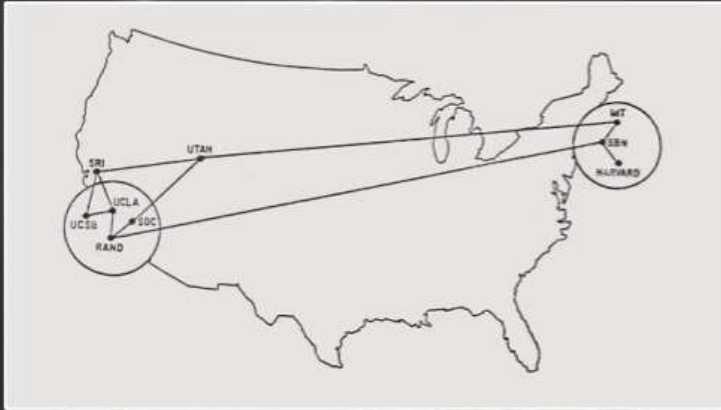


CS50: Week 8 - HTML, CSS, JavaScript



routers

TCP/IP

HTTP is a protocol for sending information over the internet, while HTTPS is a more secure version of HTTP that encrypts data.

| | HTTP | HTTPS |
|------------------|--|---|
| Security | Less secure, vulnerable to man-in-the-middle attacks | More secure, protects against man-in-the-middle attacks |
| How it works | Exchanges data as plaintext | Uses encryption to establish a secure connection before transferring data |
| What it protects | Exchanges information like website content and API calls | Protects sensitive information like login credentials and credit card information |
| How it's used | The underlying technology for network communication | An extension of HTTP that uses TLS (SSL) to encrypt HTTP requests and responses |



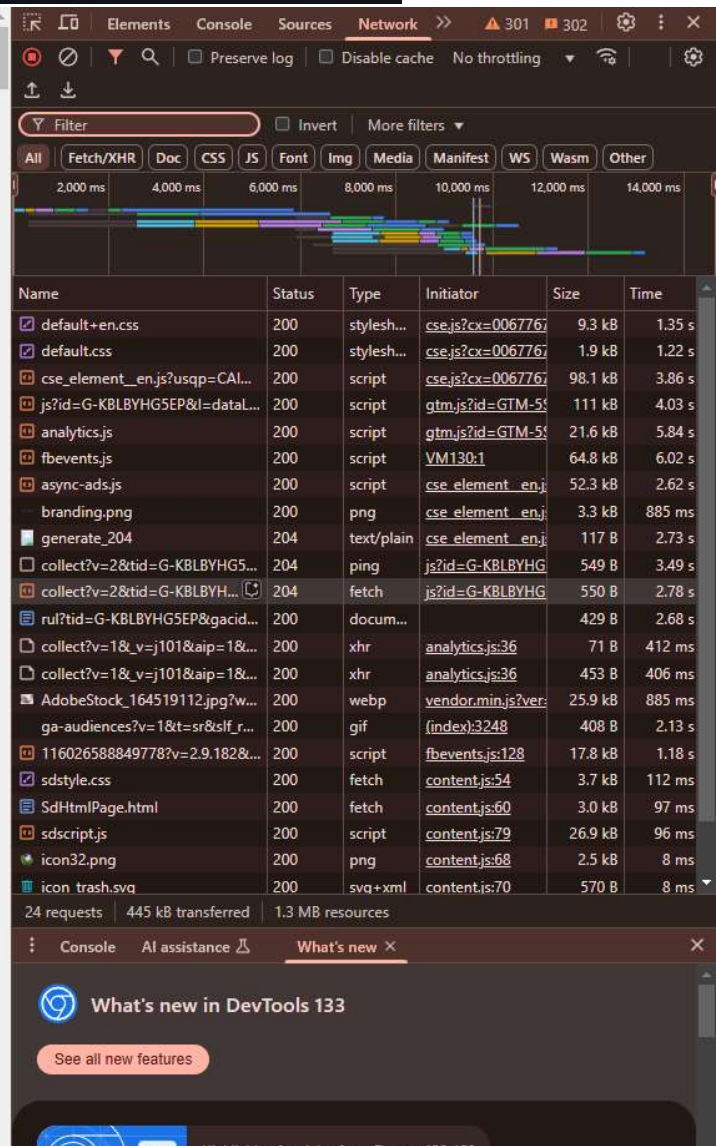
HARVARD UNIVERSITY

Cancer

Harvard researchers are exploring a holistic view of the disease, from fine tuning prevention and diagnosis to bolstering treatment and support.

