

Web/Python Programming

웹/파이썬 프로그래밍

[illegible]

For the rest of this course...

- Common terms used in web development
- Client-side development techniques
- Server-side development techniques
- Basics of web application development on internet
- HTML/CSS/Javascript
 - Web page → Front-side → Server-side → **Full stack !!**
- Python, Node.js
 - Data processing & Cloud computing → Server-side → Client-side **(started)**

Creating a website

- Creating a dynamic HTML site
 - Use Javascript to accept user input
 - Make your site responsive to user needs
-
- Learning fundamentals of web development
 - Lay foundation for future courses
 - Prepare to build larger, more complex sites

Today

- Introduction to Web programming
 - Basics of the web
 - HTML
 - URL
 - HTTP

What is web programming?

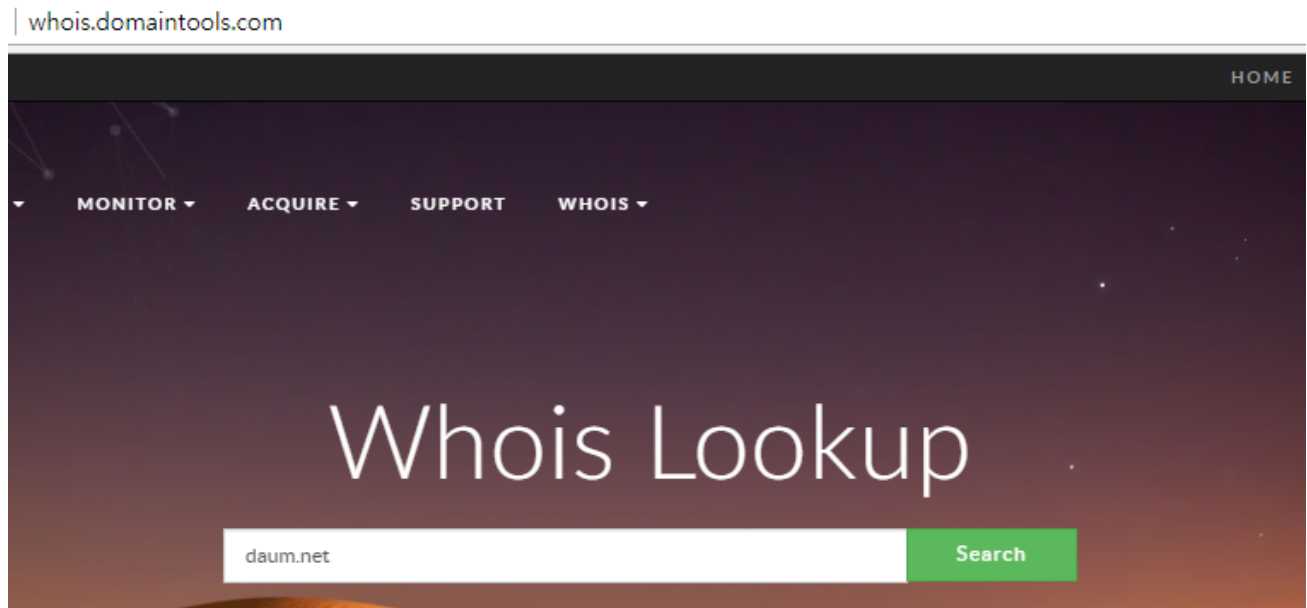
- Web programming refers to the writing, markup, and coding involved in Web development, which includes
 - Web content
 - Web client and server scripting
 - Network security
- Most common languages used for web programming are
 - HTML
 - CSS
 - Javascript
 - XML
 - Python
 - Perl 5
 - PHP

Web development

- Developing a web site for the internet (World Wide Web) or an intranet (a private network).
- From developing the simplest static single page of plain text
- To the most complex web-based internet applications, electronic businesses, and social network services.

