

This is CS 50.



**Harvard College's** Introduction to Computer Science I

# COMPUTER SCIENCE 50

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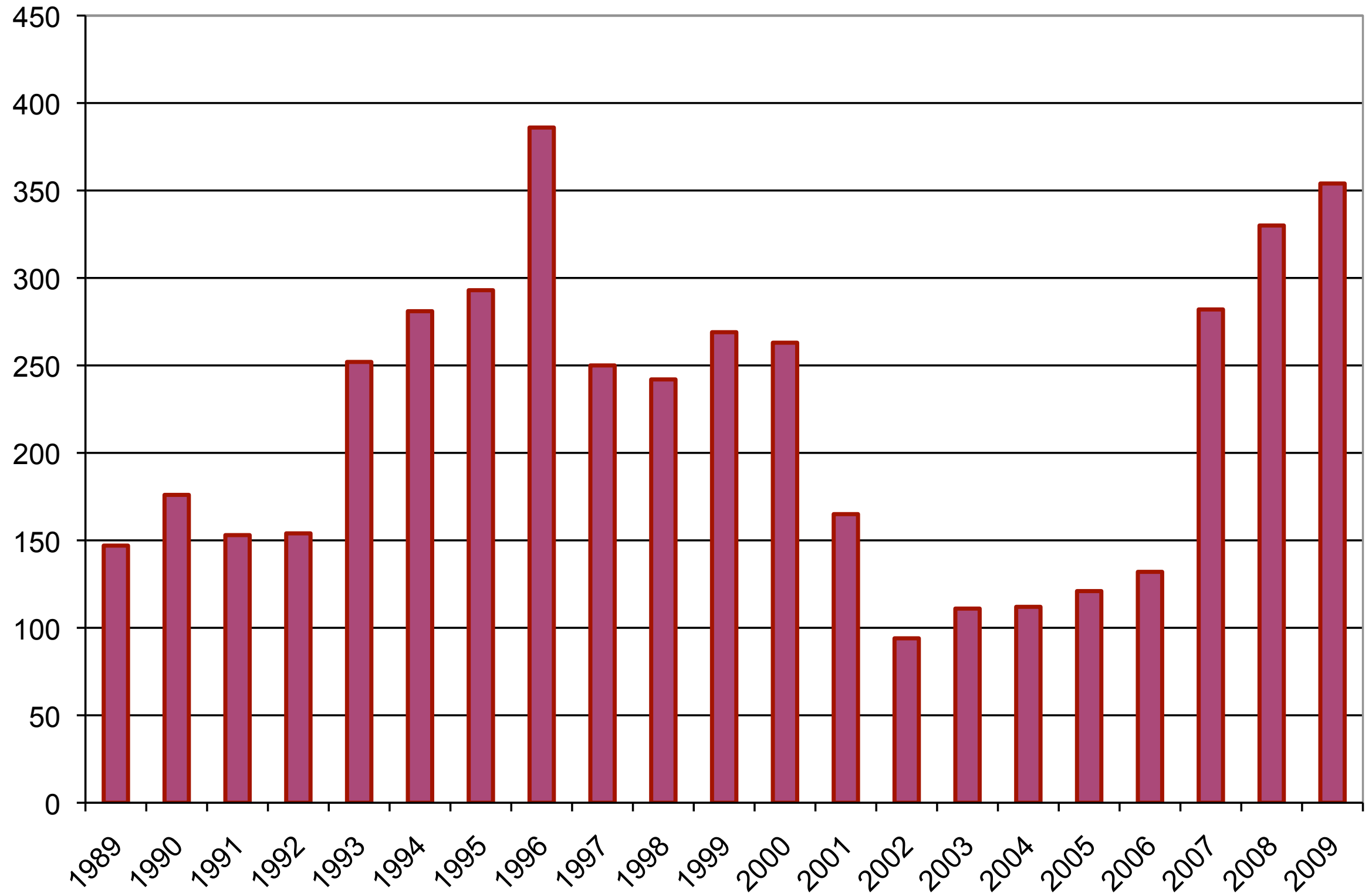
**DAVID J. MALAN**

malan@post.harvard.edu

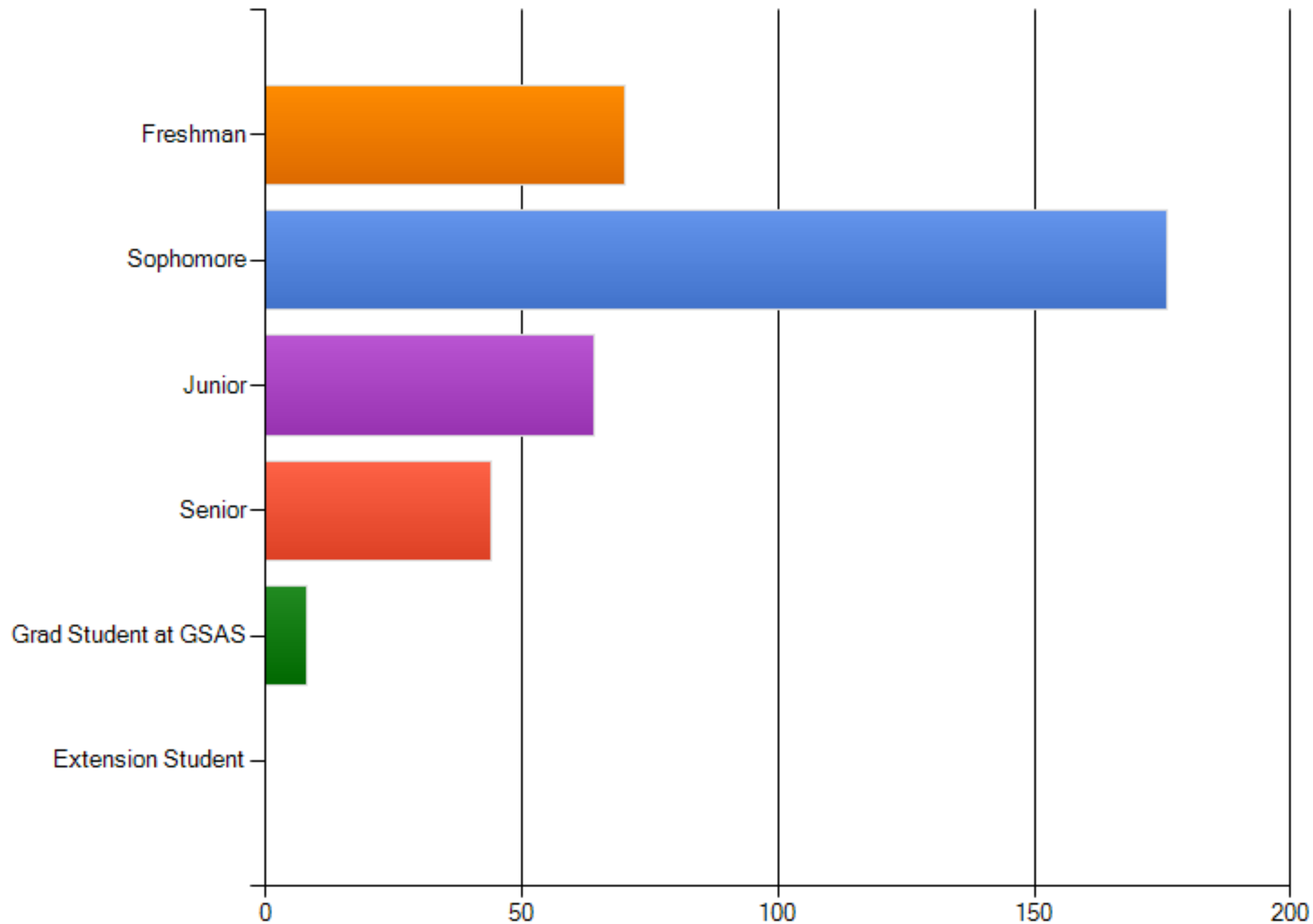
<http://www.cs50.net/>

This is CS 50.