Looking for accurate cancer information?

Harvard Chan School's **Cancer FactFinder** has evidence-based information in nine languages.



Elements Console Sources **Network** >> 301 302

Filter Invert More filters

All Fetch/XHR Doc CSS JS Font Img Media Manifest WS Wasm Other

2,000 ms 4,000 ms 6,000 ms 8,000 ms 10,000 ms 12,000 ms 14,000 ms

| Name | Status | Type | Initiator | Size | Time |
|--------------------------------|--------|------------|----------------------|---------|--------|
| default+en.css | 200 | stylesh... | cse.js?cx=0067767 | 9.3 kB | 1.35 s |
| default.css | 200 | stylesh... | cse.js?cx=0067767 | 1.9 kB | 1.22 s |
| cse_element_en.js?usqp=CAI... | 200 | script | cse.js?cx=0067767 | 98.1 kB | 3.86 s |
| js?id=G-KBLBYHG5EP&l=data... | 200 | script | gtm.js?id=GTM-5 | 111 kB | 4.03 s |
| analytics.js | 200 | script | gtm.js?id=GTM-5 | 21.6 kB | 5.84 s |
| fbevents.js | 200 | script | VM130:1 | 64.8 kB | 6.02 s |
| async-ads.js | 200 | script | cse element_en.js | 52.3 kB | 2.62 s |
| branding.png | 200 | png | cse element_en.js | 3.3 kB | 885 ms |
| generate_204 | 204 | text/plain | cse element_en.js | 117 B | 2.73 s |
| collect?v=2&tid=G-KBLBYHG5... | 204 | ping | js?id=G-KBLBYHG | 549 B | 3.49 s |
| collect?v=2&tid=G-KBLBYHG5... | 204 | fetch | js?id=G-KBLBYHG | 550 B | 2.78 s |
| rul?tid=G-KBLBYHG5EP&gacid... | 200 | docum... | | 429 B | 2.68 s |
| collect?v=1&v=j101&aip=1&... | 200 | xhr | analytics.js:36 | 71 B | 412 ms |
| collect?v=1&v=j101&aip=1&... | 200 | xhr | analytics.js:36 | 453 B | 406 ms |
| AdobeStock_164519112.jpg?w... | 200 | webp | vendor.min.js?ver... | 25.9 kB | 885 ms |
| ga-audiences?v=1&t=sr&slf_r... | 200 | gif | (index):3248 | 408 B | 2.13 s |
| 116026588849778?v=2.9.182&... | 200 | script | fbevents.js:128 | 17.8 kB | 1.18 s |
| sdstyle.css | 200 | fetch | content.js:54 | 3.7 kB | 112 ms |
| SdHtmlPage.html | 200 | fetch | content.js:60 | 3.0 kB | 97 ms |
| sdscrip.js | 200 | script | content.js:79 | 26.9 kB | 96 ms |
| icon32.png | 200 | png | content.js:68 | 2.5 kB | 8 ms |
| icon trash.svg | 200 | svg+xml | content.js:70 | 570 B | 8 ms |

