware.elf pioenvs/teensy31/firmware.hex
"arm-none-eabi-size" -B -d pioenvs/teensy31/firmware.elf
text      data      bss      dec      hex filename
10040     1232     2268    13540    34e4  pioenvs/teensy31/firmware.elf
=====
===== [SUCCESS] Took 1.65 seconds =====

[Fri Sep 4 14:21:35 2015] Processing lpmsp430g2553 (platform: timsp430, board: lpmsp430g2553, framework: energia)
=====
scons: `pioenvs/lpmsp430g2553/firmware.hex' is up to date
```

The screenshot shows the PlatformIO IDE interface with the following components:

- Left Sidebar:** Contains icons for Home, Checkmark, Refresh, Delete, Find, Replace, Open, Save, and Settings.
- Project Explorer:** Shows the project structure under "PlatformIO":
  - lib
  - src
    - blink.cpp
  - platformio.ini
- Code Editor:** Displays two files:
  - blink.cpp:** Shows code for initializing a LED pin as an output and starting serial communication. A tooltip "Intelligent Code Completion" is shown over the "Serial.begin" call.
  - wiring\_digital.c:** Shows the implementation of the digitalWrite function. A tooltip "Smart Code Linter" is shown over the code, and a table below lists linter results.
- Smart Code Linter Results:**

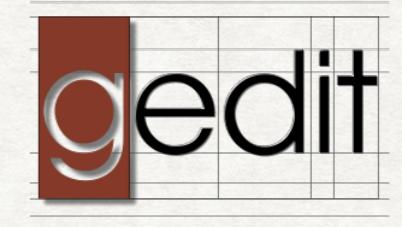
Severity	Provider	Description	Line
Error	GCC	'call_undefined' was not declared in this scope	14:18
Warning	GCC	unused variable 'warn_unused_var' [-Wunused-variable]	13:7
- Watch Variables:** Shows variables and their values for the "Serial" object and various sercom instances.
- PIO Unified Debugger:** Shows a stack trace for the "loop" function across multiple files and lines.
- Breakpoints:** Shows a breakpoint set at line 22 of "blink.cpp".
- Call Stacks:** Shows the call stack for Thread #1, starting from the "digitalWrite" function in "wiring\_digital.c".
- Bottom Status Bar:** Displays "PIO Debug", file tabs for "src/blink.cpp\*", status indicators (1 1 0), date/time (15:14), and encoding (LF UTF-8 C++).

# IDE? EDITOR?

- ❖ syntax highlighting
- ❖ auto indent
- ❖ autocomplete
- ❖ debugging
- ❖ linting
- ❖ code execution
- ❖ project organization
- ❖ snippets

# IDE? EDITOR?

- ❖ syntax highlighting
- ❖ auto indent
- ❖ autocomplete
- ❖ debugging
- ❖ linting
- ❖ code execution
- ❖ project organization
- ❖ snippets





Or You're  
**WRONG**

徐  
子



楊王由岩叔

Swift

```
println("Hello World")
```

LOL Code

```
HAI  
CAN HAS STDIO?  
VISIBLE "HAI WORLD!"  
KTHXBYE
```

Go

```
package main  
  
import "fmt"  
  
func main() {  
    fmt.Printf("Hello, World\n")  
}
```

Java

```
public class Hello {  
    public static void main(String []args) {  
        System.out.println("Hello World");  
    }  
}
```

BrainF\*\*d

```
>++++++[<+++++>] <. >+  
+++++[<++++>] <+.+++++ ..  
++ . [-]>++++++[<+++  
+>] <. >++++++[<+++>] <.  
+ .-----.-. [-]>++++  
++++[<++++>] <+. [-]+++++  
++.
```

```
>++++++[<+++++>] <. >+  
+++++[<++++>] <+.+++++ ..  
++ . [-]>++++++[<+++  
+>] <. #>++++++[<+++>]  
+>] <. >++++++[<+++>] <.  
+ .-----.-. [-]>++++  
++++[<++++>] <+. [-]+++++  
++.
```

Python3