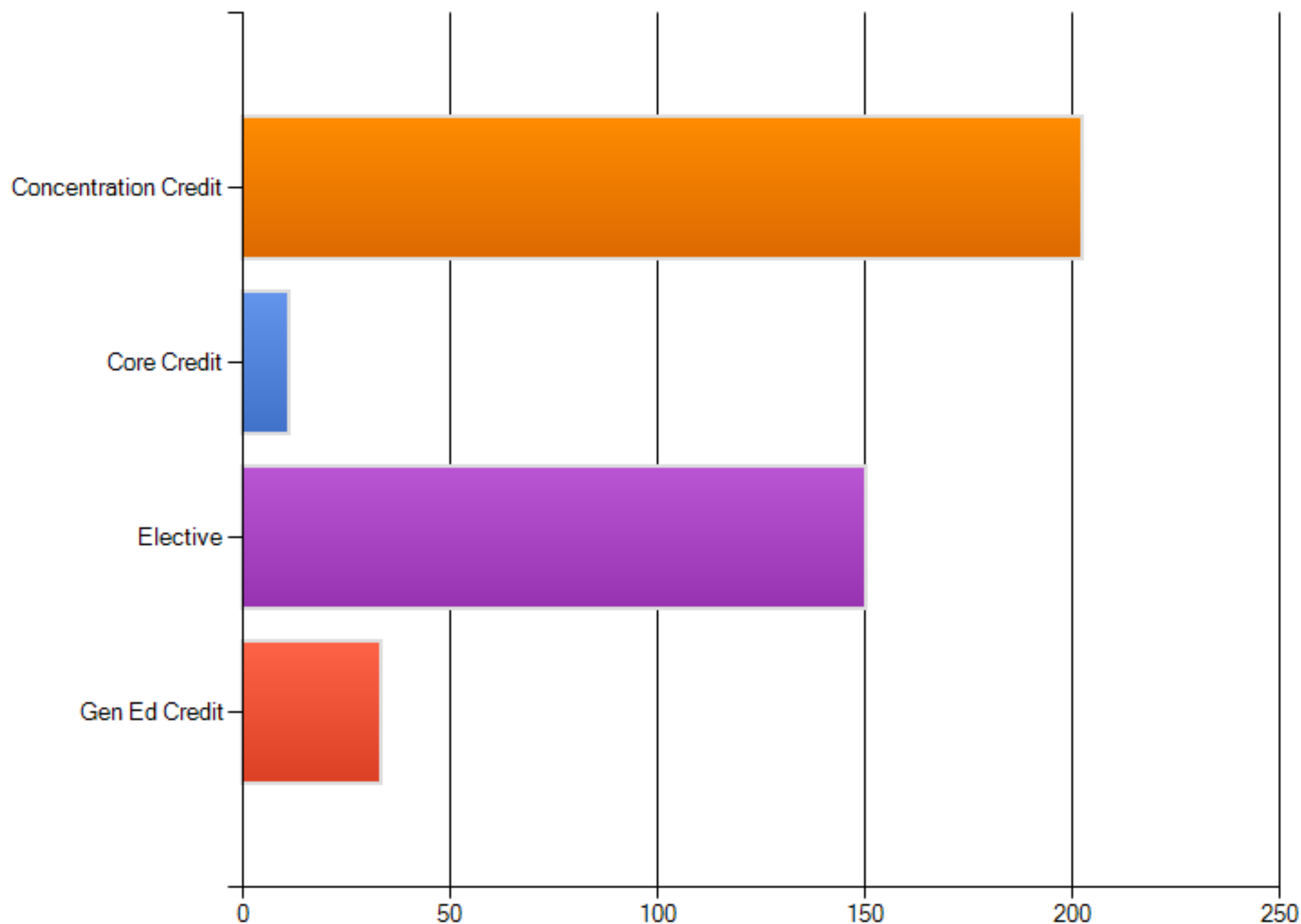
# Enrollment has increased by 168%



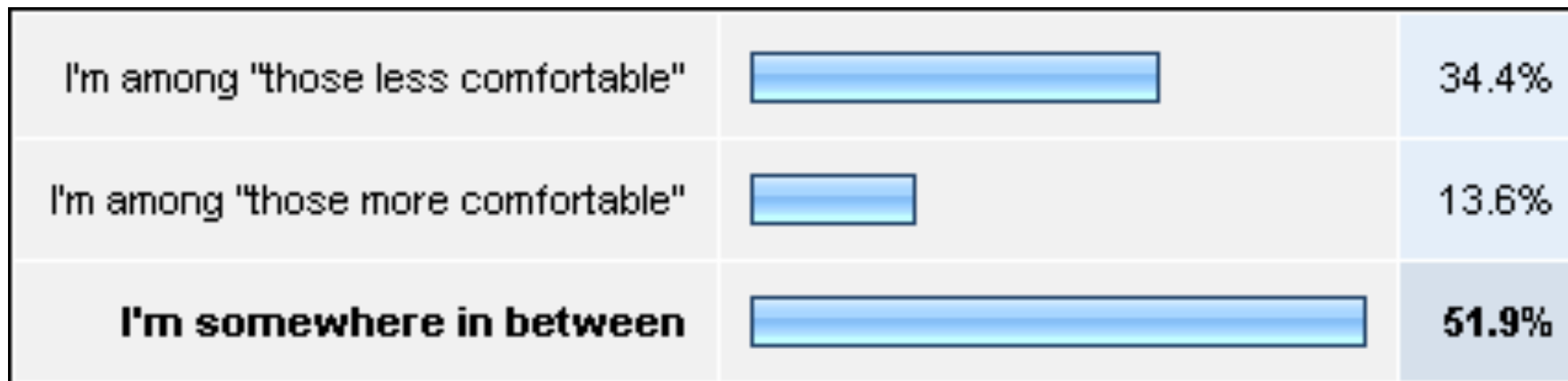
## Year



# Are you taking CS 50 for concentration credit, core credit, or as an elective?

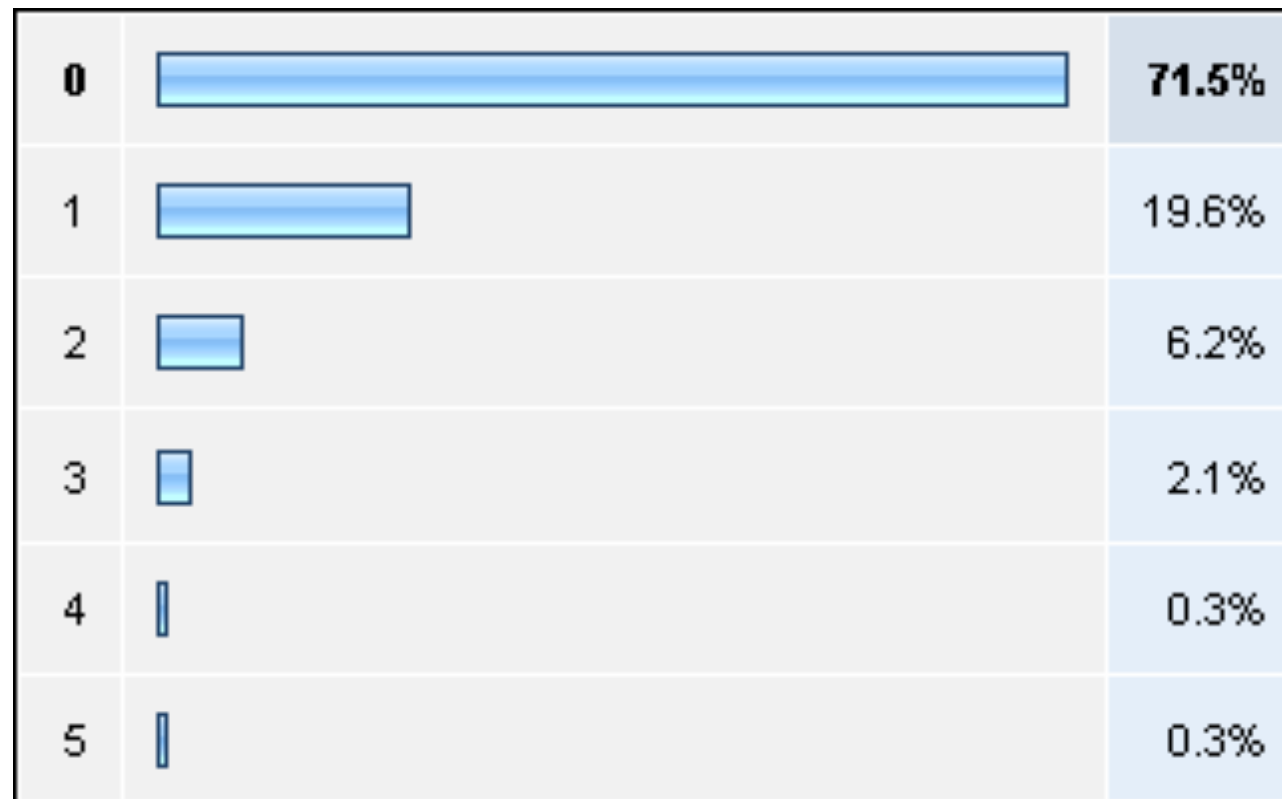


# “Does everyone know more than me?”



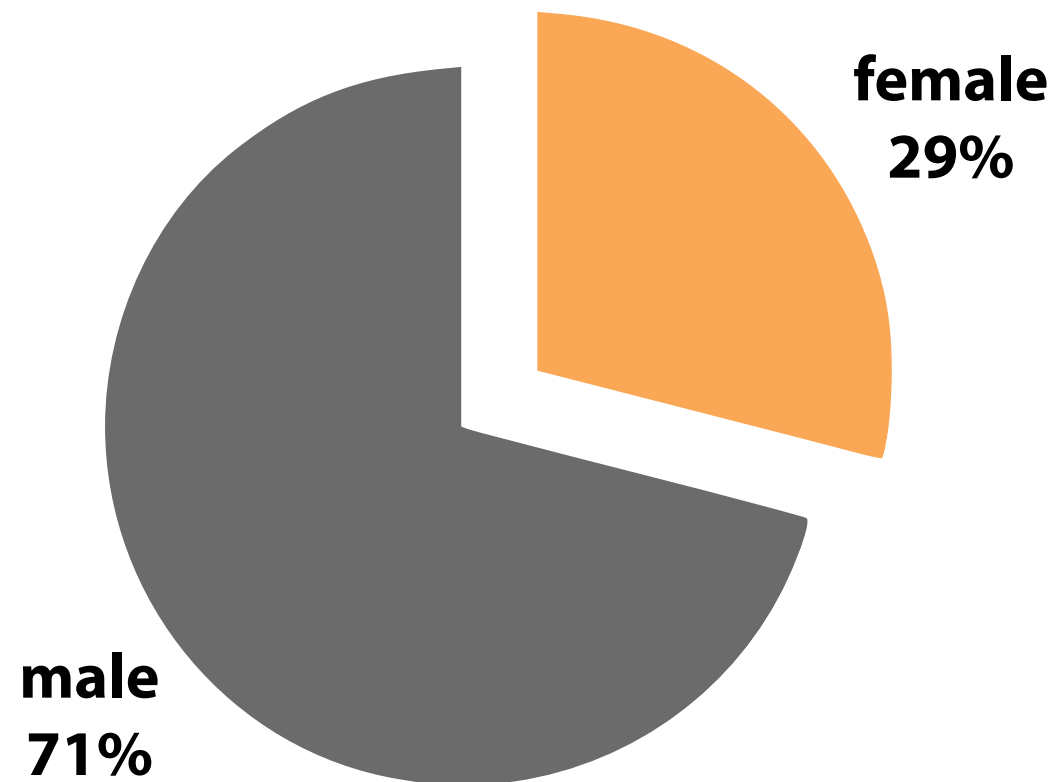


# Prior Coursework in CS

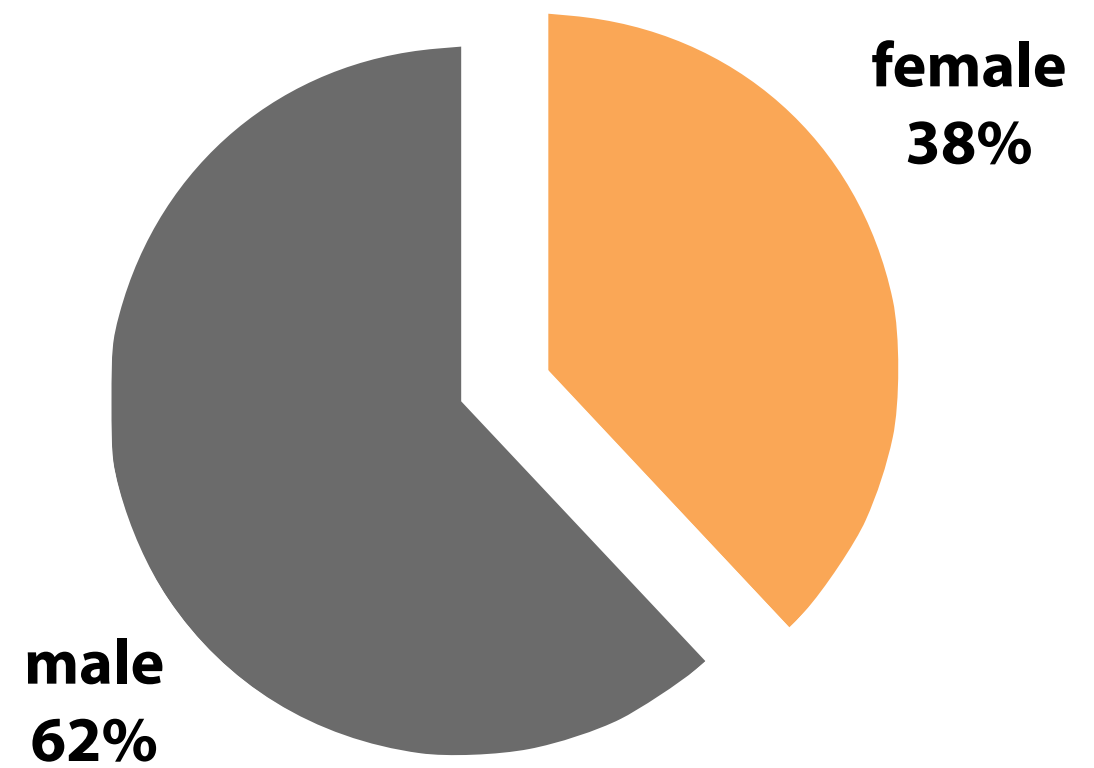


# Gender Ratio

**Fall 2007**



**Fall 2008**

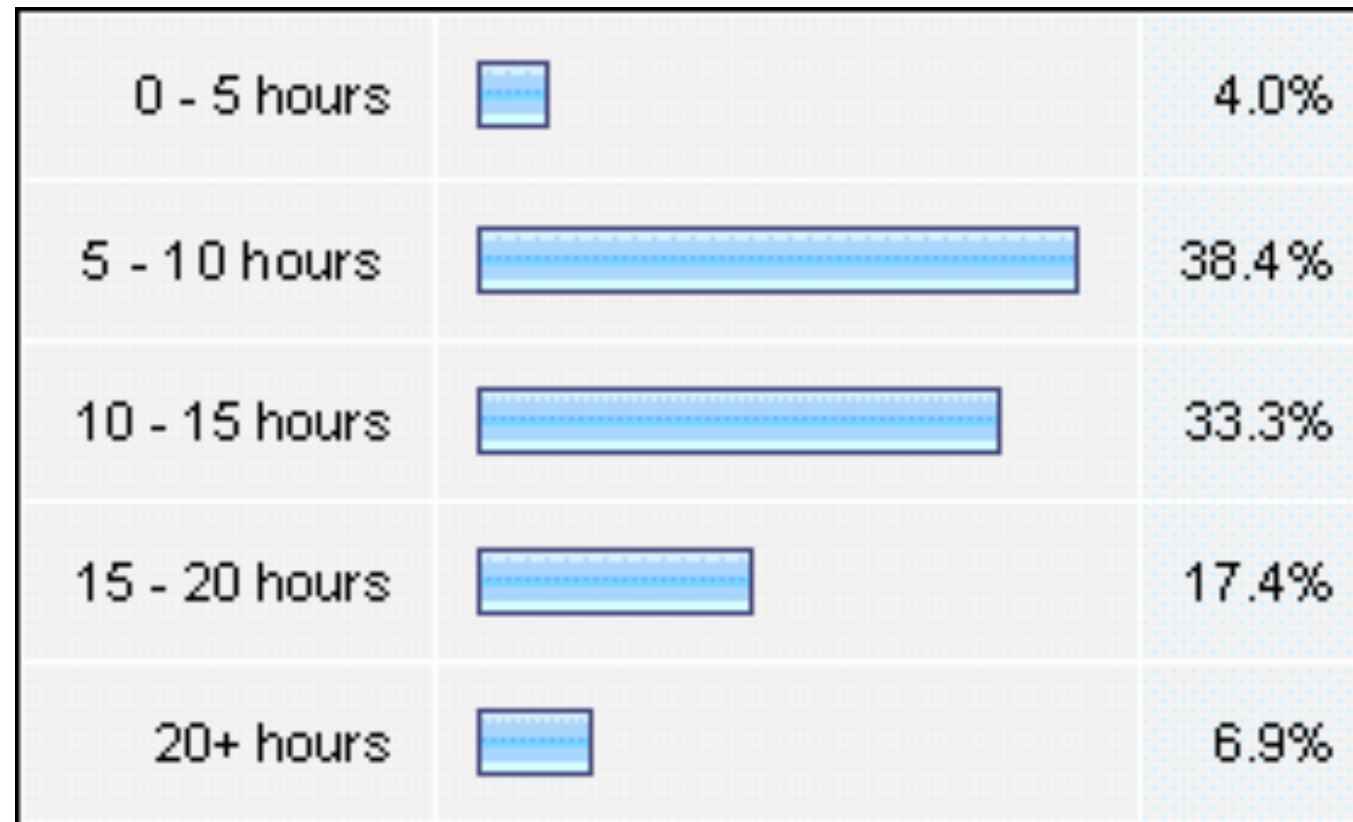




# Expectations

- ▶ Attend all lectures and sections.
- ▶ Complete nine problem sets.
- ▶ Take two quizzes.
- ▶ Produce a final project.

# Workload



# Resources

- ▶ Lectures (+ Videos)
- ▶ Sections (+ Videos)
- ▶ Walkthroughs (+ Videos)
- ▶ Office Hours (+ Virtual)
- ▶ Website (PDFs)
- ▶ Scribe Notes
