

# LECTURE 01: INTRODUCTION

## Web Programming



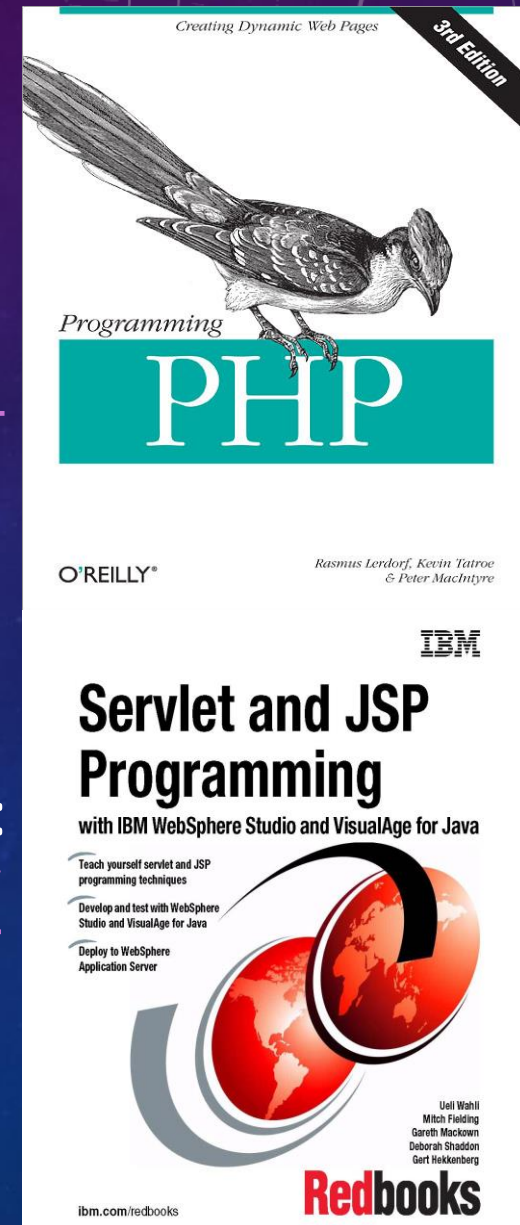
**INSTRUCTOR: DR. HOSSAM ZAWBAA**

# COURSE SYLLABUS

- Introduction.
- Hypertext Markup Language (HTML).
- Cascading Style Sheets (CSS).
- PHP Fundamentals.
- PHP Statements & Operators.
- MySQL Fundamentals.
- PHP & MySQL.
- Basics of JavaScript.
- Java Servlet/JSP Fundamentals.
- Java Servlet/JSP.

# Textbook

1. Programming PHP, by Rasmus Lerdorf, Kevin Tatroe, and etc., O'Reilly, 2002. An electronic copy is available online:  
[http://www.infoap.utcluj.ro/multi/programming\\_PHP.pdf](http://www.infoap.utcluj.ro/multi/programming_PHP.pdf)
2. Servlet and JSP Programming, with IBM WebSphere Studio and VisualAge for Java, 2000. An electronic copy is available online:  
<https://www.redbooks.ibm.com/redbooks/pdfs/sg245755.pdf>



# GRADING

- **Lab activities and assignments: 10%**
- **Lab attendance: 5%**
- **Final project: 15%**
- **Mid-term exam: 20%**
- **Final exam: 50%**
- **Extra credit: 5%** for students who participate actively on 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-70s)
- 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