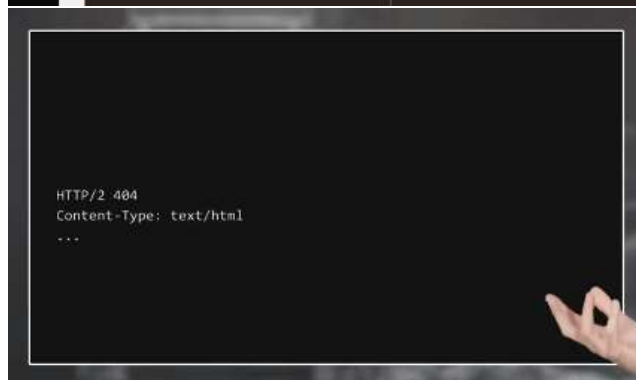
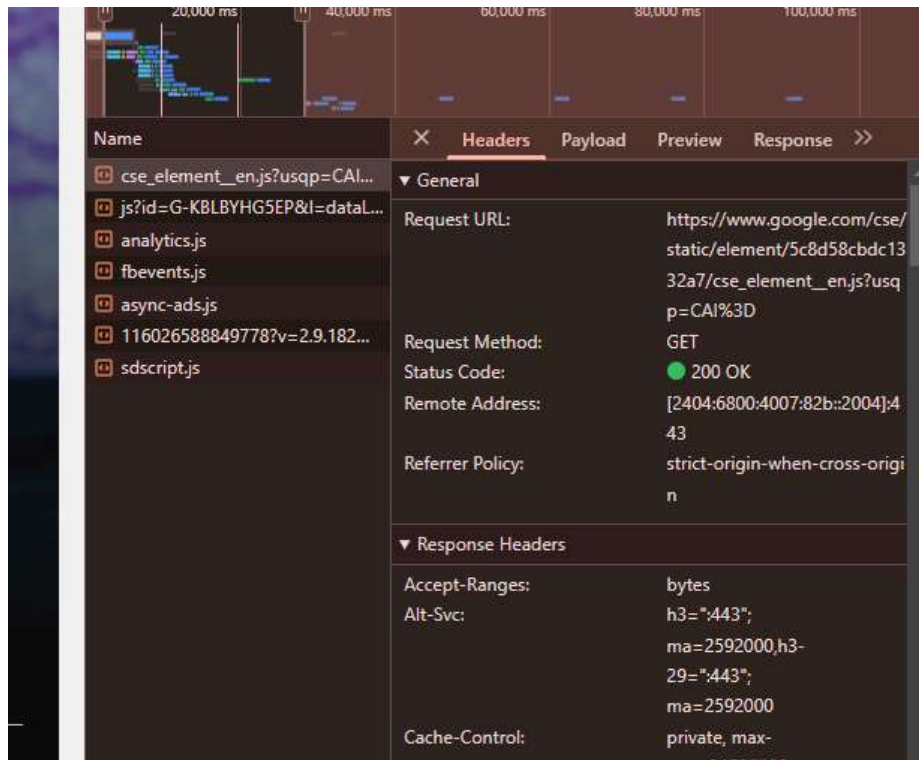
24 requests | 445 kB transferred | 1.3 MB resources

Console AI assistance What's new X

What's new in DevTools 133

See all new features

Highlights of updates from Chrome 130-132





```
200 OK
301 Moved Permanently
302 Found
304 Not Modified
307 Temporary Redirect
401 Unauthorized
403 Forbidden
404 Not Found
418 I'm a Teapot
500 Internal Server Error
503 Service Unavailable
...
```

```
<!DOCTYPE html>

<html lang="en">
  <head>
    <title>
      hello, title
    </title>
  </head>
  <body>
    hello, body
  </body>
</html>
```

Index of /

 (drwxr-xr-x) 23-Oct-2024 10:58 [src8/](#)
 (-rw-----) 23-Oct-2024 14:25 144B [index.html](#)

