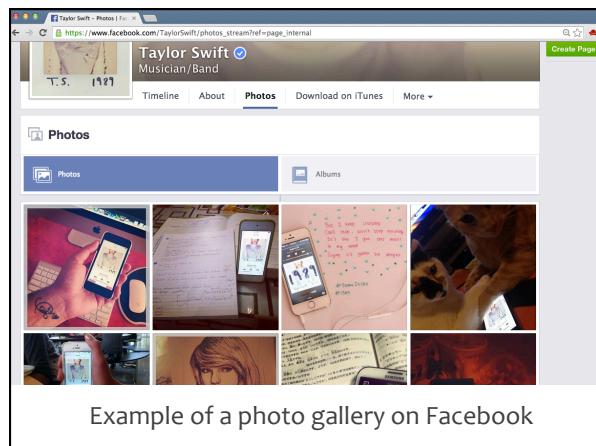


How many of you use Facebook?

How many of you have uploaded photos  
on Facebook?



## Today's Plan

- How to build a photo gallery like the Facebook one?
- How to make it “responsive” to different platforms (laptop, tablet, phone, etc.)

## The Start: Photo Collection

Name	Date Modified	Size	Kind
2014-08-16 18.24.23.jpg	Aug 16, 2014 6:24 PM	1.6 MB	JPEG image
2014-08-16 18.22.21.jpg	Aug 16, 2014 6:22 PM	3.3 MB	JPEG image
2014-08-15 09.14.24.jpg	Aug 15, 2014 9:14 AM	4 MB	JPEG image
2014-07-26 09.46.30.jpg	Jul 26, 2014 9:46 AM	3.6 MB	JPEG image
2014-07-26 09.01.28.jpg	Jul 26, 2014 9:01 AM	3.9 MB	JPEG image
2014-07-26 09.01.11.jpg	Jul 26, 2014 9:01 AM	4 MB	JPEG image
2014-07-25 10.36.02.jpg	Jul 25, 2014 10:36 AM	3.2 MB	JPEG image
2014-07-23 09.11.24.jpg	Jul 23, 2014 9:11 AM	4.9 MB	JPEG image

## HTML Page

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="utf-8">
    <title>Photos from Lake Waban</title>
</head>

<body>
    <h1>Lake Waban - Photo Gallery</h1>
</body>
</html>
```

## How to add an image to this page?

```
<body>
    <h1>Lake Waban - Photo Gallery</h1>
    
</body>
```

Houston, we have a problem ...

Lake Waban - Photo Gallery



Fix with the attribute

```

```

Lake Waban - Photo Gallery



Add the second photo

```


```

Lake Waban - Photo Gallery



Add all photos

```
<body>
  <h1>Lake Waban - Photo Gallery</h1>
  
  
  
  
  
  
  
  
</body>
```

**Lake Waban - Photo Gallery**

Why is it taking so long for the images to show up in the page?

**Measure Internet Speed**

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

**Calculate Download time**

**Given:**

- 8 files with total amount:  
 $1.6 + 3.3 + 4 + 3.6 + 3.9 + 4 + 3.2 + 4.9 = 24.5 \text{ MB}$
- Download speed: **5Mbps** (Mega bit per second)

**Known:**

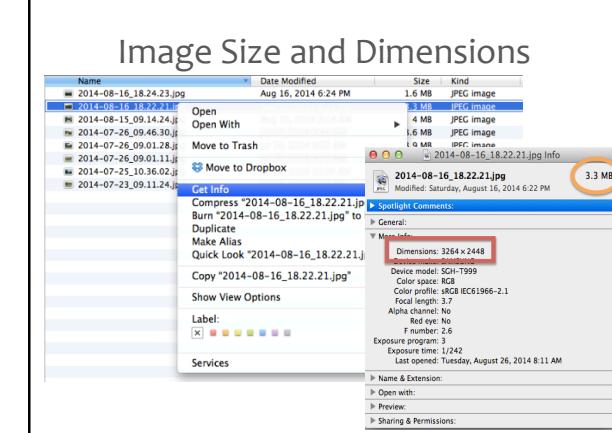
$1 \text{ B} = 8 \text{ b}$  (1 Byte = 8 bits)

$\text{Time} = \frac{\text{TotalAmount}}{\text{Speed}}$   
 $\text{Time} = \frac{24.5 \text{ MB} * 8 \text{ bits}}{5 \text{ MBps}} = 39.2 \text{ seconds}$

Image: <http://wkrn.images.worldnow.com/>

## Your Turn

- Assume we have 40 images taken with the same camera and the download speed is 10Mbps.
- Estimate** how long it will take for all images to appear on the page.



## Learned Lesson Nr. 1

- Never use images straight from your camera. First reduce their size to go from a few MB (mega bytes) to only several KB (kilo bytes)
- There are free web services that do the resizing of many images at once, for example:  
<http://www.picresize.com/batch.php>.

## Resizing / Compression

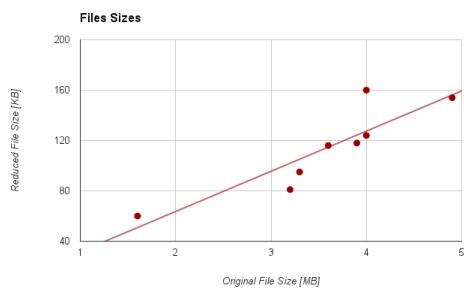
From 3264 x 2448 (pixels) we'll go to:  
816 x 612 (pixels) [area reduction by 16 times]

Name	Size	Name	Size
2014-08-16_18.24.23.jpg	1.6 MB	2014-08-16_18.24.23_new.jpg	60 KB
2014-08-16_18.22.21.jpg	3.3 MB	2014-08-16_18.22.21_new.jpg	95 KB
2014-08-15_09.14.24.jpg	4 MB	2014-08-15_09.14.24_new.jpg	160 KB
2014-07-26_09.46.30.jpg	3.6 MB	2014-07-26_09.46.30_new.jpg	116 KB
2014-07-26_09.01.28.jpg	3.9 MB	2014-07-26_09.01.28_new.jpg	118 KB
2014-07-26_09.01.11.jpg	4 MB	2014-07-26_09.01.11_new.jpg	124 KB
2014-07-25_10.36.02.jpg	3.2 MB	2014-07-25_10.36.02_new.jpg	81 KB
2014-07-23_09.11.24.jpg	4.9 MB	2014-07-23_09.11.24_new.jpg	154 KB

Original Images

Resized Images

## Compression is not linear



## The two Images



We'll discuss JPEG compression of images later in the semester.

## Today's Plan

- How to build a photo gallery like the Facebook one? ✓
- How to make it “responsive” to different platforms (laptop, tablet, phone, etc.)

## Enter CSS

CSS is the style language

- Step 1:** Write the CSS rules in a separate file.  
**Step 2:** Link to this file from the HTML code.

**Step 1:** Write CSS rules in a separate file.