Networks and the internet

- Where is a website?
- www.daum.net
- whois.domaintools.com





Networks and the internet

■ www.daum.net

⇒ 203.133.167.16 (IP address)

⇒ Internet Protocol

— Domain Profile

Registrant	Kakao Corp.
Registrant Country	KR
Registrar	Netpia.com, Inc. IANA ID: 130 URL: http://www.ibi.net Whois Server: whois.ibi.net reportabuse@ibi.net (p) 8216445001
Registrar Status	ok
Dates	8,100 days old Created on 1996-03-04 Expires on 2020-03-05 Updated on 2016-08-17
Name Servers	NS1.DAUM.NET (has 190 domains) NS2.DAUM.NET (has 190 domains)
Tech Contact	Kakao Corp. 242, Jeju-si Cheomdan-ro, Jeju-do, KR, Jeju-do, 63309, KR domain@kakaocorp.com (p) 8226710158 (f) 82
IP Address	203.133.167.16 - 7 other sites hosted on this server
IP Location	 - Gyeonggi-do - Yongin - Daou Technology
ASN	 AS9764 DAUM-NET Kakao Corp, KR (registered Dec 10, 1999)
IP History	279 changes on 279 unique IP addresses over 14 years
Registrar History	1 registrar with 3 drops
Hosting History	2 changes on 2 unique name servers over 15 years

Domain Name Service (DNS)

- Using a name (e.g. daum.net), DNS finds an IP address for us
- Runs on...
 - Hosting service computers
 - ISP = Internet Service Provider
 - Smartphone or cellular provider
- ISP: Who do you use to reach the internet?



Domain Name Service (DNS)


- Lets you use names
- No need for complicated numbers
- Protects you from changes to IP address

- For example,

- 203.133.167.16 belongs to 
 - Daum can change equipments, change IP address as they need to.
 - All you need to remember is, daum.net

IP Information for 203.133.167.16

— Quick Stats

IP Location	 Korea, Republic Of Yongin Daou Technology
ASN	 AS9764 DAUM-NET Kakao Corp, KR (registered Dec 10, 1999)
Whois Server	whois.apnic.net
IP Address	203.133.167.16
Reverse IP	8 websites use this address.

Basics of the web

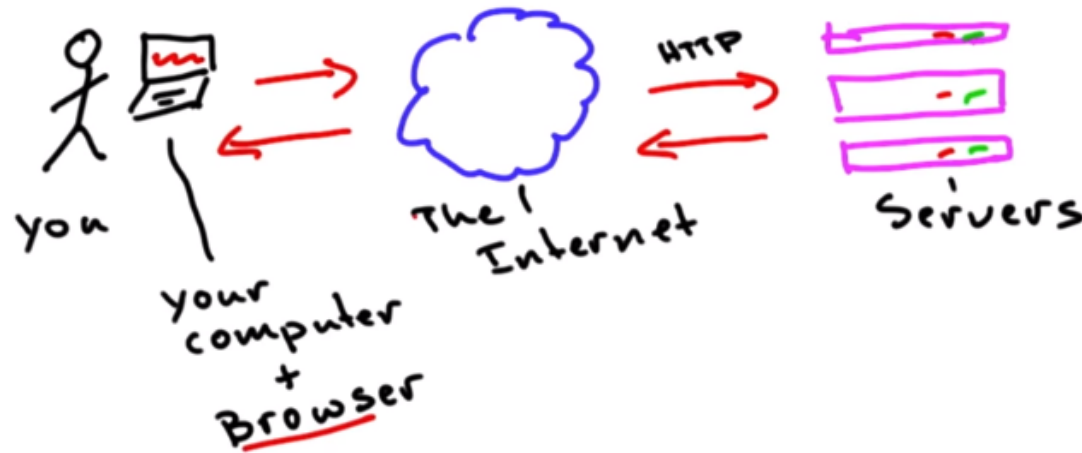
- The web
- HTML: document
- URLs: how you refer to documents on the web
- HTTP: protocol
- Web applications