- ▶ Bulletin Board (Anonymized)
- ▶ [help@cs50.net](mailto:help@cs50.net)
- ▶ ...

# hello, C?

```
#include <stdio.h>
```

```
int
```

```
main(int argc, char *argv[])
```

```
{
```

```
    printf("hello, world\n");
```

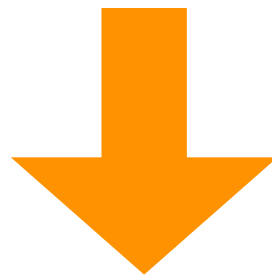
```
}
```

# hello, Scratch!





# Scratch Meets C

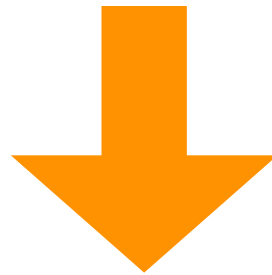


```
int
main(int argc, char *argv[])
{
    printf("hello, world\n");
}
```



# Statements

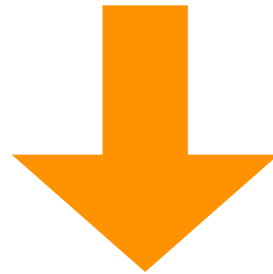
## Scratch v. C



```
printf("hello, world\n");
```

# Boolean Expressions

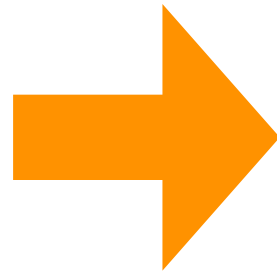
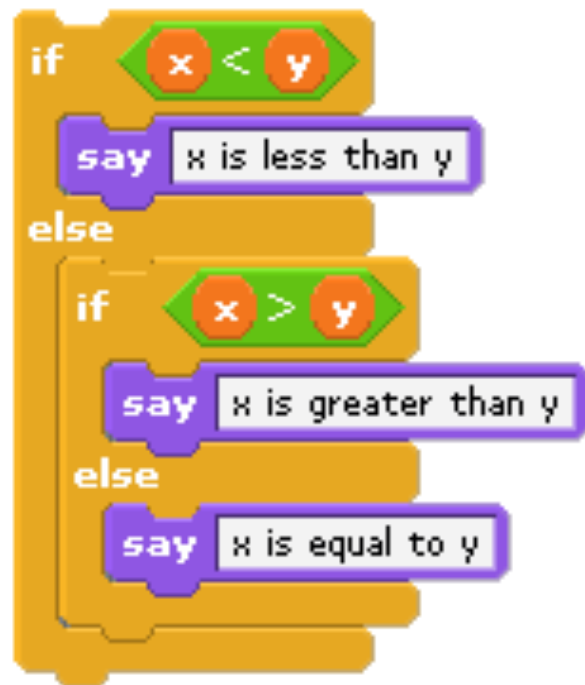
Scratch v. C



$(x < y)$   
 $((x < y) \ \&\& \ (y < z))$

# Conditions

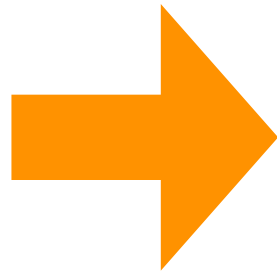