```
print('Hello World')
```

C++

```
#include <iostream>  
  
int main()  
{  
    std::cout << "Hello, World.";  
}  
  
return 0;
```

Python2

```
print 'Hello World'
```

AppleScript

```
on helloWorld()  
    display dialog "Hello  
World!" buttons {"OK"}  
end helloWorld  
  
helloWorld()
```

徐行



```
name = input('What is your name? >')
age = input('What is your age? >')

days = int(age) * 365
hours = days * 24
minutes = hours * 60
seconds = minutes * 60

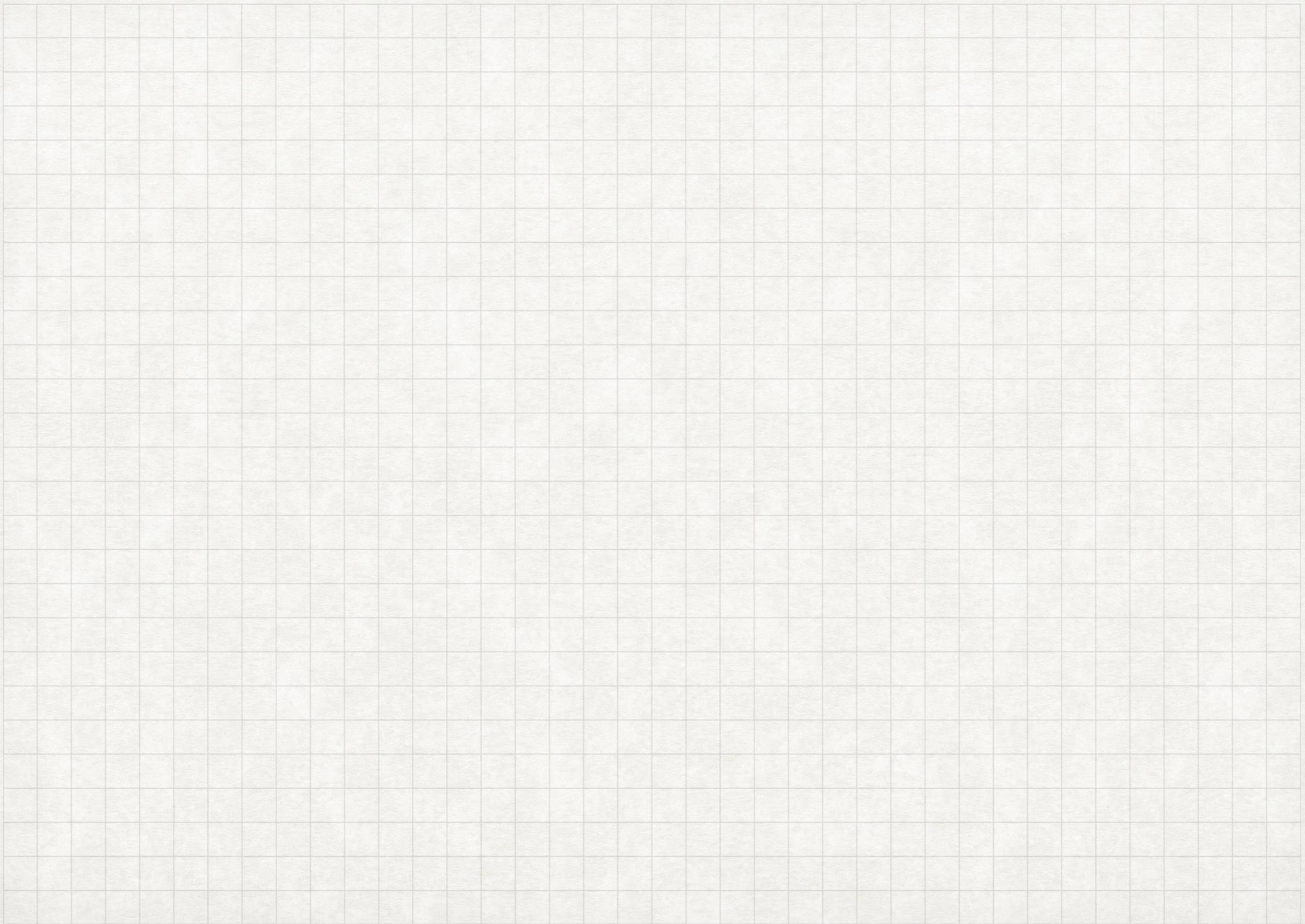
print(name + ' you are: ')
print(f'{days} days old')
print(f'{hours} hours old')
print(f'{minutes} minutes old')
print(f'{seconds} seconds old')
```

