# Web Design & Web Programming

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# Contact Ways

Web Design & Web Programming Class

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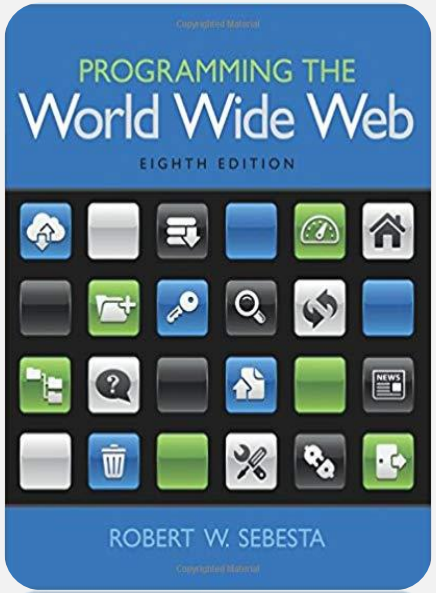
# Course Syllabus

| Titel | Grade |
| --- | --- |
| Final Exam | 6 |
| Term Project | 6 |
| Homework | 6 |
| Attendance, participation in-class | 2 |

# References


1. R. W. Sebesta, “Programming the World Wide Web”, 7th Edition, Prentice Hall, 2012.
2. HTML And CSS Tutorials, https://www.w3schools.com/
3. ASP and ASP.NET Tutorials, https://www.w3schools.com/
4. C# Tutorial , https://www.w3schools.com/

# Technology used

In this class, we use the ASP.Net framework as the technology used to design web pages

## ASP.Net

- Web pages designed in this class are based on ASP.NET technology.
- This technology is developed and supported by Microsoft company.
- Our development environment is Visual Studio 2017 enterprise edition.



# Chapter 1

## Introduction

# Internet vs World Wide Web

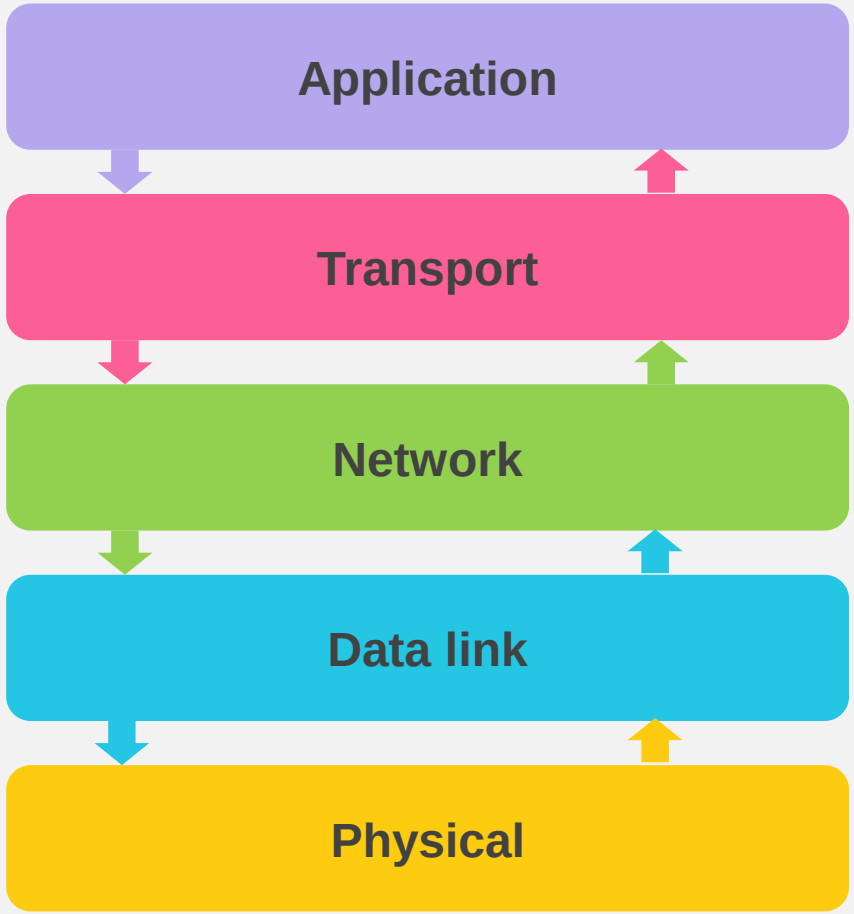
- The Internet
  - ❖ Network of networks that use the Internet protocol suite to link billions of devices worldwide.
  - ❖ Consists of millions of private, public, academic,business, government networks.
  - ❖ Networks linked together by electronic, wireless, & optical networking technologies.
  - ❖ Carries information resources and services, e.g. WWW