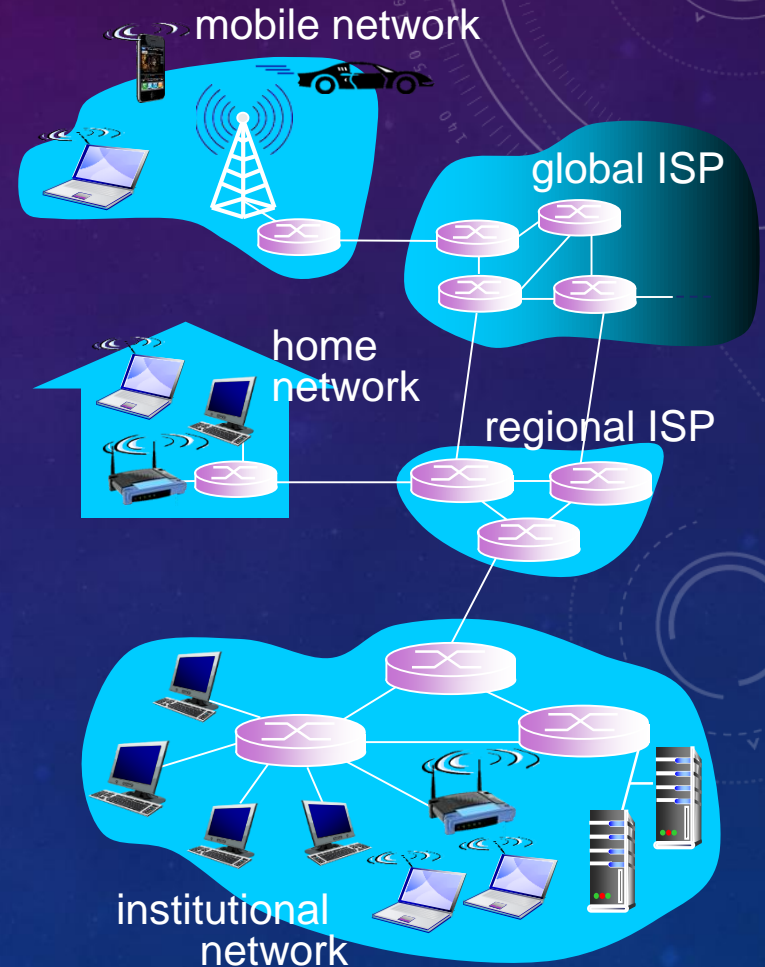


# The Internet

- 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.