```
name = input('What is your name? >')
age = input('What is your age? >')

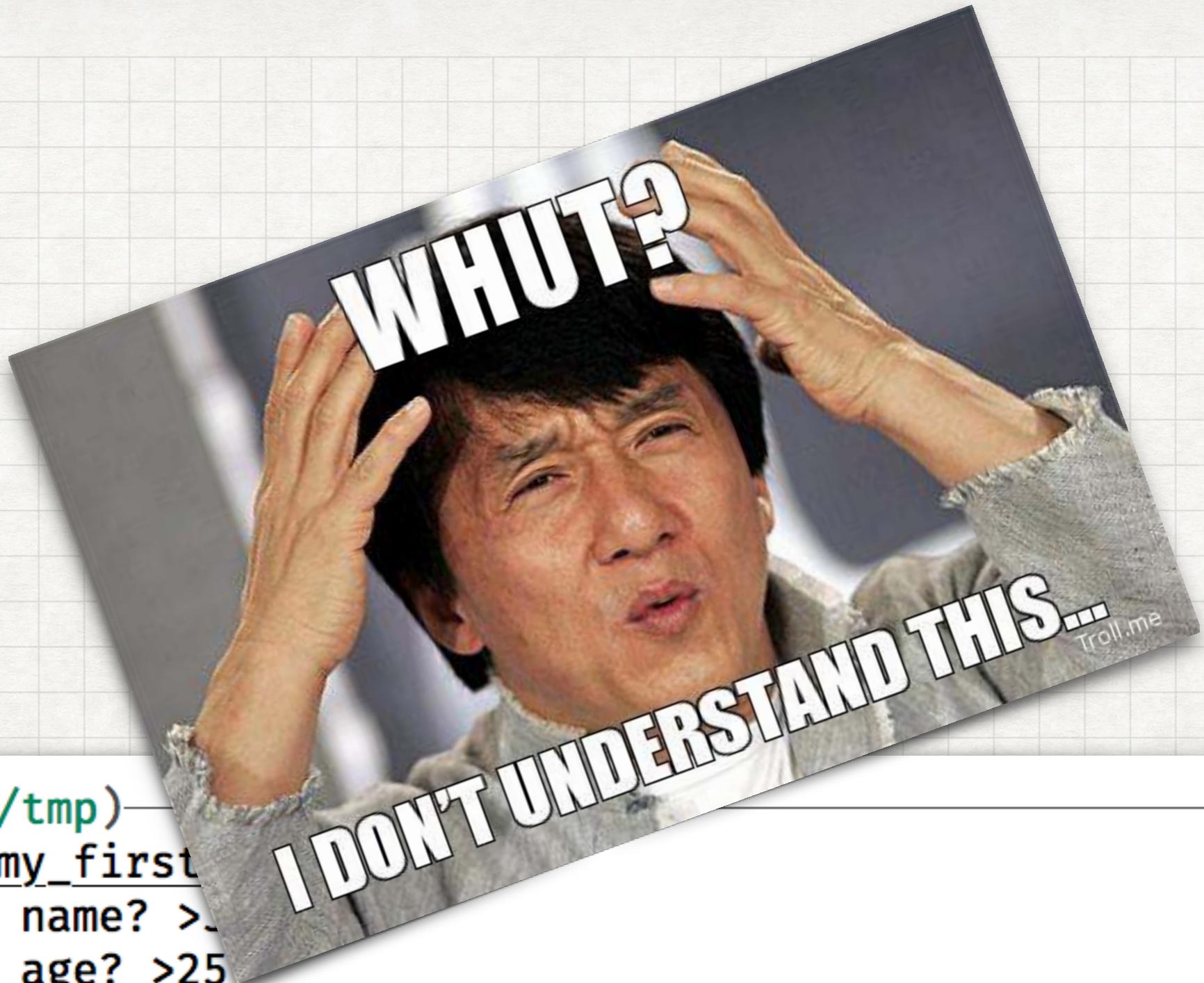
days = int(age) * 365
hours = days * 24
minutes = hours * 60
seconds = minutes * 60