# Brief history of the Internet

- The Internet
  - 1968 - DARPA (Defense Advanced Research Projects Agency) contracts with BBN (Bolt, Beranek & Newman) to create ARPAnet
  - 1970 - First five nodes: UCLA, Stanford, UC Santa Barbara, U of Utah, and BBN.
  - Initial services: electronic mail, file transfer.
  - 1974 - TCP specification by Vint Cerf
  - 1984 – On January 1, the Internet with its 1000 hosts converts en masse to using TCP/IP for its messaging
  - Opened to commercial interests and most universities in late 80s.
  - WWW created in 1989-91 by Tim Berners-Lee.
  - Early web browsers released: Mosaic 1992, Netscape 1994, Internet Explorer 1995.
  - Amazon.com opens in 1995; Google January 1996.

# Internet: Layered Network Architecture

- **Physical layer**: devices such as Ethernet, coaxial cables, fiber-optic lines, modems
- **Data link layer**: basic hardware protocols (ethernet, wifi, DSL PPP)
- **Network / internet layer**: basic software protocol (IP)
- **Transport layer**: adds reliability to network layer (TCP, UDP)
- **Application layer**: implements specific communication for each kind of program (HTTP, POP3/IMAP, SSH, FTP)




# Internet Protocol

# Internet Protocol (HTTP)

- Original web communication protocol
- Request-Response type
  - Client (browser) will open a connection to a server and then send a request using a very specific format
  - Server will respond and close the connection
- Stateless
  - Does not maintain any connection information between transaction information
- Feature
  - Negotiation of data representation, allowing systems to build indepently of the data being transferred

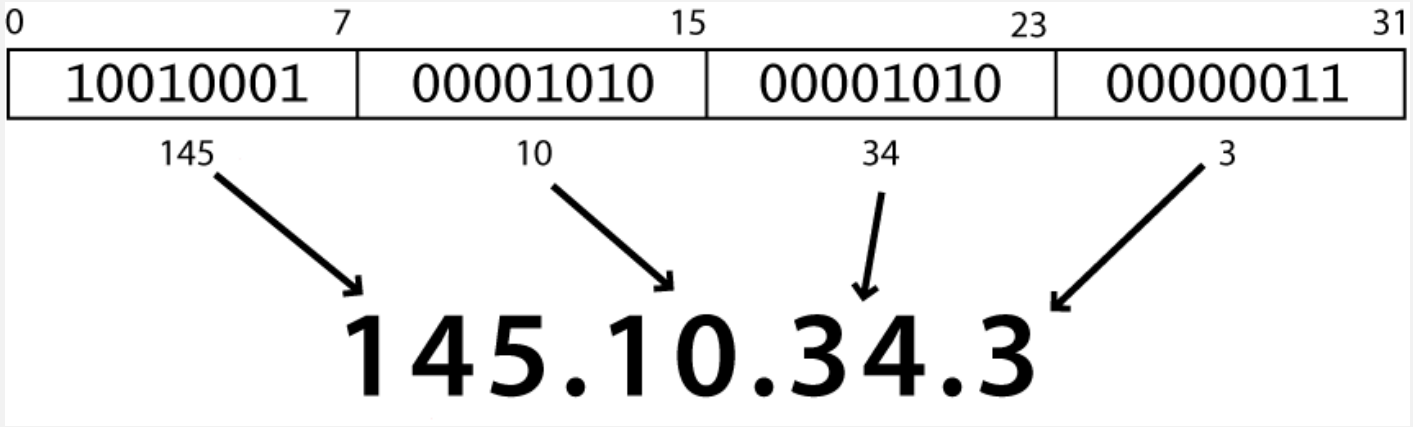
# HTTP Request and response

# Internet Protocol (TCP/IP)

- Adds multiplexing and guaranteed packet delivery on top of IP
- Multiplexing: multiple programs using the same IP
  - ✓ port: a number given to each program or service
  - ✓ port 80: web client (port 443 for secure web browsing)
  - ✓ port 25: email
  - ✓ port 22: ssh and sftp
  - ✓ port 27017: mongoDB
- Some programs (games, streaming media programs) use simpler **UDP** protocol instead of **TCP**