## Scratch v. C



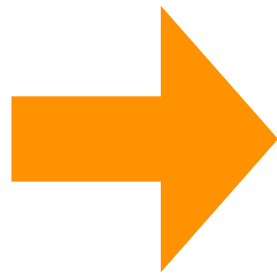
```
if (x < y)
{
    printf("x is less than y\n");
}
else if (x > y)
{
    printf("x is greater than y\n");
}
else
{
    printf("x is equal to y\n");
}
```

# Loops

## Scratch v. C



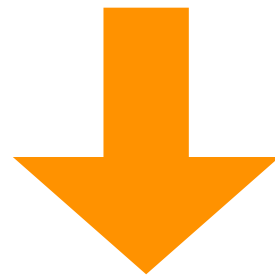
```
while (1)
{
    printf("Hello!\n");
}
```



```
for (int i = 0; i < 10; i++)
{
    printf("Hello!\n");
}
```

# Variables

## Scratch v. C

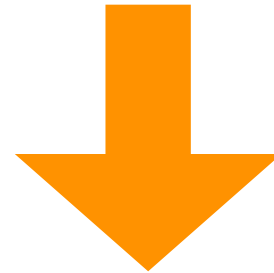


```
int counter = 0;
while (1)
{
    printf("%d\n", counter);
    counter++;
}
```



# Arrays

## Scratch v. C



```
char *inventory[SIZE];  
inventory[i] = "Orange";
```



# Lectures

## Week 0

Introduction. Bits. Binary. ASCII.  
Programming. Algorithms. Scratch.  
Statements. Boolean expressions. Conditions.  
Loops. Variables. Threads. Events.



