# LECTURE 01: INTRODUCTION

## Web Programming



## INSTRUCTOR: DR. HOSSAM ZAWBAA

# COURSE SYLLABUS

- **Introduction.**

- **Hypertext Markup Language (HTML).**

- **Cascading Style Sheets (CSS).**

- **PHP Fundamentals.**

- **PHP Statements & Operators.**

- **MySQL Fundamentals.**

- **PHP & MySQL.**

- **Basics of JavaScript.**

# Textbook

- Programming PHP, by Rasmus Lerdorf, Kevin Tatroe, and etc., O'Reilly, 2002. An electronic copy is available online:
- https://www.academia.edu/32791452/programming_PHP.pdf

Creating Dynamic Web Pages

3rd Edition

Programming

PHP

O'REILLY®

Rasmus Lerdorf, Kevin Tatroe & Peter MacIntyre
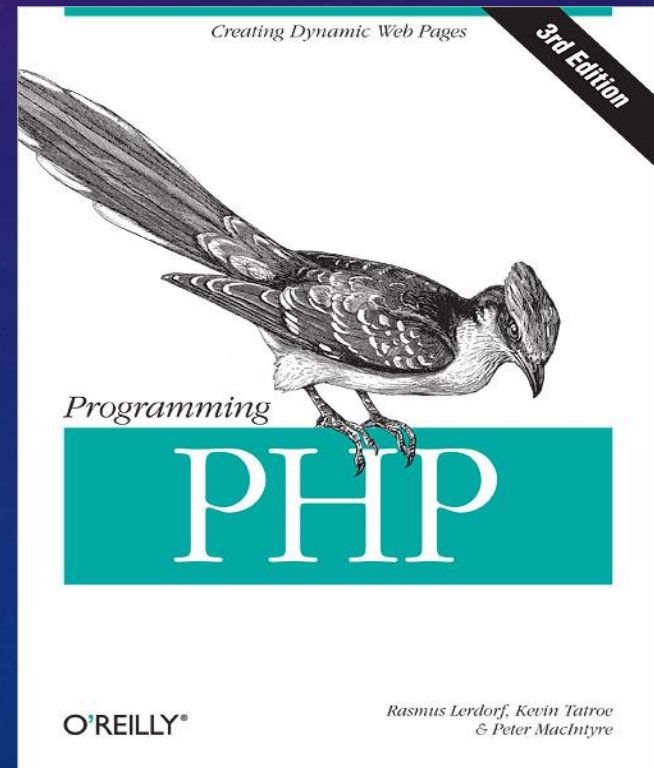
# GRADING