World wide web



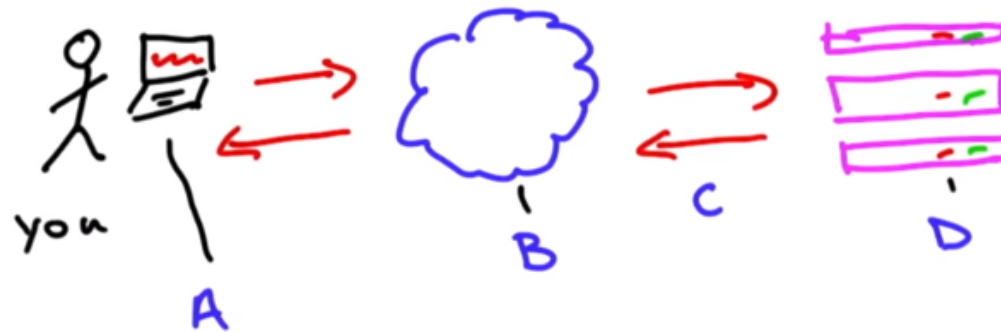
- Collection of HTML documents
- HTML: HyperText Markup Language
- HTML is the basis for almost every webpage
- There are documents, images, videos, and etc. online – HTML glues them together
- Hyperlinks/links: links between the pages
- Web is invented in 1990s and contains about 30 billion pages.

Major pieces of the web



- Your browser makes requests via the internet to servers.
- These requests use a protocol called HTTP.
- The servers respond with files that your browser displays

Major pieces of the web: Quiz



- HTTP: The main protocol of the web
- Servers: Computers that host the files that make up the web
- Internet: The world's largest computer network
- Browser: A program that runs on your computer to display files found on the web

HTML: HyperText Markup Language

- HTMLs are made of...
 - Text content: what you see
 - Markup: what it looks like, how it is arranged
 - References to other documents: images + videos
 - Links to other pages
- HTML practice
 - Notepad -> Save as .html
 - Open the file with a browser (ex. Chrome)
 - Notepad can be replaced with other text editors
 - Ex. Sublime Text, Notepad++

HTML markup

- Tags
- Opening tag, closing tag
- Element
- Bold tag
- Italic tag

```
<Name>Contents</Name>
```

```
I am going to learn to <b>love</b> HTML.
```

```
I am going to <em>learn</em> to <b>love</b> HTML.
```

HTML attributes

- Anchor - <a> tag

<Tag Attr="value">Contents</Tag>

click here

Attribute
name

value

Contents

- Image - tag: void tag

Contents

Whitespace

This is a really long sentence for a line.

This is a really long
sentence for a line.

This is a really long

sentence for a line.

<p>This is a really long</p>
<p>sentence for a line.</p>

-
: break (void tag)
- <p>Content</p>: paragraph

Inline/block

- `
` - inline

text`
`text

text

text

``, ``, `<a>`, ``

``, ``

- `<p>Contents</p>` - block

`<p>`text`</p>`text

text

text

`<p>`

`<div>`, `<form>`

HTML documents

```
<!DOCTYPE html>
<html>

<head>
<title>Title of the document</title>
</head>

<body>
Content of the <b>document</b>
</body>
</html>
```

html

<head>

Title CSS Javascript

</head>

<body>

Contents

</body>

URLs

- Uniform Resource Locator

- http://www.naver.com/



- Protocols: http, https, ftp
- Host name (domain name) translates to IP address, which locates the server that has the documents.
- Path is the document that we want to access.

`http://www.udacity.com/cs253x/hipmunk.png`

URL: Query parameters (GET parameters)

`http://example.com/foo?p=1`

Name = value

`http://example.com/foo?p=1&q=neat`

`http://example.com/foo?p=foo&z=p`

URL: fragments

`http://www.example.com/foo#fragment`

To reference a particular part of the page you are looking at.
Not sent to the server, purely exists in the browser

`http://www.example.com/foo?p=1#fragment`

URL: port

`http://localhost:8000/`

- Default port: 80
- If you want to use a different port, you need to include it between the host and the path separated by a colon.