# 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.

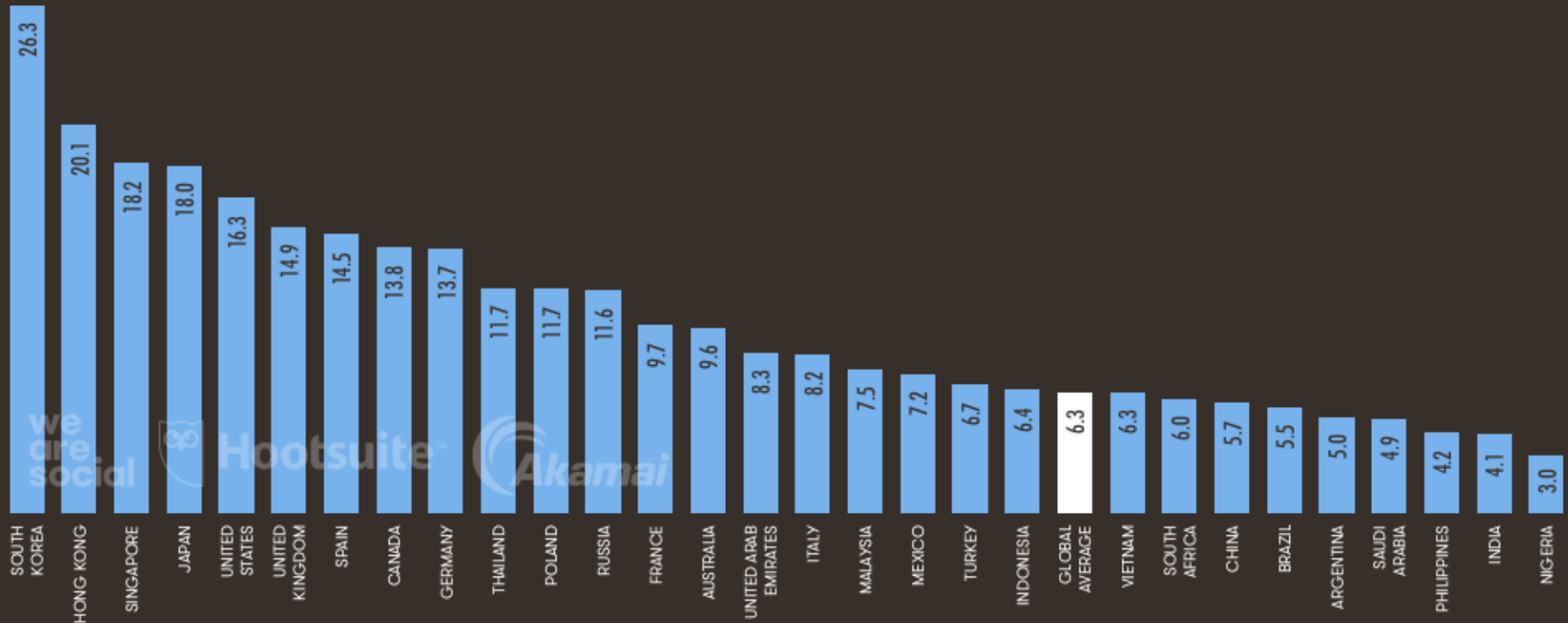


# Top countries in internet speed

JAN  
2017

## AVERAGE FIXED INTERNET CONNECTION SPEEDS

AVERAGE SPEED OF FIXED INTERNET CONNECTIONS BY COUNTRY, IN MBPS