# Lectures

## Week 1

C. Source code. Compilers. Object code. SSH. SFTP. GCC. Functions. Comments. Standard output. Arithmetic operators. Precedence. Associativity. Local variables. Types. Casting. Standard input. Libraries. Boolean expressions, continued. Conditions, continued. Loops, continued.

```
#include <stdio.h>

int
main(int argc, char *argv[])
{
    printf("hello, world\n");
}
```

# Lectures

## Week 2

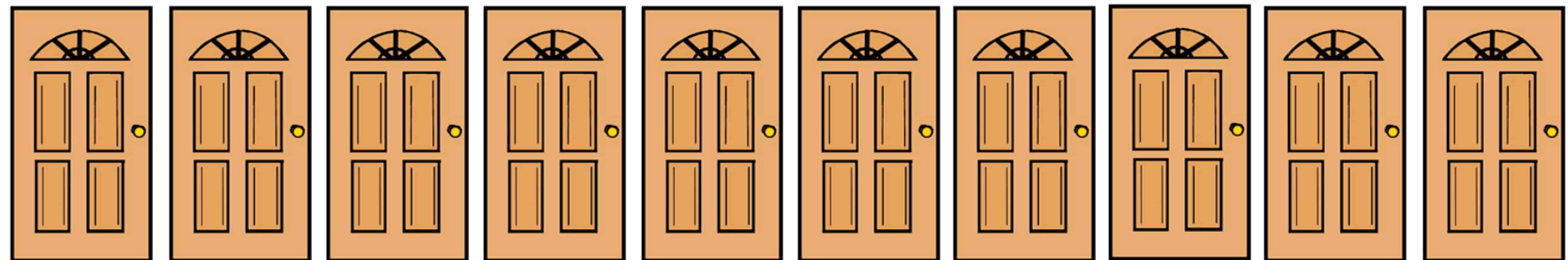
Functions, continued. Global variables. Parameters. Return Values. Stack. Frames. Scope. Arrays. Strings. Command-line arguments. Cryptography.



# Lectures

## Week 3

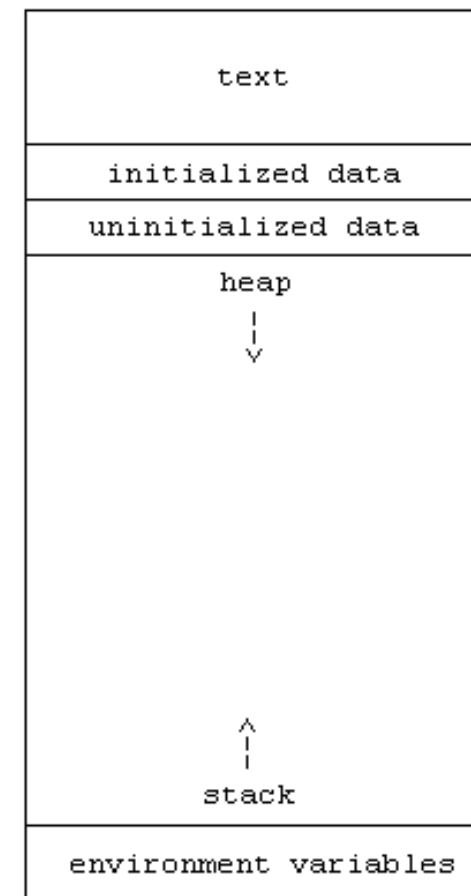
Linear search. Binary search. Asymptotic notation. Recursion. Pseudorandomness. Bubble sort. Selection sort. Insertion sort. Merge sort. Debugging.





# Week 4

Structures. Dynamic memory allocation. Stack and heap. Pointers. Debugging, continued.



# Lectures

## Week 5

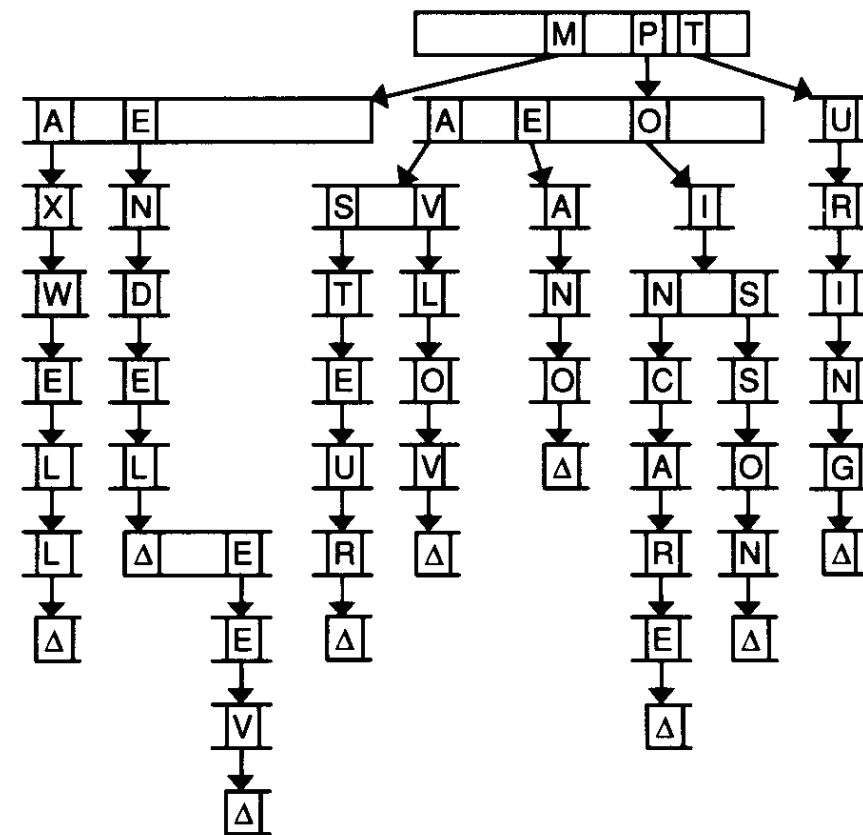
File I/O. Forensics. Linked lists. Stacks.  
Queues.





# Week 7

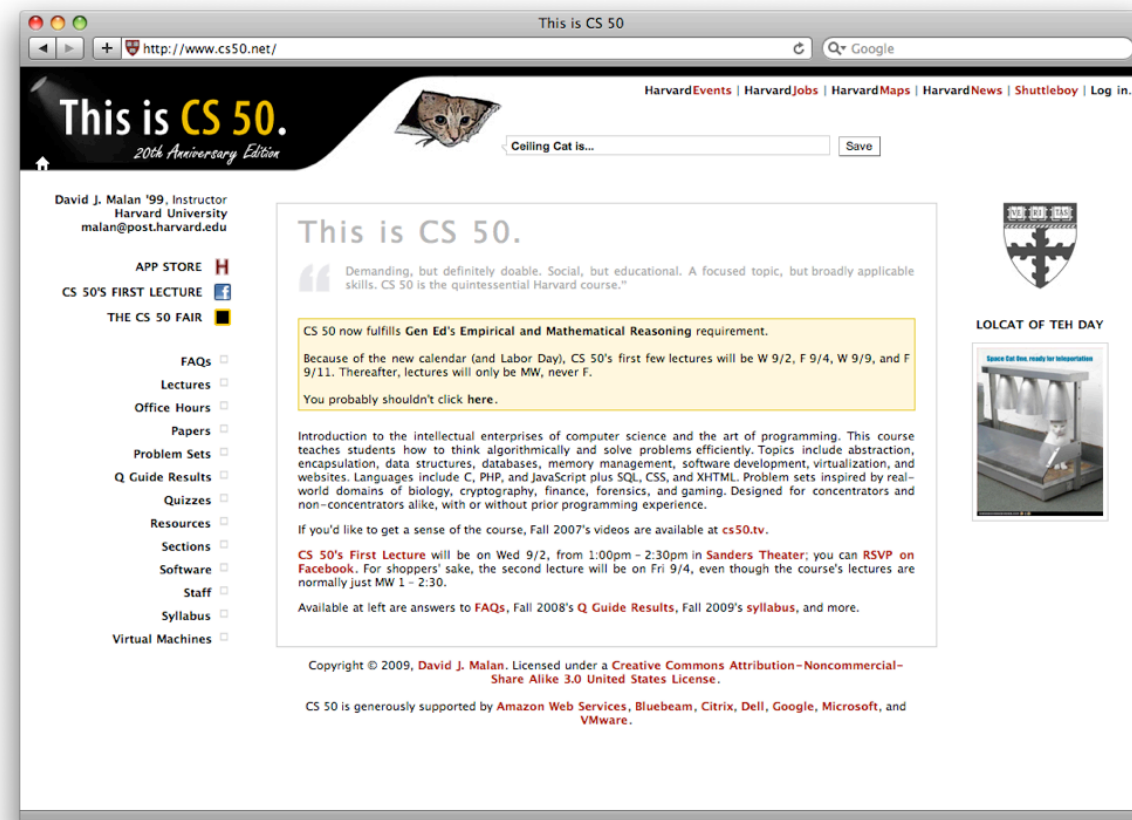
Valgrind. Bitwise operators. Hash tables.  
Trees. Binary search trees. Tries. Heaps.  
Heapsort. Huffman coding.