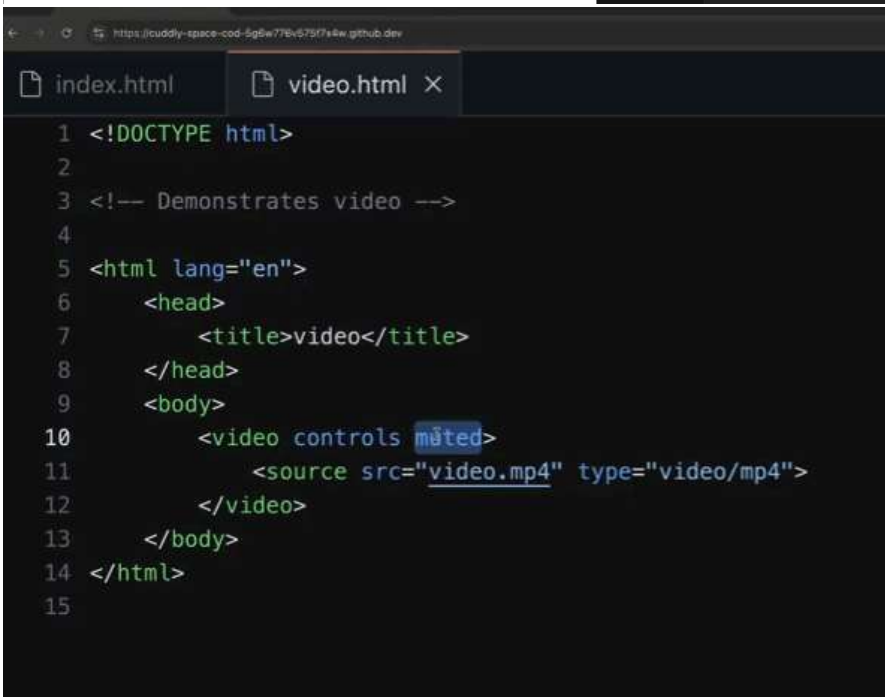
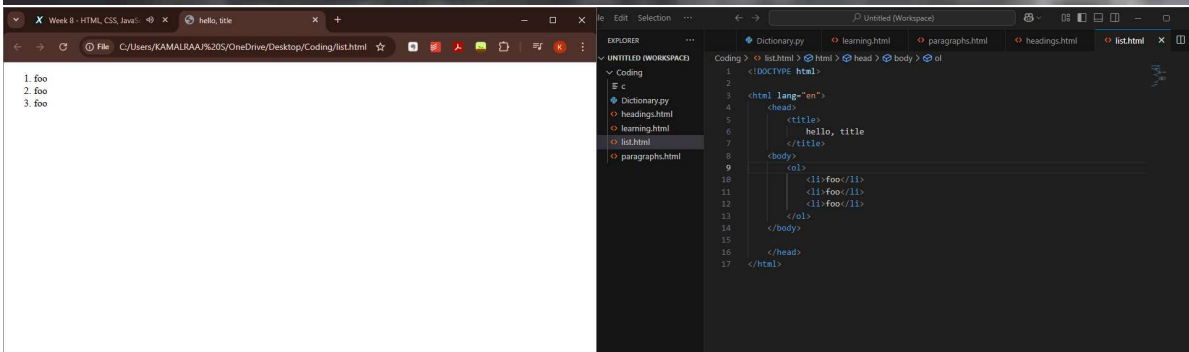
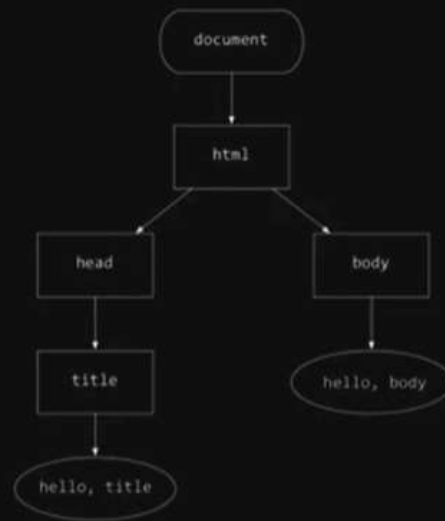
[http-server](#) server running @ localhost:8080

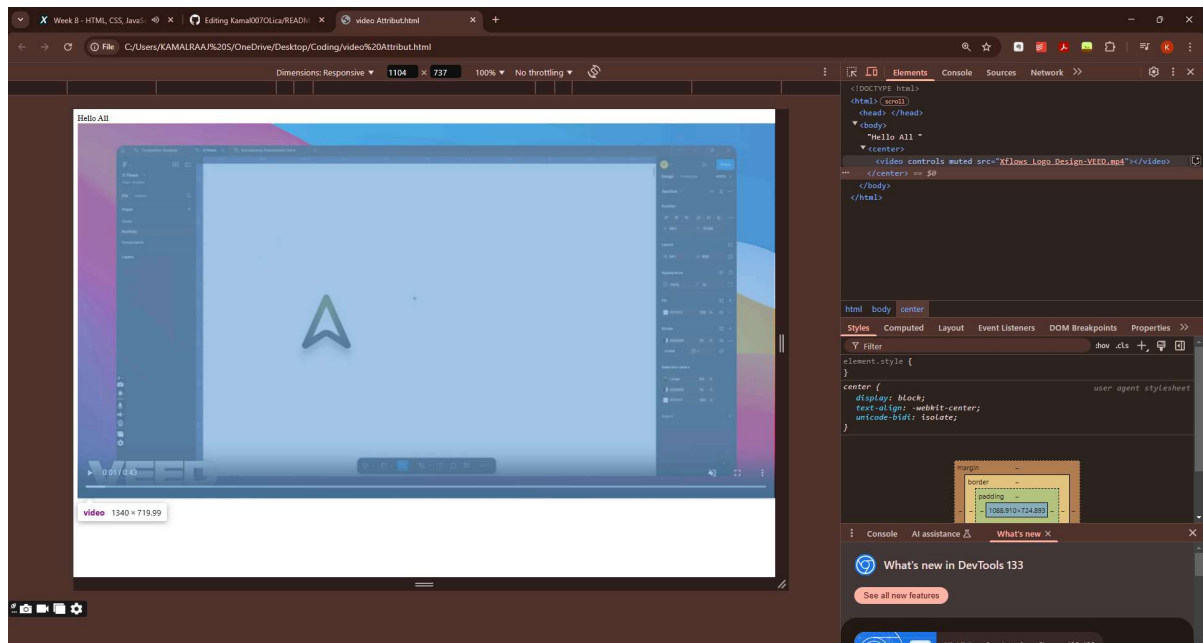
```

<!DOCTYPE html>

<html lang="en">
  <head>
    <title>
      hello, title
    </title>
  </head>
  <body>
    hello, body
  </body>
</html>