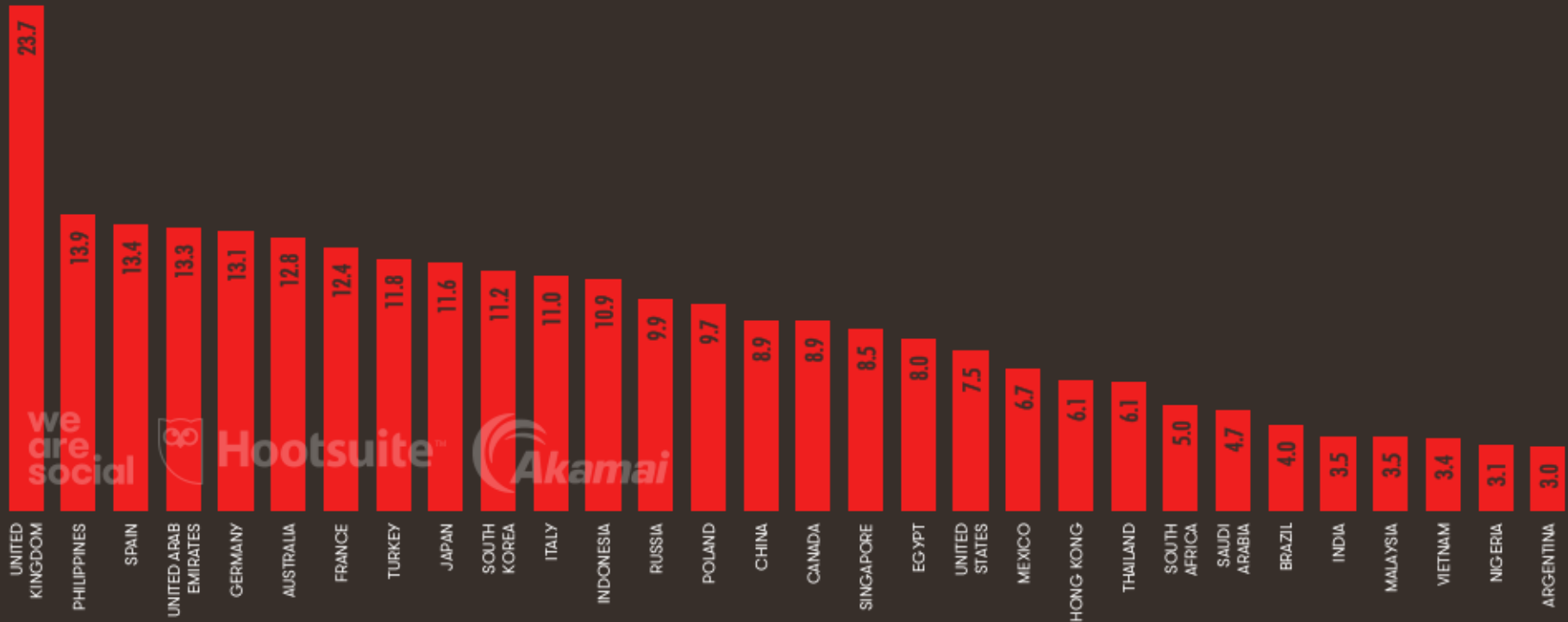


# Top countries in internet speed

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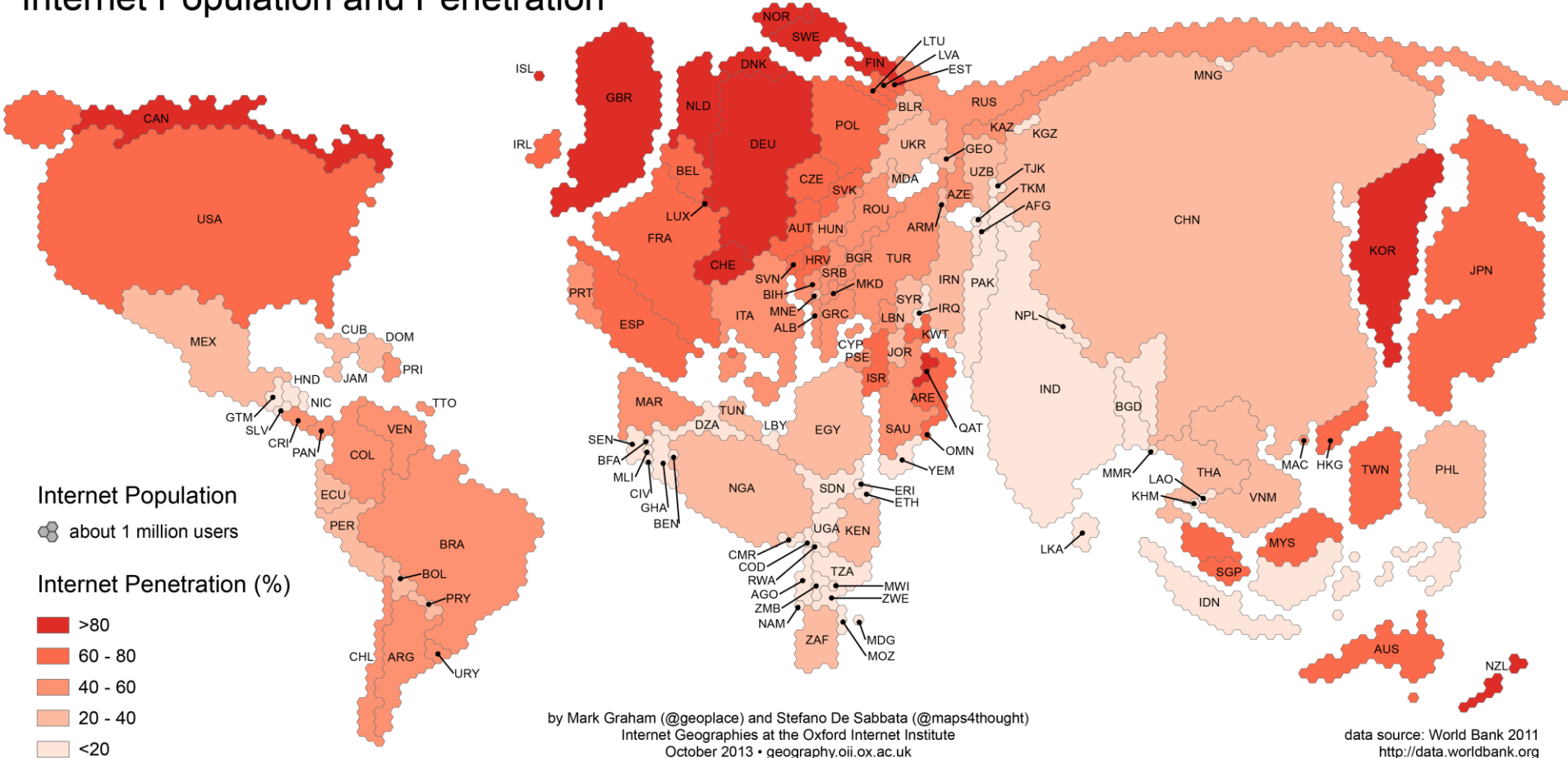
## AVERAGE MOBILE CONNECTION SPEEDS