- **Lab assignments and attendance: 10%**

- **Final project: 20%**

- **Mid-term exam: 20%**

- **Final exam: 50%**

- **Extra credit: 5% for students who participate actively in the lectures.**

- **Extra credit: 5% for students who obtain the best final project.**
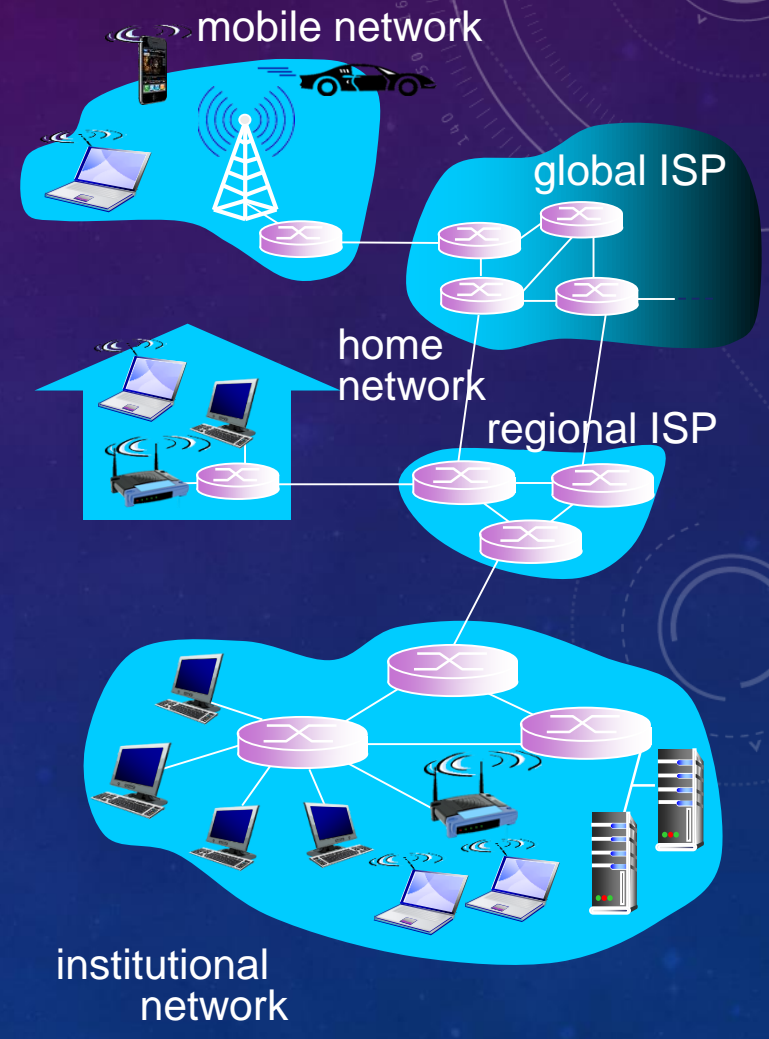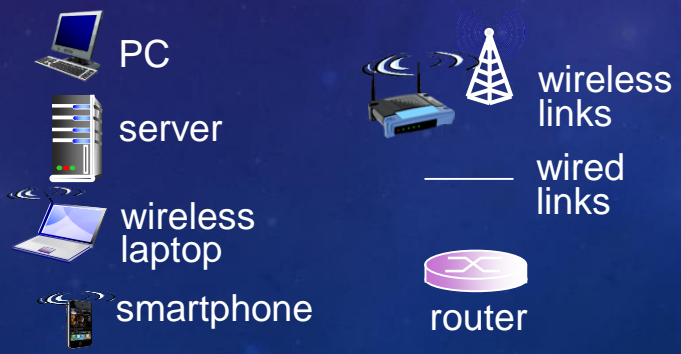
# Brief history of the internet

- Began as a US Department of Defense network called Advanced Research Projects Agency Network (ARPANET) (**1960s-70**s)

- Initial services: electronic mail (e-mail), file transfer

- Opened to commercial interests in late 80s

- WWW created in **1989-91** by **Tim Berners-Lee**

- Popular web browsers released: Netscape **1994**, IE **1995**

- Amazon.com opens in **1995**; Google January **1996**

# The Internet

- Millions of connected computing devices:

    - *hosts = end systems*

    - Running network apps

    The **Internet service provider (ISP)** is a company that provides individuals and other companies access to the Internet and other related services such as Web site building and virtual hosting.



mobile network

global ISP

home network

regional ISP

institutional network

PC

server

wireless laptop

smartphone

wireless links

wired links

router

# The Internet and WWW

- What's the difference between the Internet and the World Wide Web (WWW)?

    - Internet: a connection of computer networks using the Internet Protocol (IP).

    - the Web (WWW or W3) is the collection of web sites and pages around the world or simply it is a way of accessing information over the Internet medium.

    - The Internet is larger and also includes other services.

