

CSCI E-50 WEEK 2

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TODAY

— — —

- Introductions
- Resources Review
- Debugging
- Arrays
- Functions and variable scope
- Command-line arguments
- Problem Set 2 Preview

ABOUT ME

— — —

HBSc PSYCHOLOGY & HUMAN BIOLOGY, U OF TORONTO (2009)

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Sections: Tuesdays 7–9 pm EST

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ABOUT YOU

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Share:

- YOUR NAME
- WHERE YOU LIVE
- WHY YOU CHOSE CS50
- PREVIOUS CS EXPERIENCE?

MY JOB AS A TF

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- SECTIONS
- OFFICE HOURS
- E-MAILS
- GRADING

WHAT TO EXPECT FROM SECTION

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- Review of core concepts
- Hands-on practice problems and activities
- Pset questions
- Q & A
- Anything and everything in between

GROUND RULES

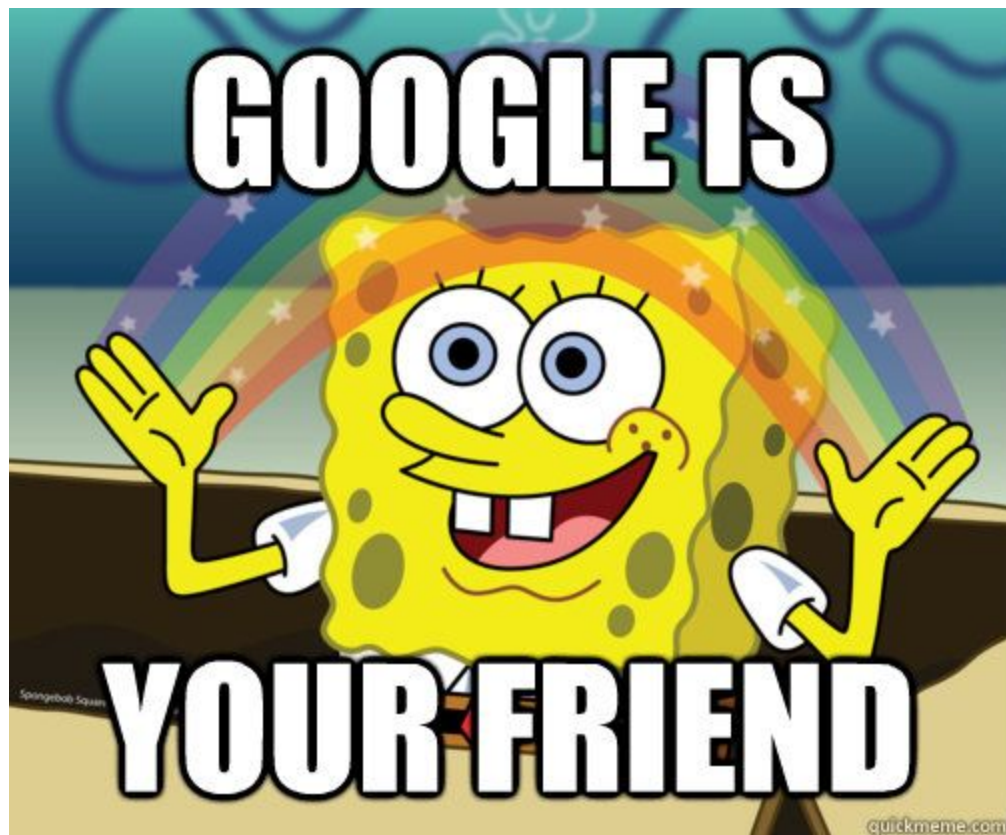
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- Come prepared
 - Watch lectures
 - Read pset specification
 - Prepare questions
- Share feedback
- Have fun!

RESOURCES

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- Lecture videos
- Walkthroughs
- Scribe notes
- Office hours
- [Shorts](#)
- [Reference50](#)
- [CS50 Discourse](#)
- [Style Guide](#)



QUESTIONS?

DEBUGGING

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- `eprintf`
- `debug50`
- `help50`



eprintf

- `eprintf` with context.
- Tells you exactly what line of code in their program triggered the `eprintf` call as well.
- Example 1

debug50

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- The graphical debugger for chasing down bugs in code.
- You can:
 - step into
 - step over
 - display variables' values
 - change variables' values
- Example 2

help50

— — —

- can prepend calls to, e.g., `make` or `clang` to help explain the sometimes confusing error messages that can result.
- Example 3

ARRAY

To initialize an array

```
int score[0] = 0; // zero index all  
arrays!
```

```
int score[1] = 1;
```

```
int score[2] = 2;
```

or

```
int score[] = {0, 1, 2}; // size  
based on the number of entries
```

// make an array

```
<datatype> <name>[<size>;
```

```
char alpha[26];
```

```
Int score[5];
```

// iterate over the array's members

Let's Look at Examples

— — —

Example 4

Example 5

STRING

Just an array of characters!

Final index of a string in C is the null terminator `'\0'`, which tells a string that the string is over.



```
// declare string
```

```
String s = "teresa";
```

```
// what happens when I index into  
s[i]?
```

```
Printf("%c\n", s[0]);
```

```
Printf("%c\n", s[1]);
```

```
Printf("%c\n", s[6]);
```

```
Printf("%c\n", s[7]);
```



FUNCTIONS

— — —

(1) take something in [parameters],

(2) do something [body], and
finally

(3) spit out an answer [return
value].



Why use a function?

- Simplification
- Organization
- Reusability

Creating a function

1. Declaration
2. Definition
3. Function calls

```
<return-type> <name>(<parameter-list>);
```

Let's Look at Examples

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- `int main(void)`
- Example 6

SCOPE

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Scope is a characteristic of a variable that defines from which functions that variable may be accessed.

- Local variables: can only be accessed within the functions in which they are created { }.
- Global variables: can be accessed by any function in the program.

Example 7

COMMAND LINE ARGUMENT

Allows you to pass arguments into the main function of the program by specifying the arguments at the command line.

Benefit? Offers an alternative means of providing input to a program beyond just requesting input while program is running.

argc - argument count

argv - argument vector(array of chars or string)

```
int main(void)
```

Becomes...

```
int main(int <argc>, string <argv>)
```

```
//this lets the program know that it  
needs to expect and process command line  
parameters.
```

Where have you already seen them?

argc

— — —

command	argc
./greedy	1
./greedy 10 cs50	3
./cube 3 5 7	4

argv

command: ./greedy 10 cs50

argv indices	argv contents
Printf ("%s\n", argv[0])	greedy
argv[1]	10
argv[2]	cs50
argv[3]	

Let's Look at Examples

— — —

Example 8

pset2

— — —

1. Choose two adventures:

- Implement Caesar's cipher (less comfy)
- Implement Vigenère's cipher (less comfy)
- Crack passwords (more comfy)

Final words on pset2

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- Remember they need to preserve case!
- All command line arguments are strings. How might they convert "1" in the above example to an int?
- `<ctype.h>`
- Be careful about rotating too far
- Vigenere is similar to Caesar, except in place of an int, a second string is used to encrypt the target word.
 - For example, entering "Doug Lloyd" and "hi" will output "Kwbo Stvgk".
- Pseudocode
- Don't forget to comment!