# Lectures

## Week 8

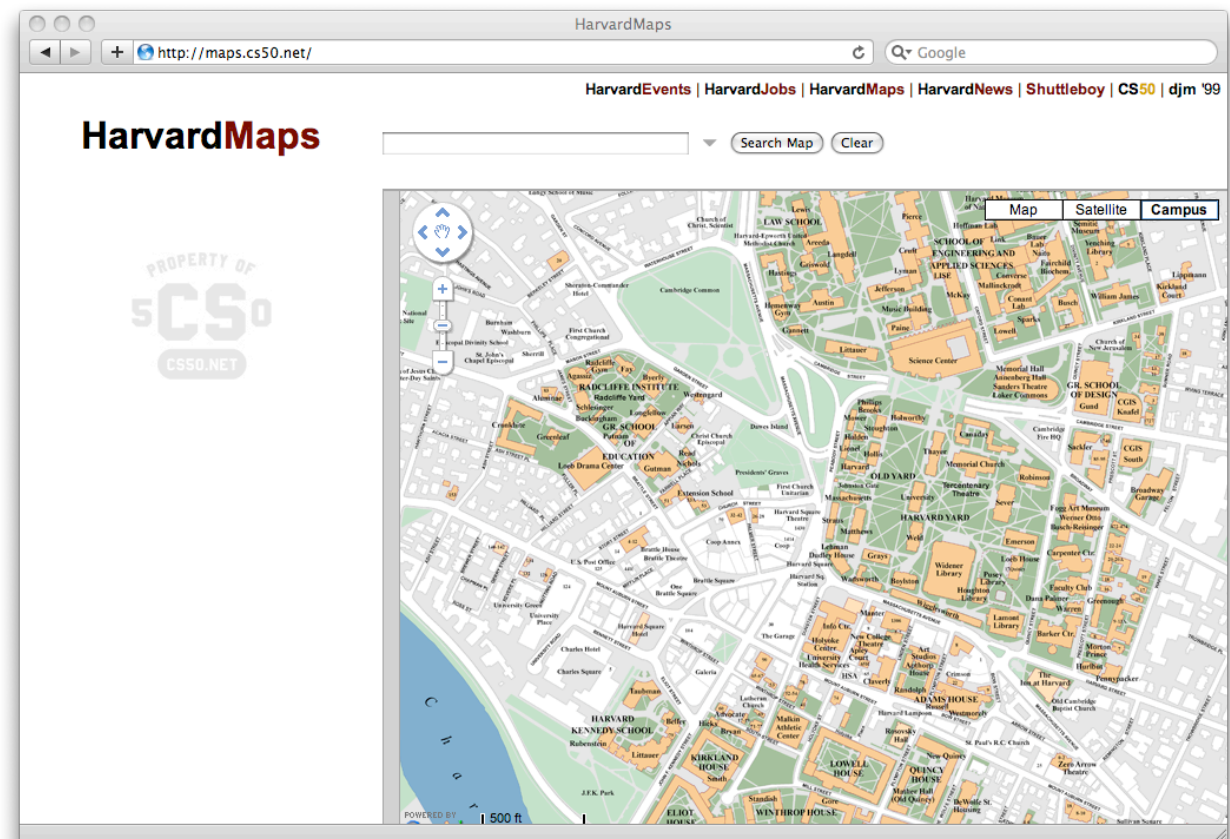
TCP/IP. HTTP. XHTML. PHP. SQL.



# Lectures

## Week 9

DOM. CSS. Inheritance. JavaScript. Events, continued. OOP. Ajax.





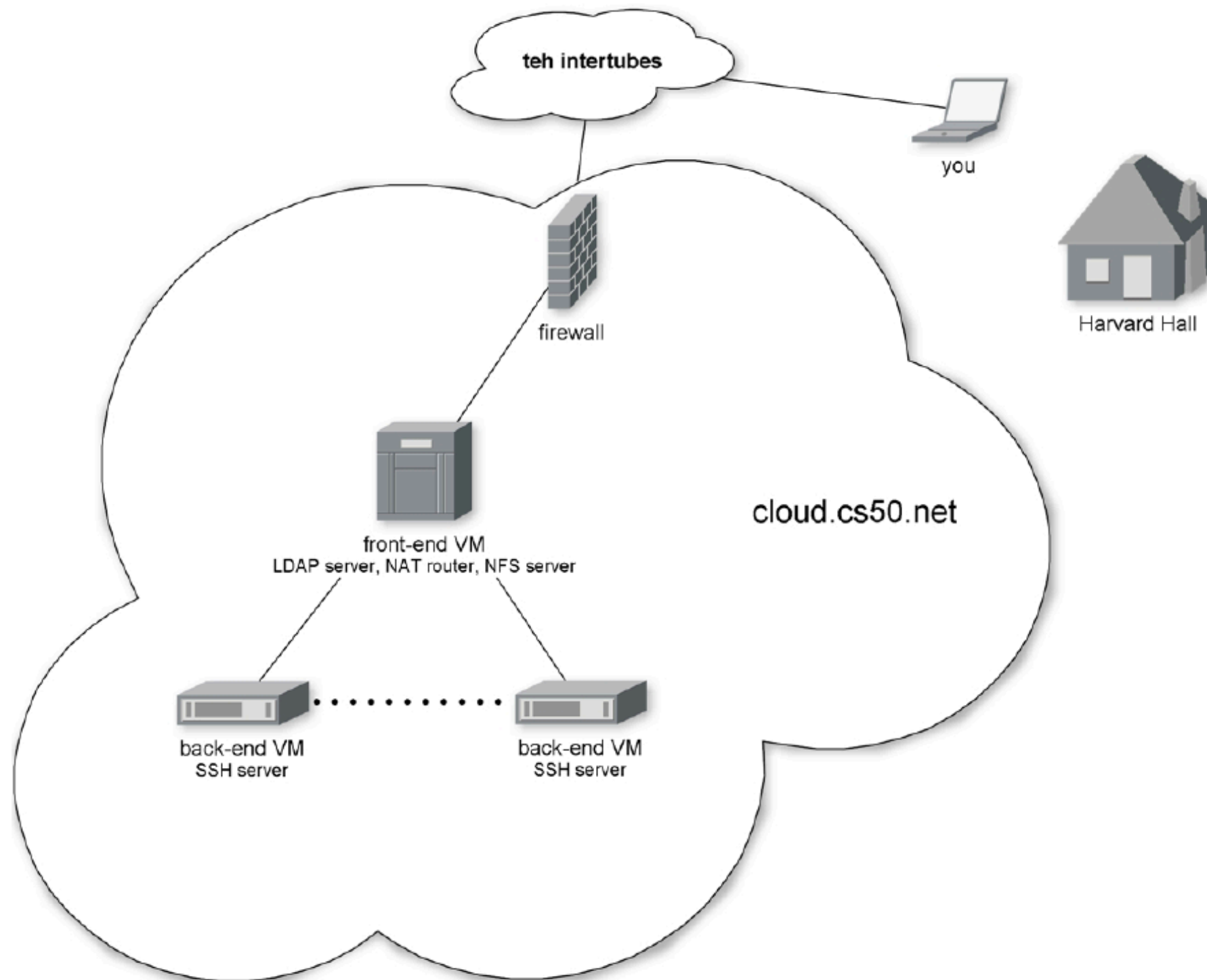
# Lectures

## Week 10

Preprocessing. Compiling. Assembling.  
Linking. CPUs.



