This is Halloween Week ~~8~~

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Hi!

Welcome to my home page!

Feel free to browse around!

This is a picture of two dolphins. Dolphins are my favorite animals.

(Btw, that word "dolphin" up there. Ya, it's a hyperlink. Nbd.)

Wait a second . . . here's one more link. Baby monkey!

Agenda

- Announcements
- HTML
  - Tags
  - mypage.html
  - Resources
- chmod
- CSS
  - mypage1.html
  - mypage2.html + mycss.css
  - mypage3.html
- PHP
- SQL

Announcements

- Problem Set 7 Walkthrough (Sun, 7pm, NW B103) – https://www.cs50.net/psets/
- Problem Set 5's Scavenger Hunt
  - :(
- Problem Set 6's BIG BOARD
  - I Saw You…Adabelle, Irineo, Holly, Stephen, Jimmy, Larmon, Marc + Quan
- Final Project
  - Pre-Proposal due by noon on Mon 11/7
  - Looking for a project? https://projects.cs50.net
  - Want to learn something new? https://manual.cs50.net/Seminars

HTML

HTML

- HyperText Markup Language
- NOT a programming language
  - Describes content but does not create content
  - No if conditions or for/while loops

Main Purposes

- Content, structure and format
  - How should my content look?
  - Where should it all go?
- Metadata
  - Information about the web page

HTML

- A series of embedded elements
  - I.e. “things”
- But “thing” isn’t that descriptive…
- …so each element has tags that tell the browser exactly what to do with it
- In human-speak

```
start tag:
make things bold
```

```
I'm as brave as a lion!
```

```
end tag:
stop making
things bold
```

- In HTML

```
<b> I'm as brave as a lion! </b>
```

Tags

- Many tags contain attributes, which modify or give specificity to a tag
  - E.g. I have a hyperlink but to where?
- Attributes are specified in key-value pairs

key value

```
<a href="https://www.cs50.net">CS50 Home</a>
```

- Remember to always close your tags!

Structure

- A valid HTML document also has a particular structure
- `<!DOCTYPE html>`
  - Tells the browser what type of document this file is
  - Simply a declaration at the beginning of the file
- `<html>`
  - Tells the browser that everything inside is HTML
- `<head>`
  - Tells the browser what to load before the user can interact with the page
- `<body>`
  - Tells the browser that everything inside is the actual content of the page

HTML

- To view your web page from a browser, it must be in a directory called `public_html`
  - You'll create one in pset7
- Remember to make sure your HTML is valid!
  - http://validator.w3.org/
- Feel free to check out my home page…
  - https://cloud.cs50.net/~jhirschh/

Resources

- There's so much I can/want to do! Where do I look for help?
- Google
  - https://www.google.com/
- w3schools
  - http://www.w3schools.com/
  - "Try it Yourself Editor"
- cs50.net Resources
  - https://www.cs50.net/resources/
- Week 8 Cheatsheets
  - https://www.cs50.net/lectures/

chmod

chmod

- "Change mode"
  - Control the permissions for files and directories
- Who can access?
  - You (i.e. user)
  - Everyone else (i.e. group + others)
- How much can someone access?
  - r – read a file or list a directory's contents
  - w – write to a file or directory
  - x – execute a file or move into a directory
- Why are permissions important?

chmod

- Make a directory

```
mkdir ~/public_html
```

- Change the directory's permissions

```
chmod a+x ~/public_html
```

- Alternatively

```
chmod 711 ~/public_html
```

user			group			others		
r	w	x	-	-	x	-	-	x
1	1	1	0	0	1	0	0	1
7			1			1		

chmod

- For index.html (or any HTML page we create)
  - The user should be able to read and write
  - The rest of the world should be able to read

Quick Quiz

```
chmod ??? index.html
```

- What are the questions marks if…
  - …using “shorthand”?
  - …using an octal combination?

CSS

CSS

- Cascading Style Sheets
  - HTML defines our content and structure
  - CSS defines its style
- Give certain style properties to a specific element or group of elements
  - For a specific element, give it an `id`
  - For a group of elements, give them all a `class`

```
<img src="logo.gif” id="logo" class="top">

<h1 class="top">My Page Title</h1>
```

Styling a Page

1. Use the `style` attribute

```
<p style="text-align: center;">
```

2. Create an external stylesheet and link it in
   - In the head of the HTML file

```
<link rel="stylesheet" type="text/css"
href="style.css">
```

   - In the CSS file

```
p { text-align: center; }
```

3. Use an internal stylesheet
   - In the head of the HTML file

```
<style> p { text-align: center; } </style>
```

PHP

PHP

- PHP Hypertext Preprocessor
- Dynamically generates a web page
  - A “backend” for your web page
  - Code is executed by the server not the browser
  - Plays nicely with HTML
- All PHP code (if in an HTML file) must be inside the `<?php ?>` tag
- It’s really similar to C…
  - `if (condition) {} else if (condition) {} else {}`
  - `while (condition) {}`
  - `for (<pre>; <condition>; <post>) {}`

PHP

- …for the most part

Variables

- Don't have types, and you can mix data types
  - Loosely-typed (PHP) vs. strongly-typed (C)
- Must start with the dollar sign
  - `$x = 42;`
  - `$s = "cs50";`

Compilation

- All PHP code on a page is interpreted line by line by the server then the result is displayed to the user
  - Interpreted (PHP) vs. compiled (C)