```





regexes

- . any single character (except line terminators)
- * zero or more times
- + one or more times
- ? 0 or 1 time
- {n} n occurrences
- {n,m} at least n occurrences, at most m occurrences

...

| | |
|--------------|------------------------------------|
| [0123456789] | any one of the enclosed characters |
| [0-9] | any one of the range of characters |
| \d | any digit |
| \D | any character that is not a digit |
| ... | |

```
mail" pattern=".+@.+\.edu" placeholder="Email"
```

```
ofocus name="phone" pattern="\d{3}-\d{3}-\d{4}" placeholder="Phone Number"
```

CSS

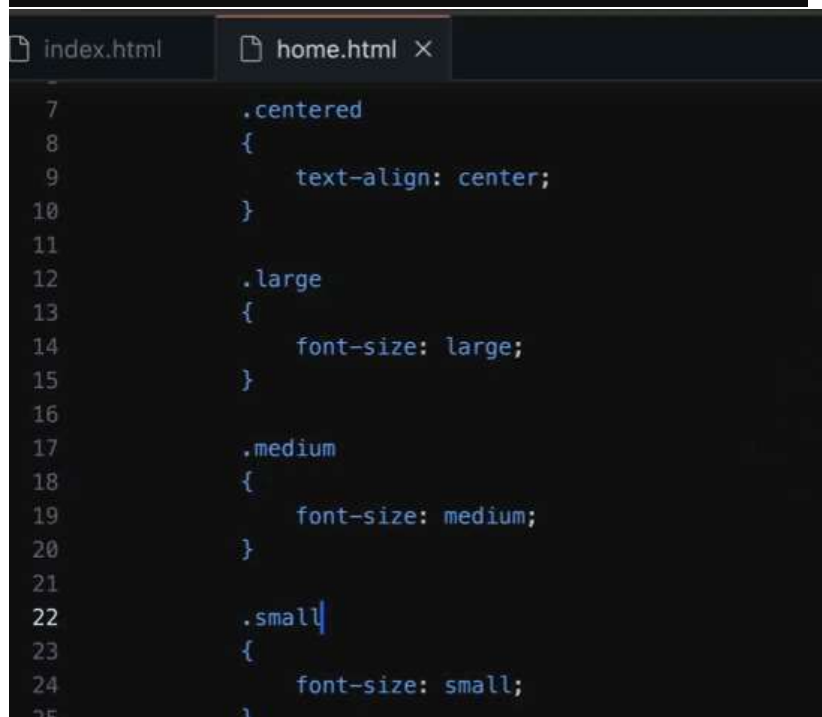
type selector

class selector

ID selector

attribute selector

...



The image shows a code editor with two tabs: 'index.html' and 'home.html'. The 'home.html' tab is active, displaying CSS code. The code defines four class selectors: '.centered', '.large', '.medium', and '.small'. Each selector is followed by a set of curly braces containing a single property: 'text-align: center;' for '.centered', 'font-size: large;' for '.large', 'font-size: medium;' for '.medium', and 'font-size: small;' for '.small'. Line numbers 7 through 25 are visible on the left side of the editor.

```
7      .centered
8      {
9          text-align: center;
10     }
11
12     .large
13     {
14         font-size: large;
15     }
16
17     .medium
18     {
19         font-size: medium;
20     }
21
22     .small
23     {
24         font-size: small;
25 }
```

```

<!DOCTYPE html>

<html lang="en">
  <head>
    <title>
      hello, title
    </title>
  </head>
  <body>
    hello, body
  </body>
</html>