```

1 /*
2 Filename: pgstyle.css
3 Purpose: Style the photo gallery
4 */
5
6 img {
7   width: 280px;
8 }

```

```

1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <meta charset="utf-8">           Step 2: Link to CSS file
5   <title>Photos from Lake Waban</title>
6   <link rel="stylesheet" href="pgstyle.css">
7 </head>
8
9 <body>
10  <h1>Lake Waban - Photo Gallery</h1>

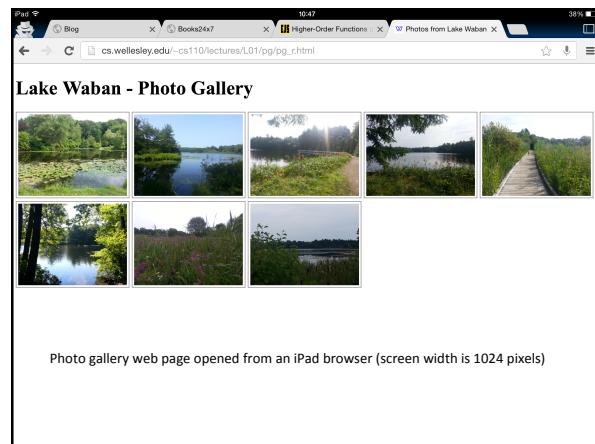
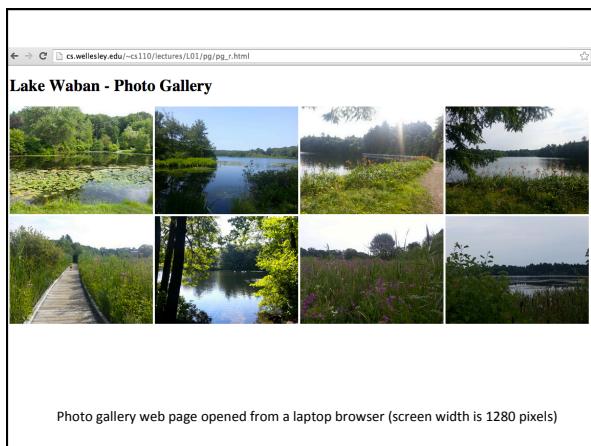
```

## Add a new CSS Rule

```

1 /*
2 Filename: pgstyle.css
3 Purpose: Style the photo gallery
4 */
5
6 img {
7   width: 280px;
8 }
9
10 /* this rule will apply to iPads */
11 @media screen and (max-width : 1024px) {
12   img {
13     width: 180px;
14     padding: 3px;
15     border: 1px solid gray;
16   }
17 }

```



## Puzzle

Our HTML code is not valid. What have we forgotten to specify?

## What did we learn?

- Imperative Knowledge
  - How to create a web page for a photo gallery
  - How to discover your internet speed
  - How to resize images
- Declarative knowledge
  - The tag <img> is used to incorporate images in HTML
  - Images need to be resized to reduce download time
  - The CSS language can be used to change the appearance of web pages