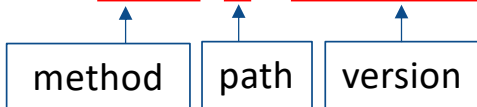
HTTP

- Hyper Text Transfer Protocol
- Main protocol of the web
- What your browser uses to talk to the servers.

`http://www.example.com/`

- The request from the browser to the server begins with a request line

GET / HTTP/1.1



HTTP Request – a request line and headers

- A request line
GET /foo?p=1 HTTP/1.1
 - Followed by headers.
Host: www.example.com
 - Name: value
User-Agent: Chrome v.17
-
- One web server can host many websites
 - E.g. Web hosting company can host many websites

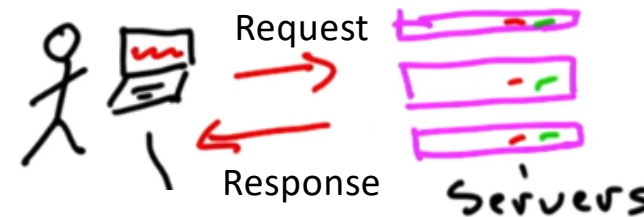
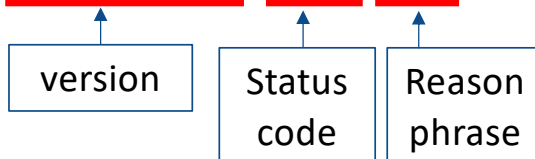
HTTP Responses

- Request (Request line)

GET /foo HTTP/1.1

- Response (Status line)

HTTP/1.1 200 OK



- Status code

- 200 OK: The document is found
- 302 Found: The document is located somewhere else.
- 404 Not found: The document is not found.
- 500 Server Error: The server broke while handling your request

HTTP Response

- Basic response status line
- Followed by headers

HTTP/1.1 200 OK

Date: Tue Mar 2012 04:33:33 GMT

Server: Apache/2.2.3

Content-Type: text/html;

Content-Length: 1539

Request – Response

- Chrome://apps
- Chrome 웹 스토어
- Rest client 검색: Yet Another REST Client 추가
- REST: Representational state transfer
- One way of providing interoperability between computer systems on the internet

Request – Response

Response

Request URL: <http://www.naver.com/>
Request Method: GET
Response Time: 0.04 seconds
Response Status: 200 - OK

200

[Response Body](#)

[Response Body \(RAW\)](#)

[Response Preview](#)

[Response Headers](#)

[Request Details](#)

```
{
  "pragma": "no-cache",
  "date": "Fri, 12 May 2017 14:42:46 GMT",
  "content-encoding": "gzip",
  "server": "NWS",
  "x-frame-options": "SAMEORIGIN",
  "p3p": "CP=\\\"CAO DSP CURa ADMa TAIa PSAa OUR LAW STP PHY ONL UNI PUR FIN COM NAV INT DEM STA PRE\\\"\"",
  "status": 200,
  "cache-control": "no-cache, no-store, must-revalidate",
  "content-type": "text/html; charset=UTF-8"
}
```

Request – Response

Response

Request URL: <http://www.naver.com/aaa.html>
Request Method: GET
Response Time: 0.016 seconds
Response Status: 404 - Not Found

404

[Response Body](#)

[Response Body \(RAW\)](#)

[Response Preview](#)

[Response Headers](#)

[Request Details](#)

```
{
  "pragma": "no-cache, no-cache",
  "date": "Fri, 12 May 2017 14:35:13 GMT",
  "content-encoding": "gzip",
  "server": "NWS",
  "p3p": "CP=\\\"CAO DSP CURa ADMa TAIa PSAa OUR LAW STP PHY ONL UNI PUR FIN COM NAV INT DEM STA PRE\\\", CP=\\\"CAO DSP CURa ADMa TAIa PSAa OUR LAW STP PHY ONL UNI PUR FIN COM NAV INT DEM STA PRE\\\"",
  "status": 404,
  "cache-control": "no-cache, no-store, must-revalidate, no-cache, no-store, must-revalidate",
  "content-type": "text/html; charset=UTF-8"
}
```