```

```

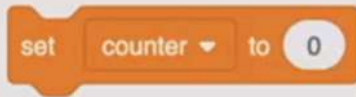
if (x < y)
{
}
else
{
}

```

```

if (x < y)
{
}
else if (x > y)
{
}
else
{
}

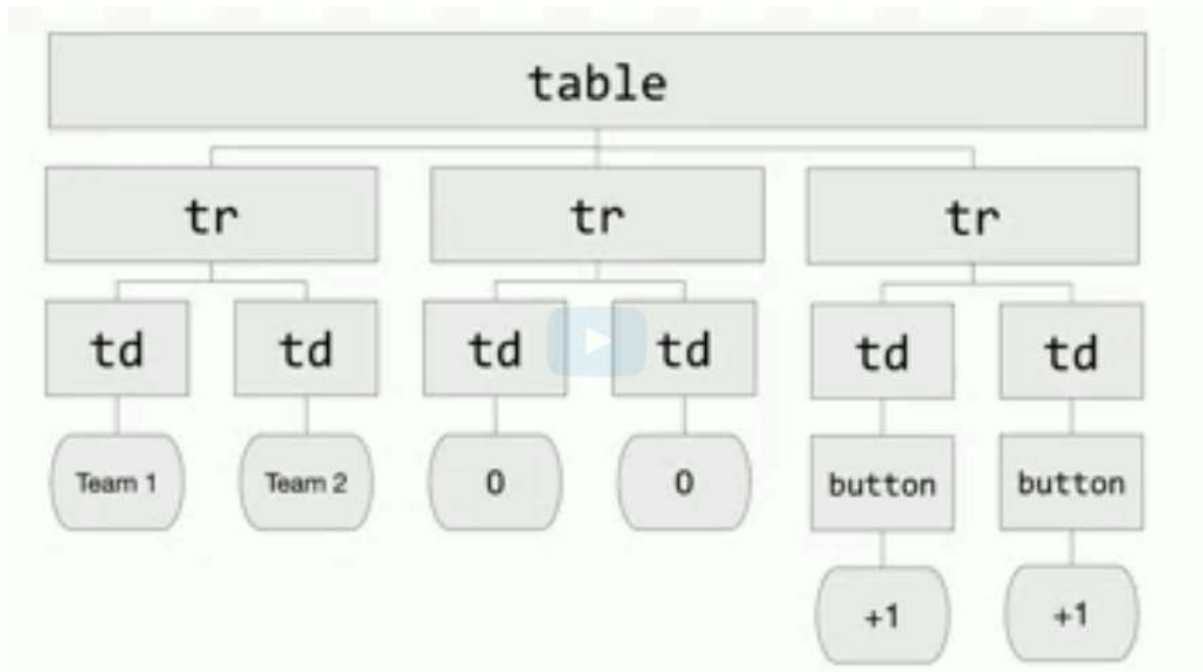
```



```
let counter = 0;
```

```
blur  
change  
click  
drag  
focus  
keyup  
load  
mousedown  
mouseover  
mouseup  
submit  
touchmove  
unload  
...
```





Internet Primer



You



Internet

Internet Primer

- **IP Address**

- In recent years, we've been slowly phasing out this old scheme (IPv4) and replacing it with a newer scheme (IPv6) that assigns computers 128-bit addresses, instead of 32-bit addresses.

340,282,366,920,938,463,463,374,607,431,768,211,456

Internet Primer

- **IPv6 Address**

s:t:u:v:w:x:y:z

- Each of s, t, u, v, w, x, y, and z is represented by 1 to 4 hexadecimal digits in the range [0, ffff].

Internet Primer

- **DNS**

- Odds are, you've never actually tried to visit a website by typing its IP address into your browser.
- The Domain Name System (DNS) exists to help us translate IP addresses to more memorable names that are more human-comprehensible.
- In this way, DNS is somewhat like the yellow pages of the web.

Internet Primer

- DNS

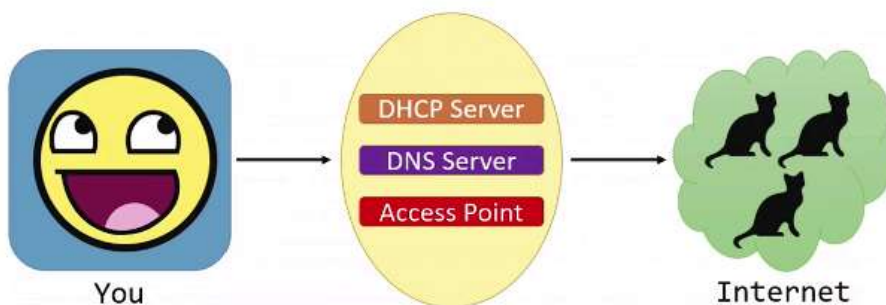
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Internet Primer