print(name + ' you are: ')
print(f'{days} days old')
print(f'{hours} hours old')
print(f'{minutes} minutes old')
print(f'{seconds} seconds old')
```

```
→ python my_first_codez.py
What is your name? >Jonny
What is your age? >25
Jonny you are:
9125 days old
219000 hours old
13140000 minutes old
788400000 seconds old
```



```
(/private/tmp)
→ python my_first_codez.py
What is your name? >Johnny
What is your age? >25
Johnny you are:
Traceback (most recent call last):
  File "my_first_codez.py", line 15, in <module>
    raise SomeVagueException(err_msg)
__main__.SomeVagueException: Whoopsie, Error: Something Happen
```



```
(/private/tmp)
→ python my_first_codez.py
What is your name? >.
What is your age? >25
Johnny you are:
Traceback (most recent call last):
  File "my_first_codez.py", line 15, in <module>
    raise SomeVagueException(err_msg)
__main__.SomeVagueException: Whoopsie, Error: Something Happen
```

Software can be chaotic, but we make it work



Expert

## Trying Stuff Until it Works

O RLY?

The Practical Developer  
@ThePracticalDev

The internet will make those bad words go away



Essential

## Googling the Error Message

O RLY?

The Practical Developer  
@ThePracticalDev

Cutting corners to meet arbitrary management deadlines



Essential

## Copying and Pasting from Stack Overflow

O'REILLY®

The Practical Developer  
@ThePracticalDev

How to actually learn any new programming concept



Essential

## Changing Stuff and Seeing What Happens

O RLY?

@ThePracticalDev

Not thinking about how much pain this is going to cause in the future



Essential

## Rationalizing Your Awful Hackjob

O RLY?

@ThePracticalDev

Maybe you should have commented



## Forgetting How Your Own Code Works

//TODO: Comment

O RLY?

FunctionZero

Achievement despite ignorance



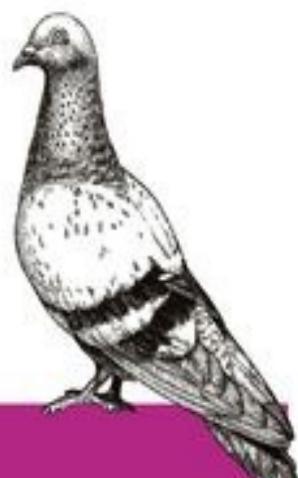
## Getting it to Work

And Having No Idea How

O RLY?

@ThePracticalDev

Probably be able explain a sorting algorithm if it ever comes up



Expert

## Vague Understanding of Computer Science

O RLY?

@ThePracticalDev

徐平



徐平