PHP

- A browser “requests” a web page in two ways

GET

- Information is displayed in the URL
- For information that is not too sensitive
- E.g. a page on YouTube

http://www.youtube.com/watch?v=GI6CfKcMhjY

POST

- Information is not displayed in the URL
- Marginally more private
- E.g. whether you are/are not logged into cs50.net, the URL is the same

https://www.cs50.net/

PHP

- Whether it's a GET or POST request, PHP can access the information
  - `$_GET`
  - `$_POST`
- Built-in arrays that store key-value pairs
  - (Like hash tables from last week)
- E.g.
  - If a user accesses this URL

    http://www.youtube.com/watch?v=GI6CfKcMhjY
  - In watch.php referencing `$_GET("v")` returns `GI6CfKcMhjY`
  - So we could look up `$_GET("v")` in the database where we store all the videos and then display the right video

PHP

- If a user submits a form, variables are stored as key-value pairs in arrays

where variables should be sent

```
<form action="register.php" method="post">
   <table>
       <tr>
           <td>Captain:</td>
           <td><input name="captain" type ="checkbox"></td>
       </tr>
   </table>
   <input type="submit" value="Register!">
</form>
```

what type of request (get or post)

name attribute is the key; user input is value

SQL

SQL

- Structure Query Language
- Allows you to interact with a database
  - Insert new values
  - Retrieve values meeting certain parameters
  - Delete or update old values
- Tightly integrated with PHP

Database

- Database = collection of tables
- Table = many records of the same type
- Record = single instance of a type that fills a number of fields

fields

records

id	username	password

SQL Queries

- Insert a new row

```
INSERT INTO <table>(<column 1>, <column 2>)
VALUES (<value1>, <value 2>)

INSERT INTO users(id, username, password)
VALUES (1, 'djm', 'bowden')
```

- Delete a row

```
DELETE FROM <table> WHERE <column> = <value>

DELETE FROM users WHERE username = 'djm'
```

SQL Queries

- Retrieve a row

```
SELECT <column> FROM <table> WHERE <other column> = <value>
```

```
SELECT username FROM users WHERE id = 1
```

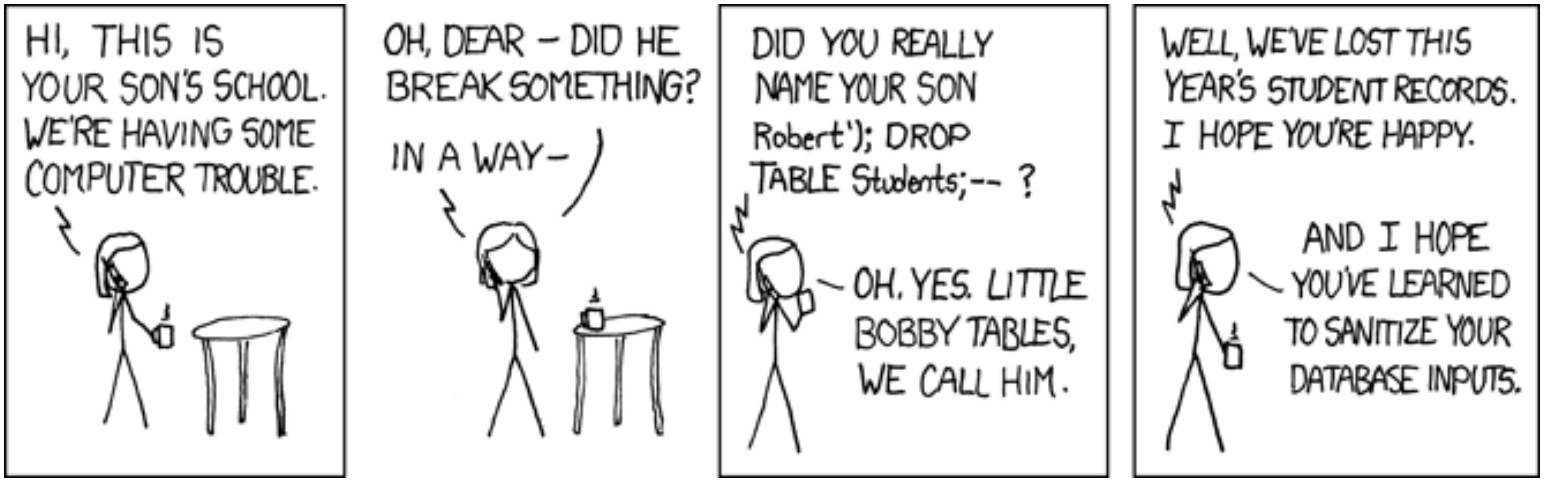
- Modify an existing row

```
UPDATE <table> SET <column> = <value> WHERE <other column> = <value>
```

```
UPDATE users SET password = 'chartier' WHERE username = 'djm'
```

SQL

- These queries are just examples
  - There are many more keywords you can add to your queries!
- In pset7, you get to create your own database
  - phpMyAdmin, a web-based tool with which you can manage MySQL databases
- As we've discussed, it is *essential* to "escape" the contents of any string given by the user before you put it in a database


HI, THIS IS YOUR SON'S SCHOOL. WE'RE HAVING SOME COMPUTER TROUBLE.
OH, DEAR – DID HE BREAK SOMETHING?
IN A WAY–
DID YOU REALLY NAME YOUR SON Robert'); DROP TABLE Students;-- ?
OH. YES. LITTLE BOBBY TABLES, WE CALL HIM.
WELL, WE'VE LOST THIS YEAR'S STUDENT RECORDS. I HOPE YOU'RE HAPPY.
AND I HOPE YOU'VE LEARNED TO SANITIZE YOUR DATABASE INPUTS.

That was Week 8

http://xkcd.com/627/