# Internet Protocol (IPv4)

- Simple protocol for attempting to exchange data between two computers
- Each device has a 32-bit IP address written as four 8-bit numbers (0-255)
- Find out your internet IP address:  http://ip-lookup.net/
- Find out your local IP address: in a terminal window, type: ipconfig (Windows) or ifconfig (Mac/Linux)



# World Wide Web

## The WWW comprises Web Servers and Web Browsers

- The **web** is a tool used to retrieve information published on the **internet**
- To **navigate** the web we use a **browser** i.E. Netscape or internet explorer
- **Web Server:**

  software that listens for Web page requests and serves up the requested pages

  Apache - http://www.apache.org

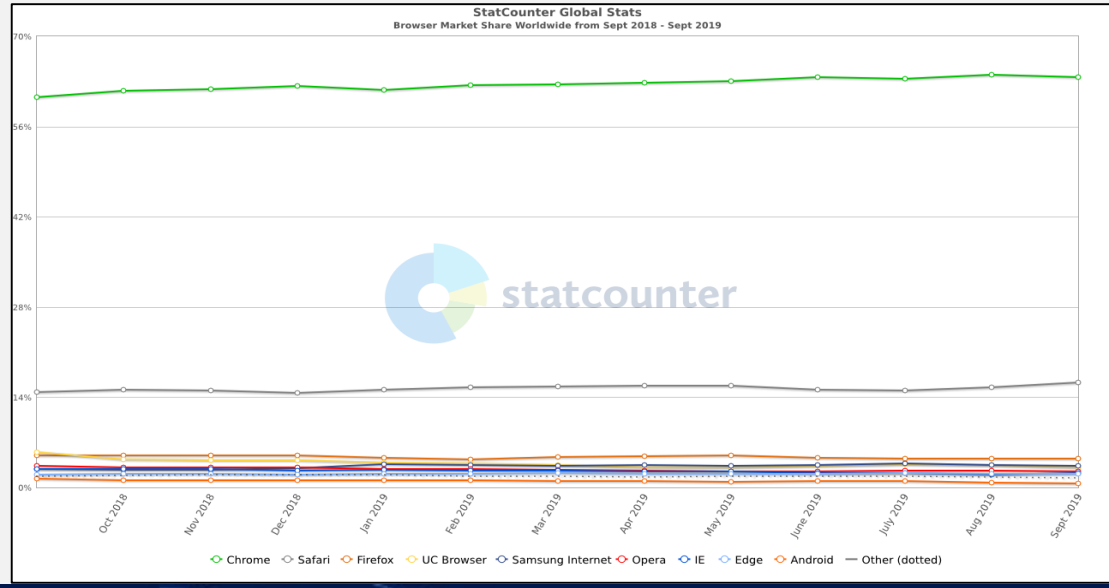
  Microsoft Internet Information Server (IIS) - http://www.iis.net/

  Express - https://expressjs.com

  Phusion Passenger - https://www.phusionpassenger.com

# World Wide Web

- **Web browser**: gets and renders documents from servers
- **Popular browsers:**
  - **Chrome**
  - **Safari**
  - **Firefox**
  - **Samsung internet**
  - **UC Browser**
  - **Opera**
  - **IE**
  - **Edge**



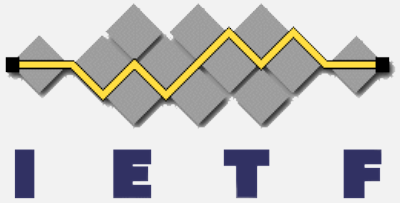

statcounter
GlobalStats

| Chrome | Safari | Firefox | Samsung Internet | UC Browser | Opera |
|---|---|---|---|---|---|
| 63.72% | 16.34% | 4.45% | 3.34% | 3.15% | 2.5% |