```
(/private/tmp)
→ python my_first_codez.py
What is your name? >Johnny
What is your age? >25
Johnny you are:
Traceback (most recent call last):
  File "my_first_codez.py", line 15, in <module>
    raise SomeVagueException(err_msg)
__main__.SomeVagueException: Whoopsie, Error: Something Happen
```

(/private/tmp)

→ python my\_first\_codez.py

What is your name? >Johnny

What is your age? >25

Johnny you are:

Traceback (most recent call last):

  File "my\_first\_codez.py", line 15, in <module>

    raise SomeVagueException(err\_msg)

\_\_main\_\_.SomeVagueException: Whoopsie, Error: Something Happen



❖ Language

- ❖ Language
- ❖ Design Patterns

- ❖ Language
- ❖ Design Patterns
- ❖ Algorithms

- ❖ Language
- ❖ Design Patterns
- ❖ Algorithms
- ❖ All the other stuff

1997: Let's make a website!  
\*fires up vi\*

- ❖ Language
- ❖ Design Patterns
- ❖ Algorithms
- ❖ All the other stuff

- ❖ Language
- ❖ Design Patterns
- ❖ Algorithms
- ❖ All the other stuff

1997: Let's make a website!  
\*fires up vi\*

2007: Let's make a website!  
\*downloads jQuery\*  
\*fires up vi\*

- ❖ Language
- ❖ Design Patterns
- ❖ Algorithms
- ❖ All the other stuff

1997: Let's make a website!  
\*fires up vi\*

2007: Let's make a website!  
\*downloads jQuery\*  
\*fires up vi\*

2017: Let's make a website!



This is a starter boilerplate app I've put together using the following technologies:

- Isomorphic Universal rendering
- Both client and server make calls to load data from separate API server
- React
- React Router
- Express
- Babel for ES6 and ES7 magic
- Webpack for bundling
- Webpack Dev Middleware
- Webpack Hot Middleware
- Redux's futuristic Flux implementation
- Redux Dev Tools for next generation DX (developer experience). Watch [Dan Abramov's talk](#).