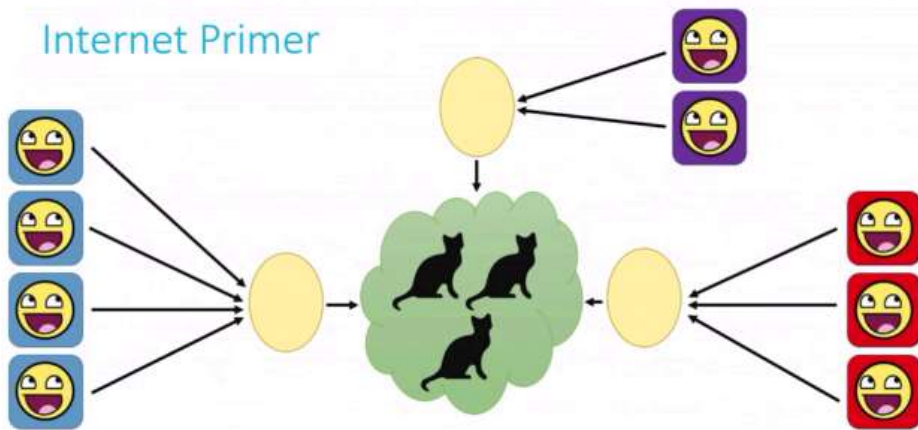
- DNS

| Host | IPv4 Address |
|----------------------|-----------------|
| info.host1.net | 0.0.0.0 |
| info.host2.net | 0.0.0.1 |
| ... | |
| io-in-f138.1e100.net | 74.125.202.138 |
| ... | |
| info.hostn-1.net | 255.255.255.254 |
| info.hostn.net | 255.255.255.255 |

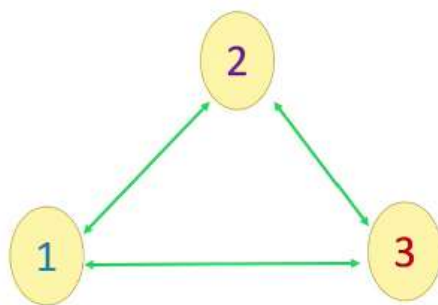
Internet Primer



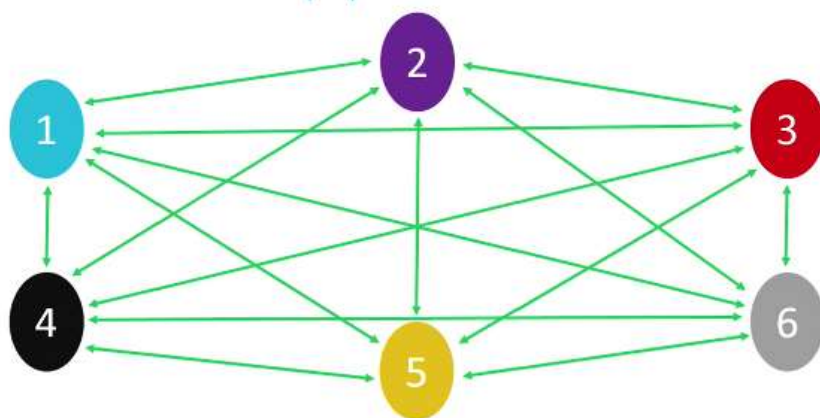
Internet Primer



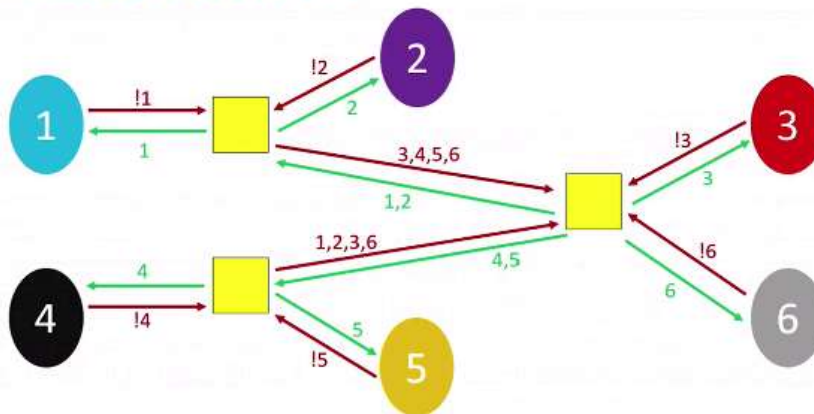
Internet Protocol (IP)