# Connection methods to access the internet

1. Dial-up access.

2. Multilink dial-up.

3. Integrated Services Digital Network.

4. Leased lines.

5. Cable Internet access.

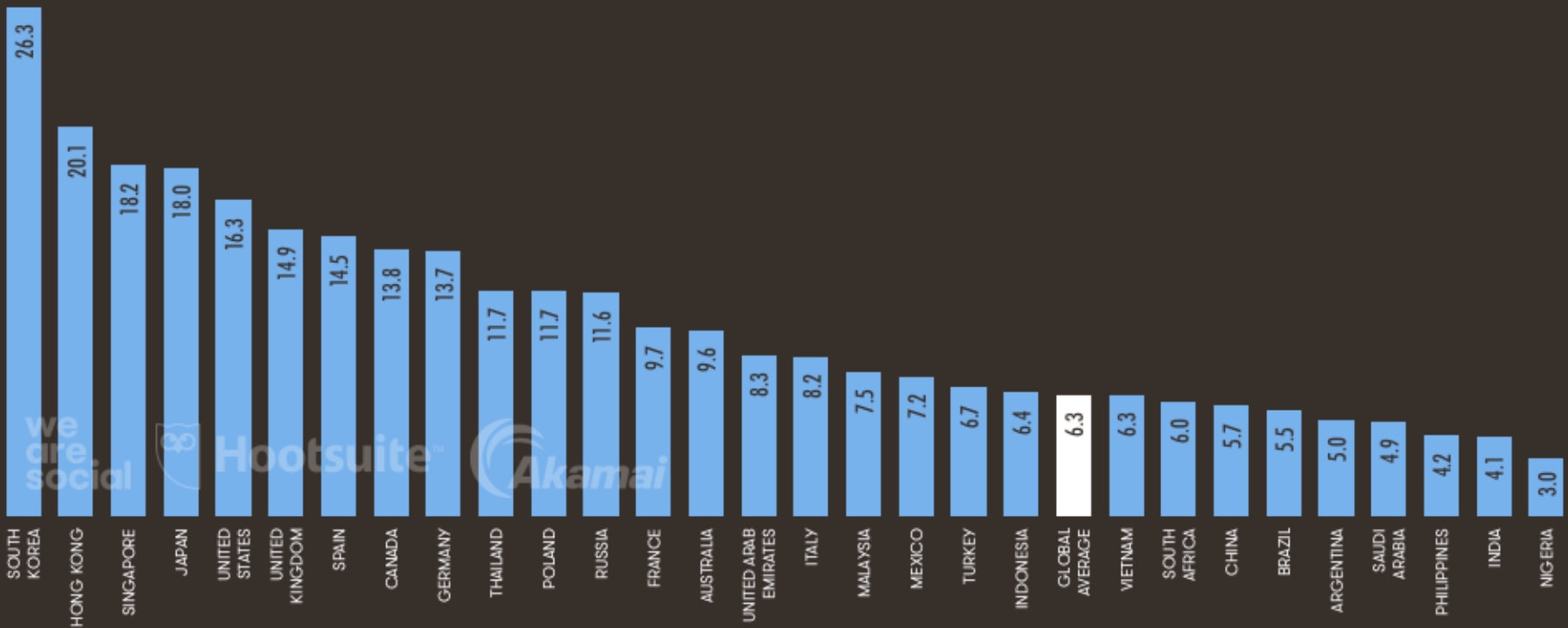6. Digital subscriber line (DSL, ADSL, SDSL, and VDSL)