Browser Market Share Worldwide - September 2019

# Organizations you should know

- Internet Engineering Task Force (IETF)
  - internet protocol standards
- Internet Corporation for Assigned Names and Numbers (ICANN
  - decides top-level domain names
- World Wide Web Consortium (W3C)
  - web standards





# Domain Name System (DNS)

DNS:

Set of servers that map domain names to IP addresses

- **Example:**

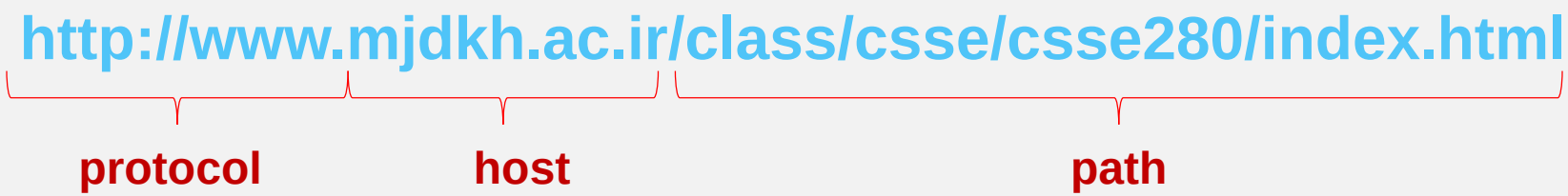
  www.mjdkh.ac.ir -> 178.239.147.5

- **DNS Lookup Tool**

  http://mxtoolbox.com/DNSLookup.aspx

# Uniform Resource Locator (URL)

Web Address OR an ID for the location of a Web resource on a computer network




When this URL is entered in the browser, it would:

- Ask the DNS server for the IP address of www.mjdkh.ac.ir
- Connect to that IP address at port 80
- Ask the server to GET /class/csse/csse280/index.html and display the result in the browser

# Advanced URLs

**Anchor**: jumps to a given section of a page

- http://en.wikipedia.org/wiki/HTML_element#**Anchor**

Fetches the HTML_element document, then jumps to the part of the page labeled Anchor

**Port**: for web servers on ports other than the default port 80

- http://portquiz.net**:8080**/index.php

# Advanced URLs

**Query string**: a set of parameters passed to a web application

http://www.google.com/search**?q=miserable+failure&start=10**

- parameter named q is set to value miserable+failure
- Parameter named start is set to value 10

# Hypertext Transfer Protocol (HTTP)

Defines a set of commands understood by a Web server and sent from a browser

Some HTTP commands (your browser sends these internally)

- GET resource -- requests data from a specified resource
- POST resource -- submits data to be processed to a specified resource
- PUT resource -- uploads a representation of the specified URL
- DELETE resource -- deletes the specified resource

# HTTP status codes

When a request is made by the browser, a response is sent back by the server with a status code, possibly followed by a Web resource

| Number | Meaning |
|---|---|
| 200 | OK |
| 301-303 | Page has moved (temporarily or permanently) |
| 403 | It is forbidden to access this page |
| 404 | Page not found |
| 500 | Internal server error |
| Complete list of HTTP status codes | |

# Internet Media Types (MIME)

Sometimes when including other resources in a Web page (stylesheet, image, multimedia object), we specify their type of data

| MIME Type | File Extension |
|---|---|
| text/html | .html |
| text/plain | .txt |
| image/gif | .gif |
| image/jpeg | .jpg |
| videeo/quicktime | .mov |
| application/octec-stream | .exe |

# Basic HTML

Defines the **content** and **structure** of information on a page

- Not the same a **presentation** (appearance in the browser)

Surrounds text content with opening and closing **tags**

Each tag's name represents an HTML **element**

- Syntax: <tagname>Content goes here...</tagname>

Most whitespace is collapsed or ignored in HTML

We will use HTML5 syntax

# Structure of HTML page

**DOCTYPE** tells browser to interpret code as HTML5

**HTML** page is save in a file with extension .html

The **header** describes the page, and the body holds the page's content

```
<!DOCTYPE html>
<html>
    <head>
        information about the page
    </head>

    <body>
        page contents
    </body>
</html>
```