Internet Protocol (IP)

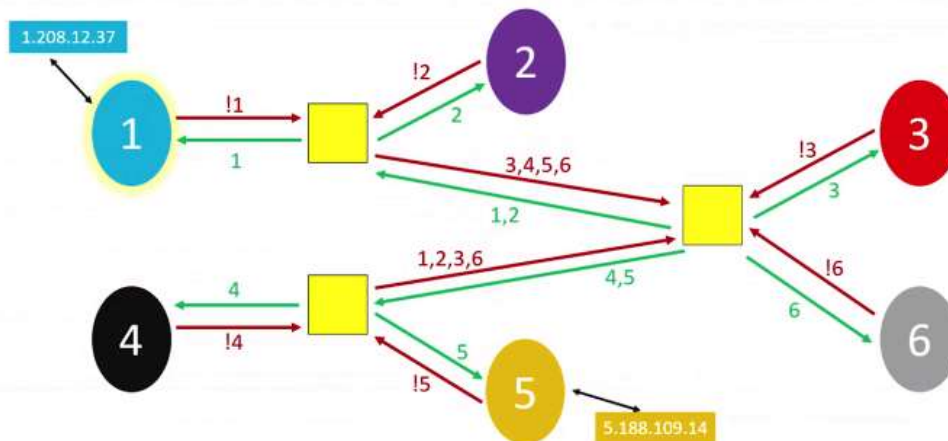


Internet Protocol (IP)



From: 1.208.12.37
To: 5.188.109.14

Internet Protocol (IP)



Transmission Control Protocol (TCP)

- Some ports are so commonly used that they have been standardized across all computers.
 - FTP (file transfer) uses port **21**.
 - SMTP (e-mail) uses port **25**.
 - DNS uses port **53**.
 - HTTP (web browsing) uses port **80**.
 - HTTPS (secure web browsing) uses port **443**.

Hypertext Transfer Protocol (HTTP)



Hypertext Transfer Protocol (HTTP)

| Class | Code | Text | Comments |
|--------------|------|-------------------|---|
| Success | 200 | OK | All is well, valid request and response. |
| Redirection | 301 | Moved Permanently | Page is now at a new location, automatic redirects built in to most browsers. |
| | 302 | Found | Page is now at a new location <i>temporarily</i> . |
| Client Error | 401 | Unauthorized | Page typically requires login credentials. |
| | 403 | Forbidden | Server will not allow this request. |

CSS

• Common CSS properties

- **border:** style color width
 - Applies a border of the specified color, width, and style (e.g., dotted, dashed, solid, ridge...).
- **background-color:** [keyword | #<6-digit hex>]
 - Sets the background color. Some colors are pre-defined in CSS.
- **color:** [keyword | #<6-digit hex>]
 - Sets the foreground color (usually text).

JavaScript

- JavaScript is a modern programming language that is derived from the syntax at C.
- It has been around just about as long as Python, having been invented a few years later, in 1995.
- JavaScript, HTML, and CSS make up the three languages defining most of the user experience on the web.

JavaScript

• Variables

- JavaScript variables are similar to Python variables.
 - No type specifier.
 - When a local variable is first declared, preface with the var keyword.

```
var x = 44;
```

JavaScript

• Objects

```
struct car
{
    int year;
    char model[10];
}
```

- C structures contain a number of *fields* or *members*, which we might also call *properties*.
 - But the properties themselves can not ever stand on their own.

```
struct car herbie;
year = 1963;
model = "Beetle";
```

JavaScript

- **Loops (redux)**

- How do we iterate across all of the key-value pairs of an object (or indeed, all of the elements of an array)?

```
for (var key in object)
{
    // use object[key] in here
}
```

Document Object Model

- As we've seen, JavaScript objects are incredibly flexible, and can contain various fields, even when those fields are other objects.
- The *document object* is one way of employing this paradigm, whereby that object organizes the entire contents of a web page.
- By organizing an entire page into a JavaScript object, we can manipulate the page's elements programmatically.

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Document Object Model

• DOM Methods

| DOM Method | Description |
|-------------------------------------|---|
| <code>getElementById(id)</code> | Gets the element with a given ID below this point in the DOM. |
| <code>getElementsByName(tag)</code> | Gets all elements with the given tag below this point in the DOM. |
| <code>appendChild(node)</code> | Add the given node to the DOM below this point. |