# CS 50 in the Cloud



# CS 50 in a Box



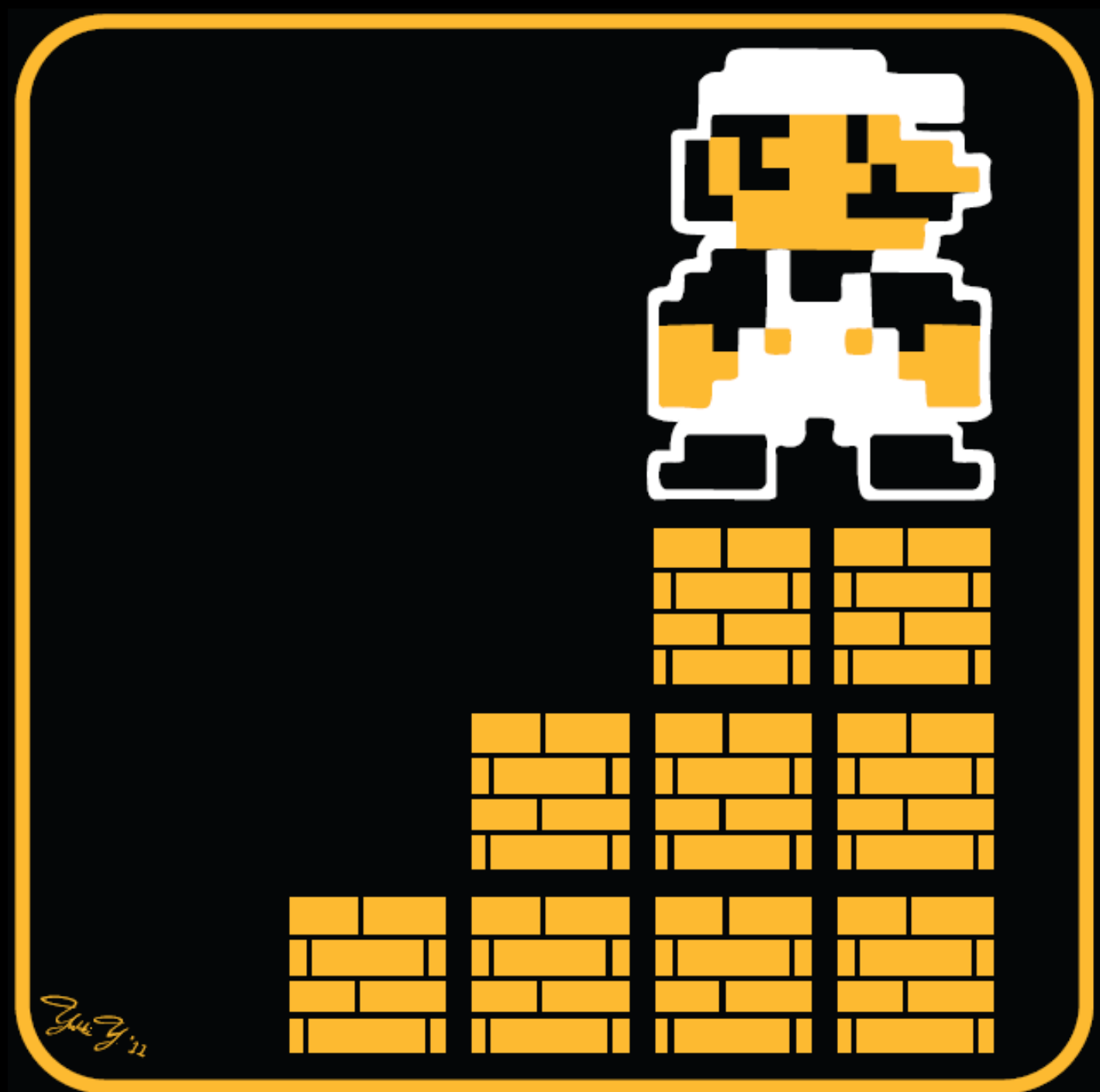




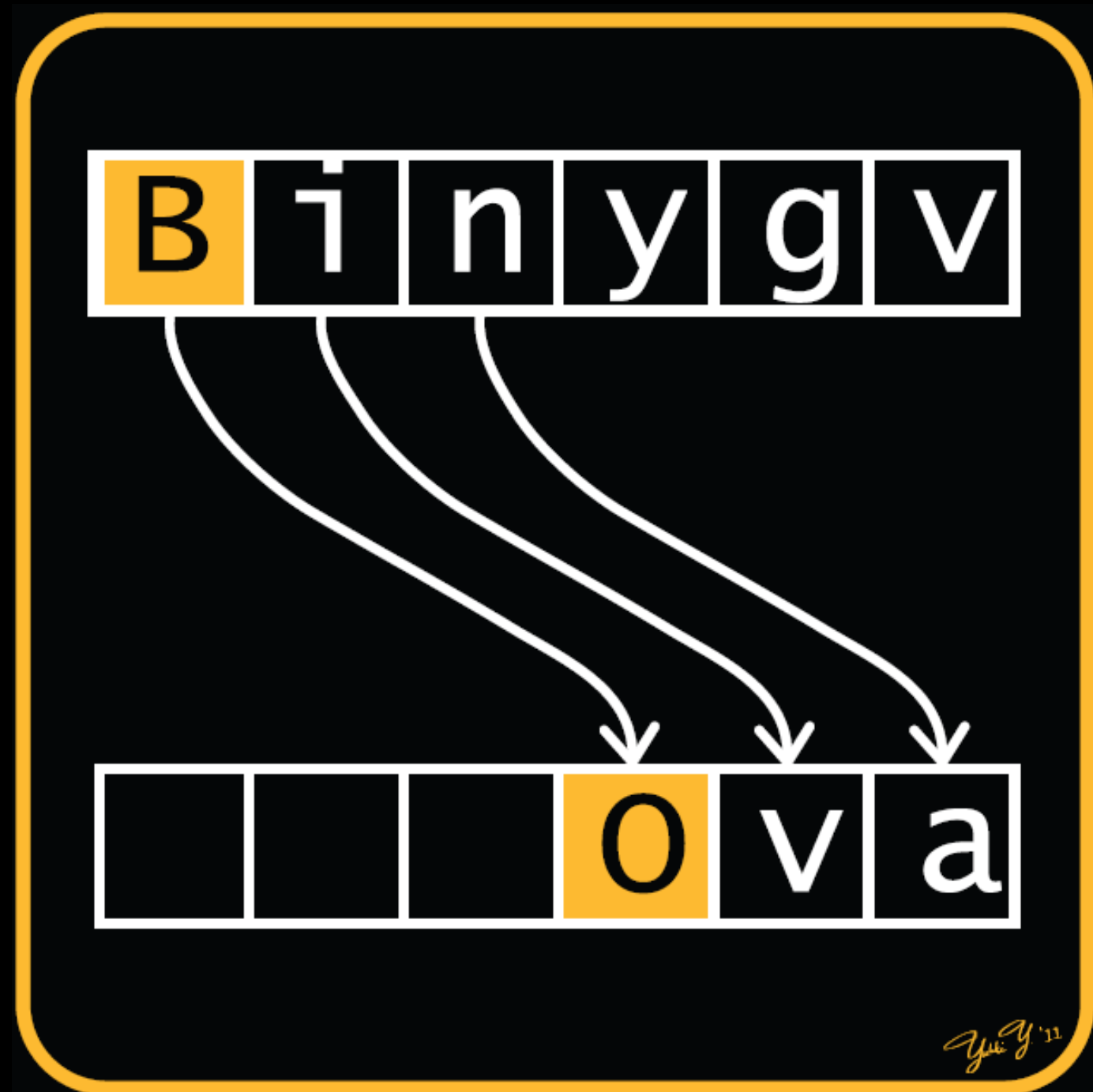
O, hai!