7. Optical Fiber.

# Top countries in internet speed



https://www.fastmetrics.com/internet-connection-speed-by-country.php

# Top countries in internet speed
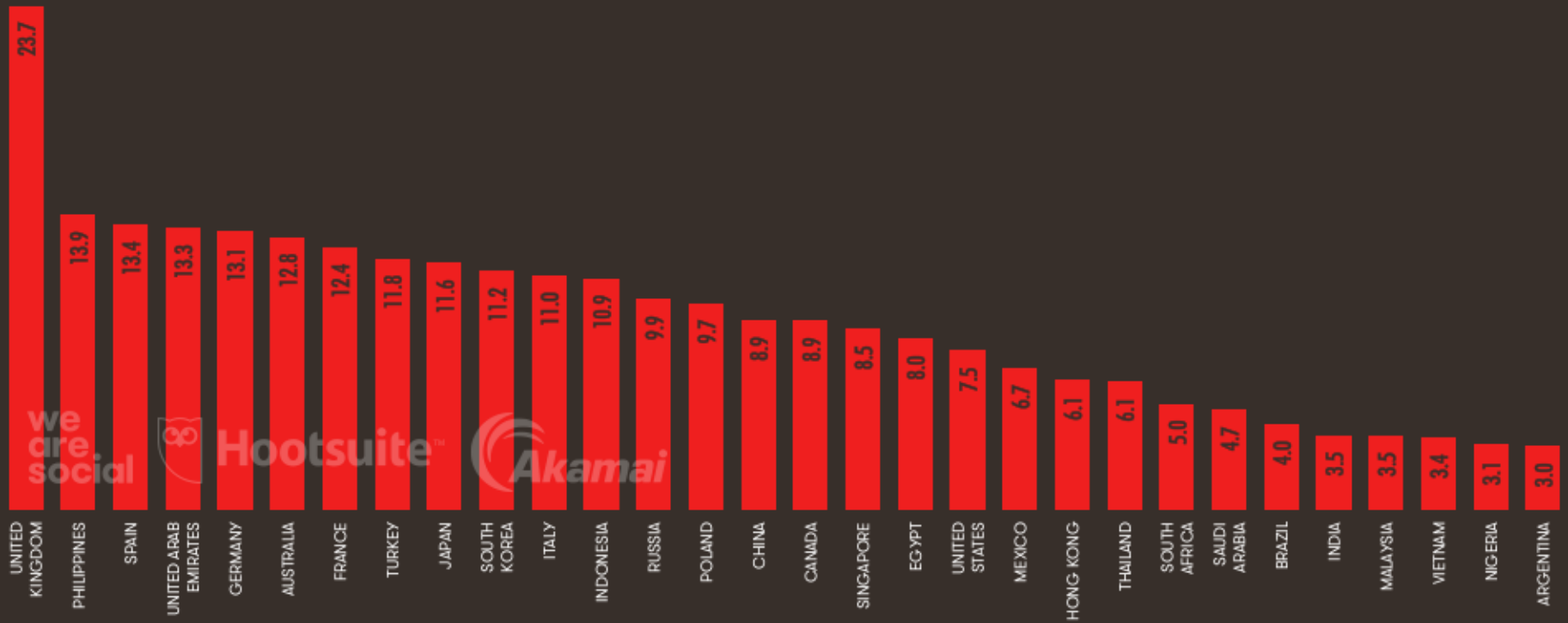
Internet Population and Penetration
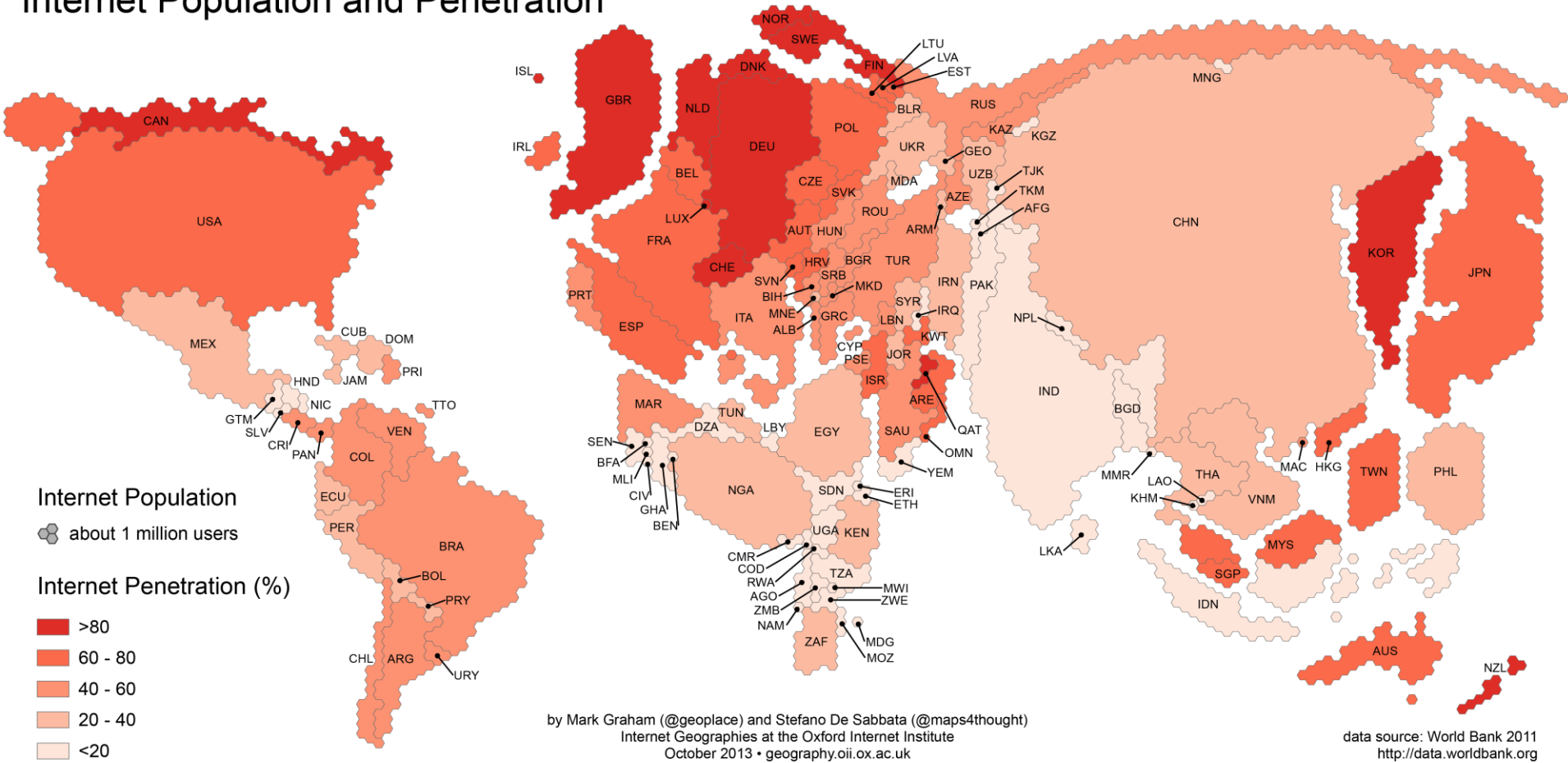
# Web servers and browsers