- React Router Redux Redux/React Router bindings.
- ESLint to maintain a consistent code style
- redux-form to manage form state in Redux
- Iru-memoize to speed up form validation
- multireducer to combine single reducers into one key-based reducer
- style-loader, sass-loader and less-loader to allow import of stylesheets in plain css, sass and less,
- bootstrap-sass-loader and font-awesome-webpack to customize Bootstrap and FontAwesome
- react-helmet to manage title and meta tag information on both server and client
- webpack-isomorphic-tools to allow require() work for statics both on client and server
- mocha to allow writing unit tests for the project.

LOC

LET'S PLAY A GUESSING GAME

LOC

LET'S PLAY A GUESSING GAME

- Unreal Engine 3

# LOC

## LET'S PLAY A GUESSING GAME

- Unreal Engine 3
  - 2,000,000

# LOC

## LET'S PLAY A GUESSING GAME

- Unreal Engine 3
  - 2,000,000
- Minecraft

# LOC

## LET'S PLAY A GUESSING GAME

- Unreal Engine 3
  - 2,000,000
- Minecraft
  - 600,000

# LOC

## LET'S PLAY A GUESSING GAME

- Unreal Engine 3
  - 2,000,000
- Minecraft
  - 600,000
- Witcher 3

# LOC

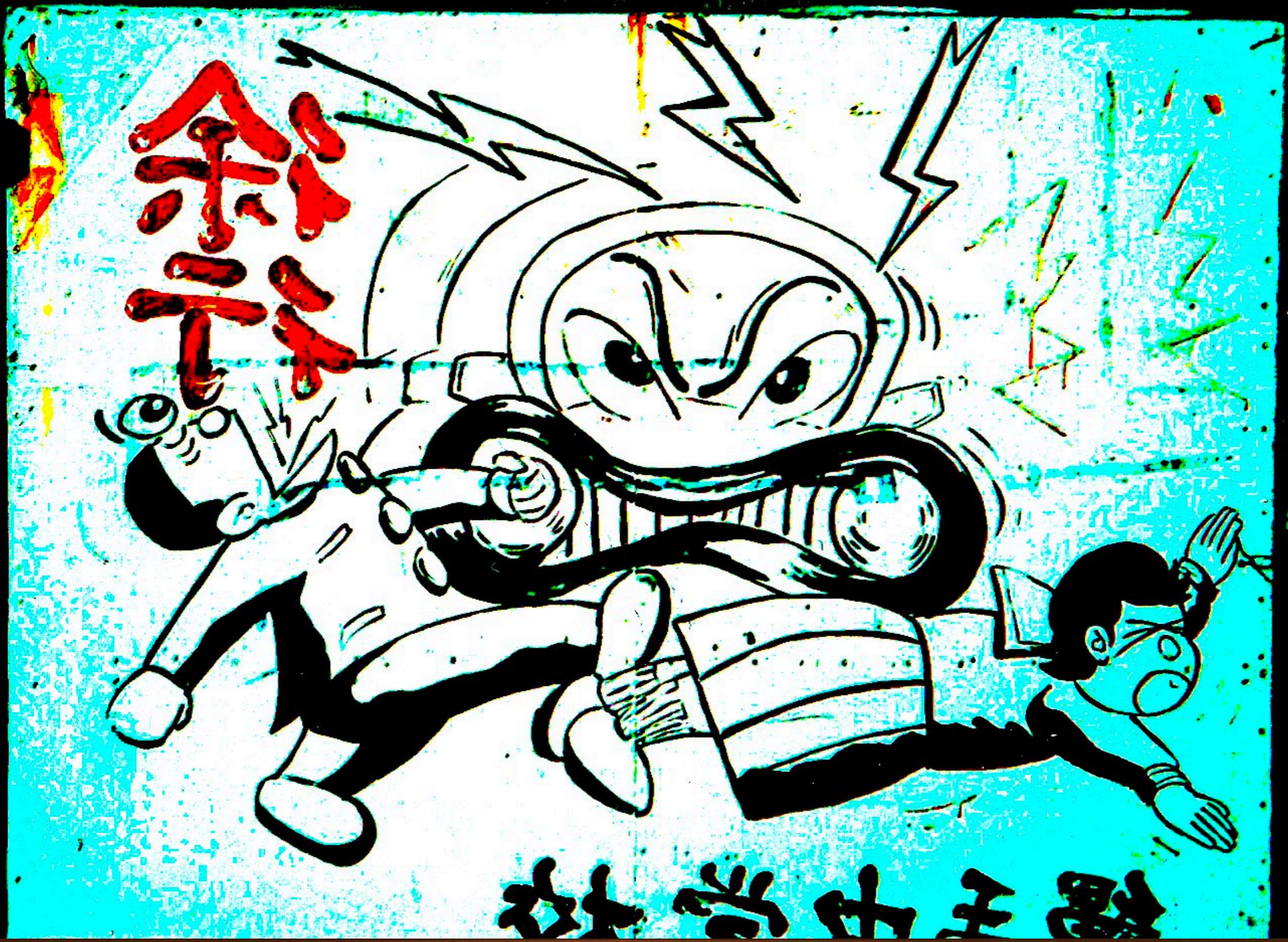
## LET'S PLAY A GUESSING GAME

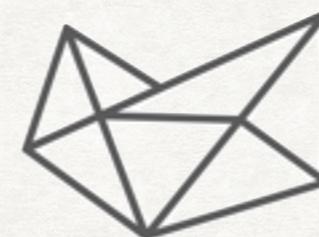
- Unreal Engine 3
  - 2,000,000
- Minecraft
  - 600,000
- Witcher 3
  - 1,500,000

# Solving Problems

"I can guarantee you, without fear of contradiction, that no software engineer will ever have to write a binary search after they are hired. It's like choosing a contractor because they know how to forge and cast steel using coal, iron, an oven and a bellows, when they actually need to know a) the address of the nearest Home Depot b) what to do with the steel once they buy it."

-Jon Evans ([Why the new guy can't code](#))





CheckiO

coursera



codecademy

lightbot™