Yui Y. '11

0: Scratch



1:C



2: Crypto



### 3: Game of Fifteen

# 数独

8			4		6			7
						4		
	1					6	5	
5		9		3		7	8	
				7				
	4	8		2		1		3
	5	2					9	
		1						
3			9		2			5

2022.9.12

## 4: Sudoku





## 5: Forensics



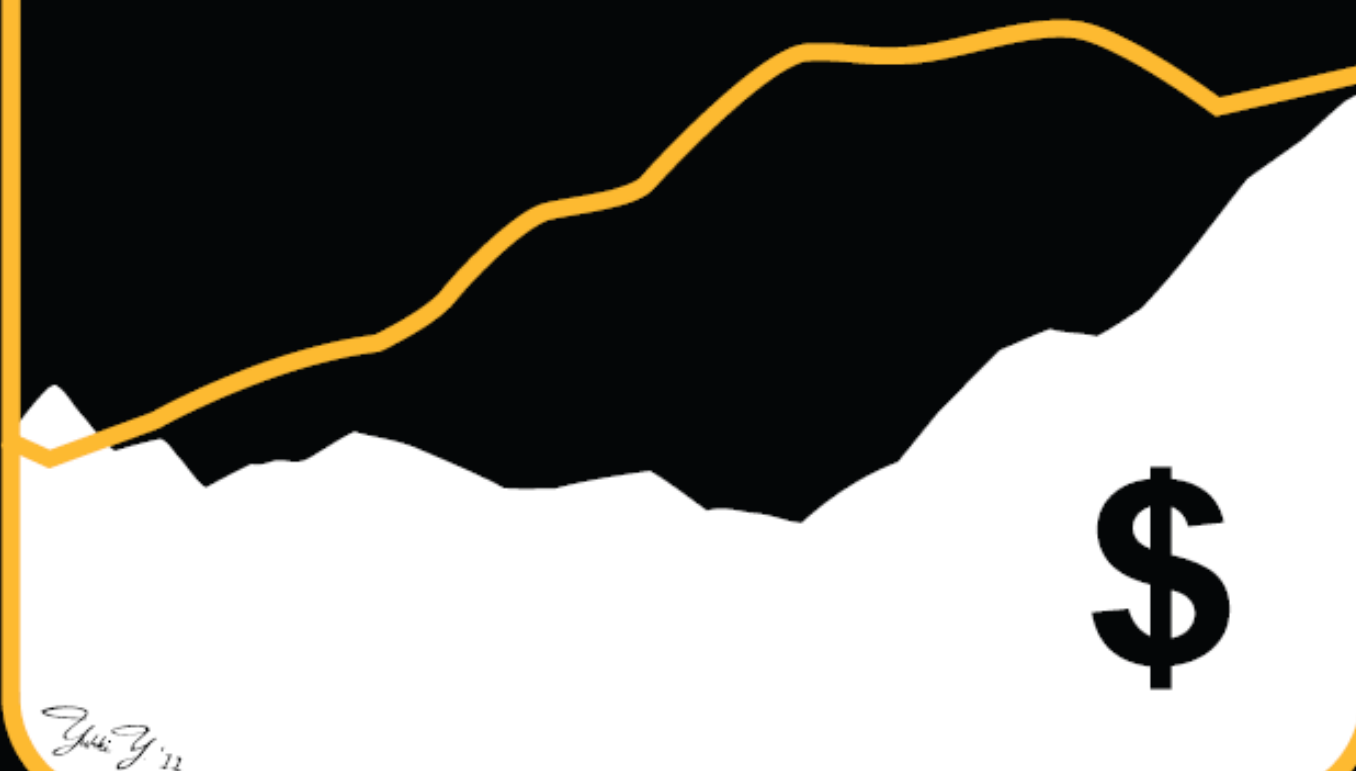
Teh Computer Sci-  
ence 50 learnz you  
about intertubes in  
teh cloudz. David J.  
Malan will pwn u  
ftw so watch out!

*ayy*

## 6: Misspellings

**CS50**

↑ **120**



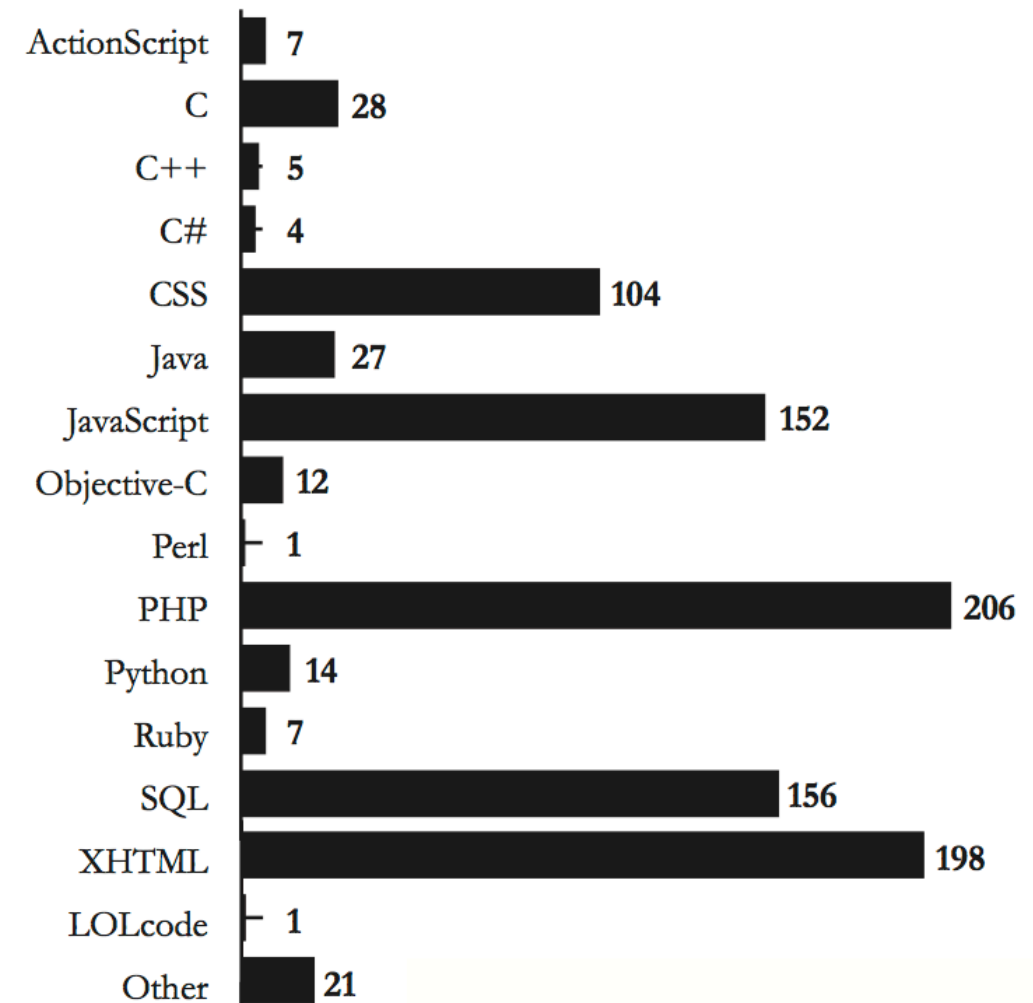
**7: C\$50 Finance**





## 8: Mashup

# The CS 50 Fair



This is CS 50.