- **Web server**: software that listens for web page requests

  - Apache

  - Microsoft Internet Information Server (IIS) (part of Windows)

- **Web browser**: fetches/displays documents from web servers

  - Mozilla Firefox

  - Microsoft Internet Explorer (IE)

  - Apple Safari

  - Google Chrome

  - Opera

# Domain Name System (DNS)

- A set of servers that map written names to IP addresses
  - Example: www.cs.washington.edu → 128.208.3.88

- Many systems maintain a local cache called a hosts file
  - Windows: C:\Windows\system32\drivers\etc\hosts
  - Mac: /private/etc/hosts
  - Linux: /etc/hosts

# Domain Name System (DNS)

- Internet Service Providers (ISPs) maintain their own DNS servers and use **Dynamic Host Configuration Protocol (DHCP)** to automatically configure clients, relieving most home users of the burden of DNS configuration.

- **DHCP** allows a computer to join an IP-based network without having a pre-configured IP address.

- **DHCP** is a protocol that assigns unique IP addresses to devices, then releases and renews these addresses as devices leave and re-join the network.
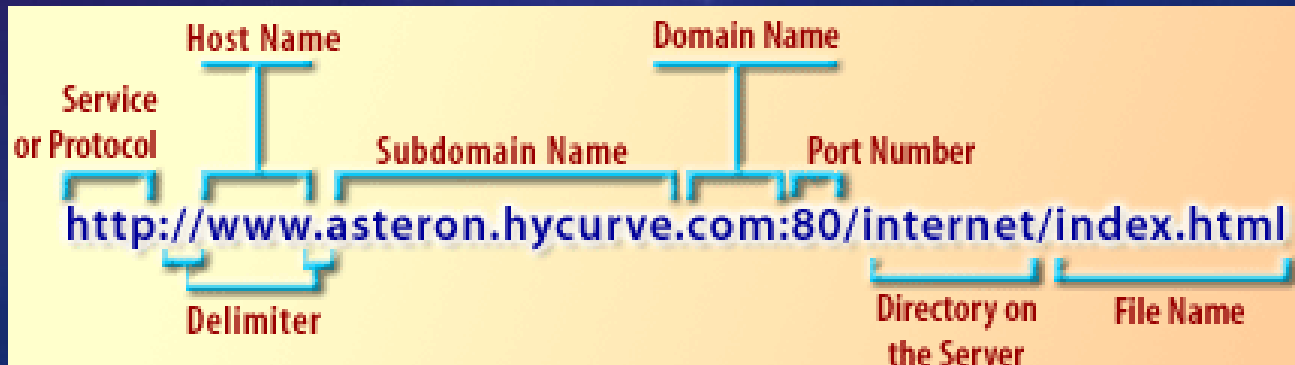
# Uniform Resource Locator (URL)

- An identifier for the location of a document on a website

- http://www.aw-bc.com/info/regesstepp/index.html

protocol      host            path

# Uniform Resource Locator (URL)

Once you entering this URL into the browser, it would:

- Ask the DNS server for the IP address of www.aw-bc.com

- Connect to that IP address at port 80 (default)

- Ask the server to GET /info/regesstepp/index.html

- Display the resulting page on the screen

# More advanced URLs

- **Anchor**: jumps to a given section of a web page
  - http://www.textpad.com/download/index.html#downloads
    - fetches index.html then jumps down to part of the page labeled downloads
- **Port**: for web servers on ports other than the default 80
  - http://www.cs.washington.edu:8080/secret/money.txt
- **Query string**: a set of parameters passed to a web program
  - http://www.google.com/search?q=miserable+failure&start= 10
    - parameter q is set to "miserable+failure"
    - parameter start is set to 10

# HyperText Transport Protocol (HTTP)

- The set of commands understood by a web server and sent from a browser

- Some HTTP commands (your browser sends these internally):

- **GET** filename : download

- **POST** filename : send a web form response

- **PUT** filename : upload

# HTTP error codes

- When something goes wrong, the web server returns a special "error code" number to the browser,

- Possibly followed by an HTML document

| Number | Meaning |
|--------|---------|
| 301-303 | page has moved (permanently or temporarily) |
| 403 | you are forbidden to access this page |
| 404 | page not found |
| 500 | internal server error |

# Internet media ("MIME") types

- **Multipurpose Internet Mail Extensions (MIME)** is an Internet standard that extends the format of email to support: Text in character sets other than ASCII. Non-text attachments: **audio, video, images, application programs, …** etc.

- Sometimes when including resources in a page (style sheet, icon, multimedia object), we specify their type of data

| MIME type | file extension |
|---|---|
| text/html | .html |
| text/plain | .txt |
| image/gif | .gif |
| image/jpeg | .jpg |
| video/quicktime | .mov |
| application/octet-stream | .exe |

# Web languages / technologies

- **HyperText Markup Language (HTML):** used for writing web pages

- **Cascading Style Sheets (CSS):** stylistic information for web pages

- **PHP Hypertext Processor (PHP), Active Server Pages (ASP),** and **Java Server Page (JSP):** dynamically create pages on a web server

- **JavaScript:** interactive and programmable web pages

- **Structured Query Language (SQL):** interaction with databases

# Client-side programming vs. Server side programming



**Database**　　**Web Server**　　**Internet**　　**Web Client**
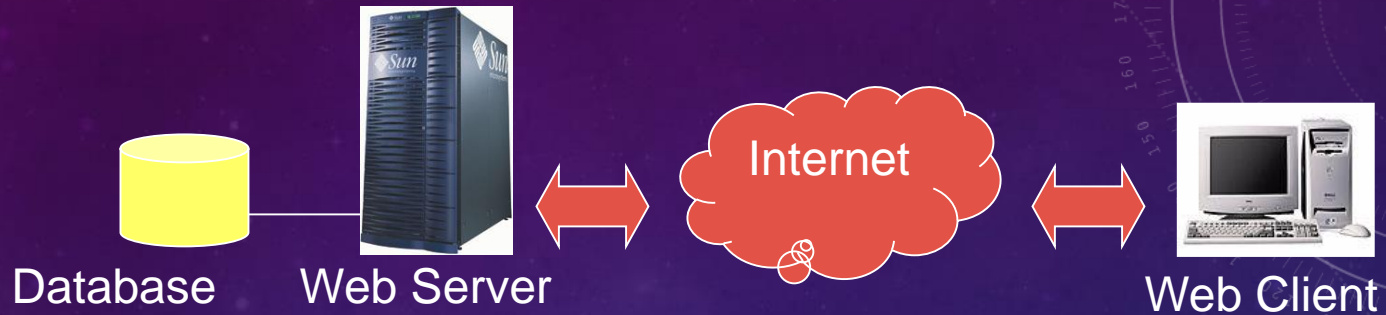
| Server-side Programming | Client-side Programming |
| --- | --- |
| Skills that are often required: | Skills that are often required: |
| • PHP | • HTML |
| • JSP/Servlet | • CSS |
| • ASP | • Javascript |
| • Python | • Dreamweaver |
| • MySQL/ SQL/ Oracle | • Flash |