ECS 89

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3/31

Beginning Web Programming

- Or maybe Web Programming for Beginners
- Alternative to ECS 30
- More on handling data and putting it on the Web
  - Improve your programming skills
  - Learn a bit about a variety of current Web technologies

Goal

- Get to the point where you can build a simple application that runs over the Web.
- Example Web applications:
  - Banner
  - Expedia
  - Amazon
  - Google
  - Facebook
  - …

Web application

- What is the difference between a Web page and a Web application?

Web application

- What is the difference between a Web page and a Web application?

- You view a Web page in your browser at a fixed moment in time.
- Web application changes what you see, either by producing new Web pages, or by changing the Web page as you interact with it. You need a movie to get a picture of a Web app. A Web app may involve many Web pages.
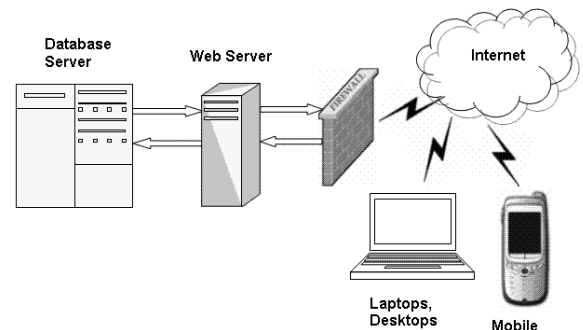
Web application

Web application

- How it works
  - Collection of programs
  - Some run in the Web browser, on your computer
  - Some run on a Web server
  - Pass information back and forth via internet
  - Generate new Web pages or alter existing Web pages to change what the user sees
  - Often involves a database on the server side

This is pretty complicated

- To build a Web app, you need lots of languages…
  - Web pages – HTML5 and CSS
  - Browser programs – Javascript and JQuery
  - Server-side programs – Lots of different Web app frameworks
    - PHP
    - Ruby on Rails
    - ASP.net
    - node.js – Javascript
    - Django – Python
    - Many others…

Nobody knows all of this

- Once you know some of it, the part you need for your next project becomes easier.
- We'll go through a selection of tools:
  - Object-oriented Python
  - HTML5 and CSS
  - Javascript
  - Django-Python server framework
- This will be enough to make some working Web apps

Web application

Database Server

Web Server

Internet

Python and Django

HTML/CSS and Javascript In browsers
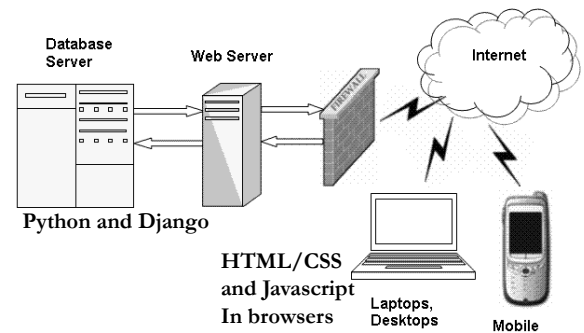
Laptops, Desktops

Mobile

Python 2

- We'll use Python 2, rather than Python 3.
- It's what is installed on the Linux machines we'll be using as Web servers.
- So let's use Python 2 right from the start.
- You can have both Python 2 and Python 3 installed on your computer.
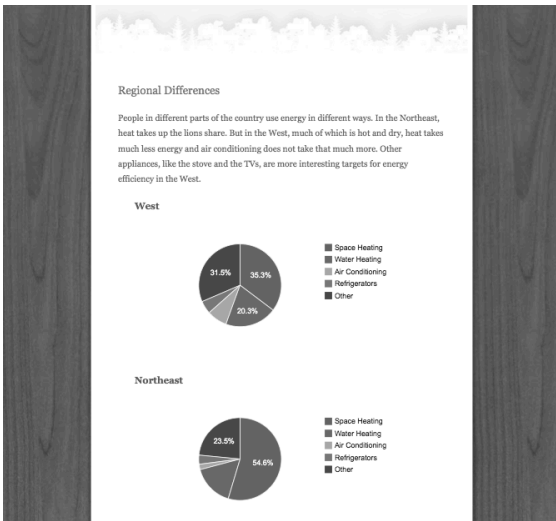
Course mechanics

- This is a four-unit course
- You can take it with permission of the instructor
- I will drop students who have credit for, or are taking, ECS 40
- Several programming projects
- Midterm, final – open book, open notes, programs
- Online texts

First Assignment

☐ Write a Python program that helps the user turn this dataset into...

	A	B	C	D	E	F	G	H	I	J	K	L	
			Total2	Space Heating3	Water Heating	Air Condi-tioning	Refrig-erators	Other4	Total2	Space Heating3	Water Heating	Air Condi-tioning	R er
6	Housing Unit Characteri and Energy Usage Indicators												
9	Total U.S.	113.6	10.183	4.226	1.803	0.635	0.484	3.035	89.6	38.7	16	6.8	
11	Census Region												
12	Northeast	20.8	2.235	1.22	0.366	0.038	0.08	0.531	107.6	59.6	17.7	2.3	
13	Midwest	25.9	2.914	1.487	0.48	0.067	0.116	0.764	112.4	58.2	18.7	3	
14	South	42.1	3.22	0.901	0.565	0.439	0.188	1.127	76.5	22.1	13.5	10.8	

Tools to communicate a data set

☐ Learn some HTML by writing a program to make a Web page.

☐ Start using the Google Visualization API to make the charts.

☐ Web applications are hard to write so we have frameworks like Django that handle a lot of it.

☐ We'll make a Web page ourselves now so that we understand later what Django is doing.

Using classes and objects in Python

☐ Django uses object oriented Python.

☐ Javascript is also object oriented, and learning about objects first in Python will make it easier (I hope).

☐ It is a good idea to learn object oriented programming since it makes it easier to write large programs that work, with parts that can be reused.

Classes

☐ We know Python allows us to add new functions.

☐ A class is like a new data type.

☐ In this program we create and use Chart and Web page classes.

Get started

☐ Go to course Web page.

☐ Install Python 2 on your computer.

☐ Read Chapter 13 in "Think like a Computer Scientist"