AVERAGE SPEED OF MOBILE INTERNET CONNECTIONS BY COUNTRY, IN MBPS



# Internet Population and Penetration

## 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`

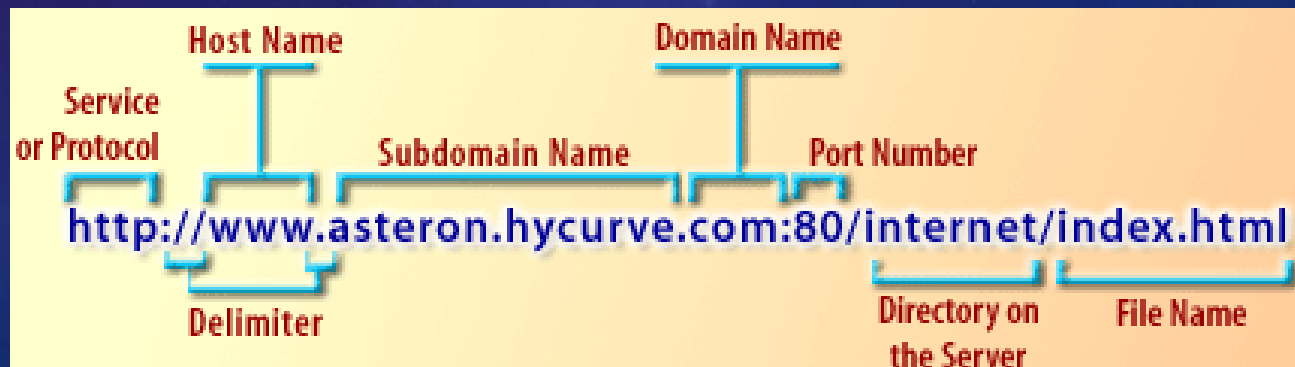
# Domain Name System (DNS)

- 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](http://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

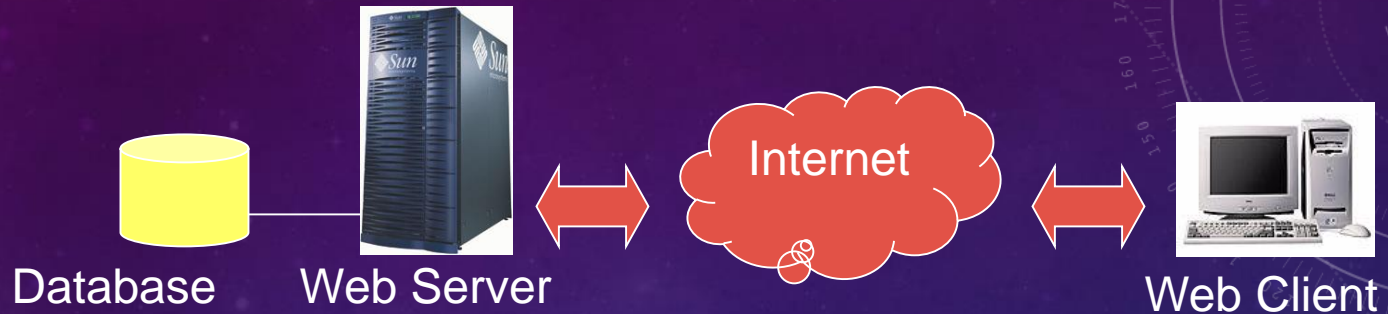
MIME type	file extension
text/html	.html
text/plain	.txt
image/gif	.gif
image/jpeg	.jpg
video/quicktime	.mov
application/octet-stream	.exe



# 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



## Server-side Programming

Skills that are often required:

- PHP
- JSP/Servlet
- ASP
- Python
- MySQL/ SQL/ Oracle

## Client-side Programming

Skills that are often required:

- HTML
- CSS
- Javascript
- Dreamweaver
- Flash