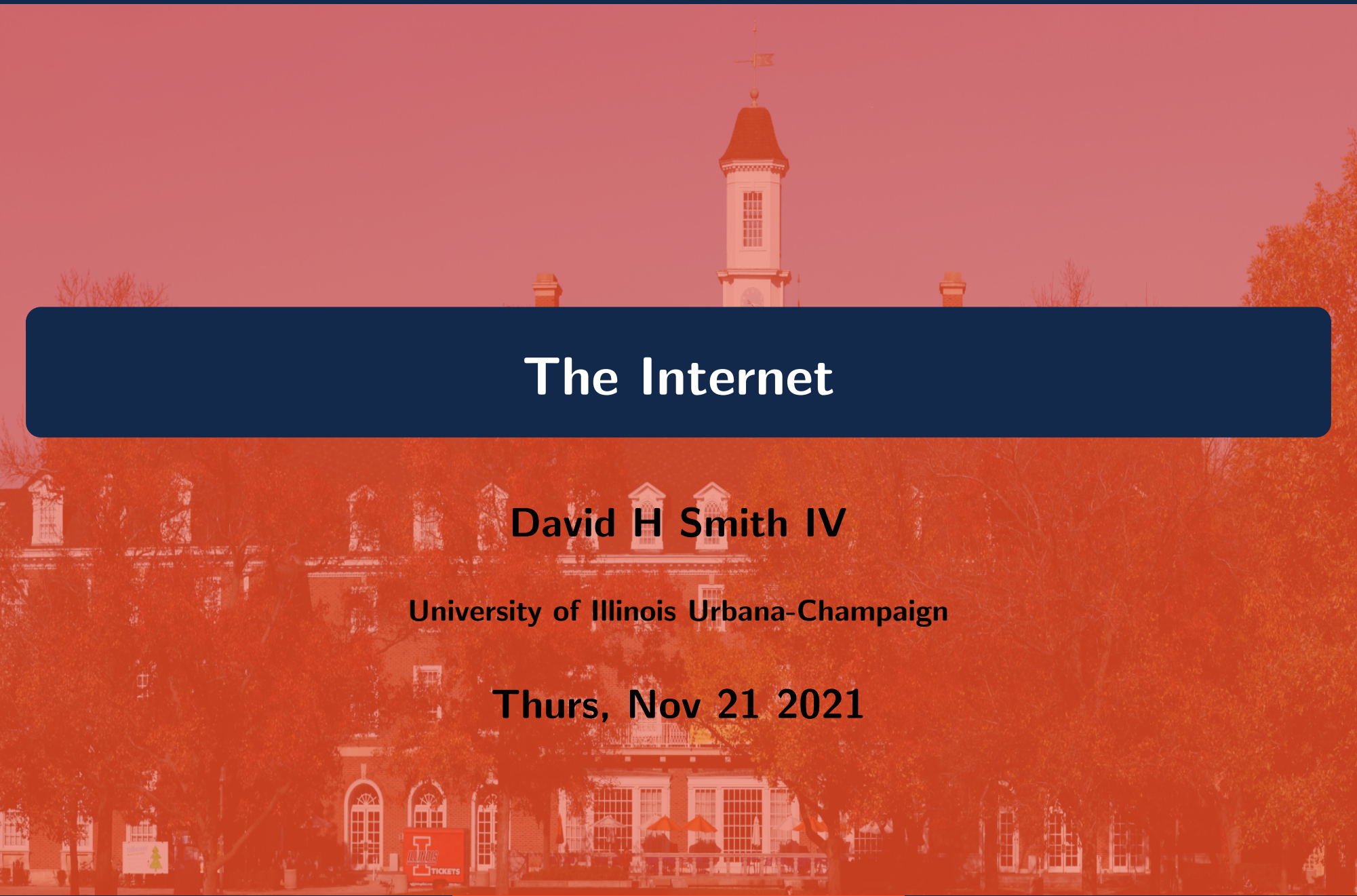

The Internet

David H Smith IV

University of Illinois Urbana-Champaign

Thurs, Nov 21 2021

Reminders

Reminders

Things that are due tomorrow:

- Homework 12
- Game of Life
- Participation 13p1
- Post-reading 13p1

Why we care

Where Data Comes From

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2. Then we got data from the user: `input()`

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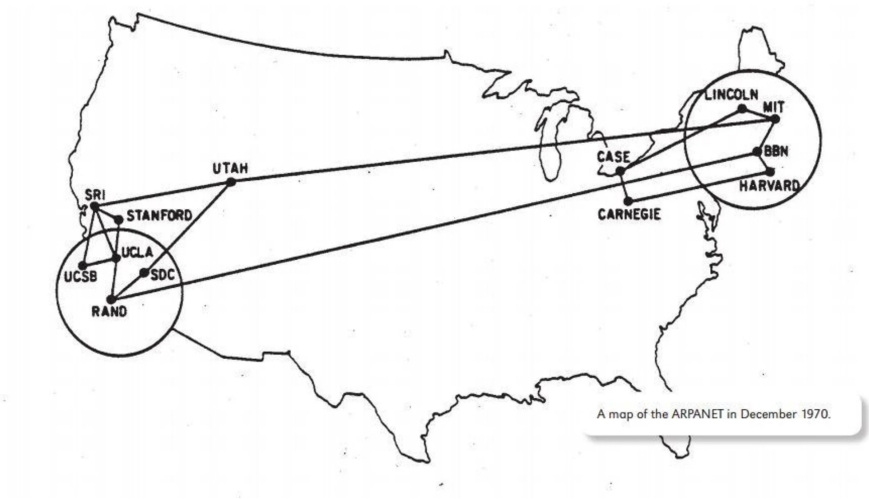
2. Then we got data from the user: `input()`
3. Then we got it from files: `open(filepath)`.
4. Now, we can get it from the internet. The world's biggest file collection.
   - Recall, websites are just collections of files on another person's computer (server):

```
dev_website
|---index.html
|___elements
    |--- about.html
    |--- cv.html
    |___ projects.html

```

History of the Internet

ARPANET



A map of the ARPANET in December 1970.

- Only a few users at government research facilities and universities
- Used for file transfer, not websites
- File Transfer Protocol (FTP, 1971) is still available and used today.
- Example:

Tim Berners-Lee and the Internet

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    - Proposed a hypothetical machine that could let a user jump to different locations across multiple documents. Sound familiar?
  - A browser, which could read and render the files.

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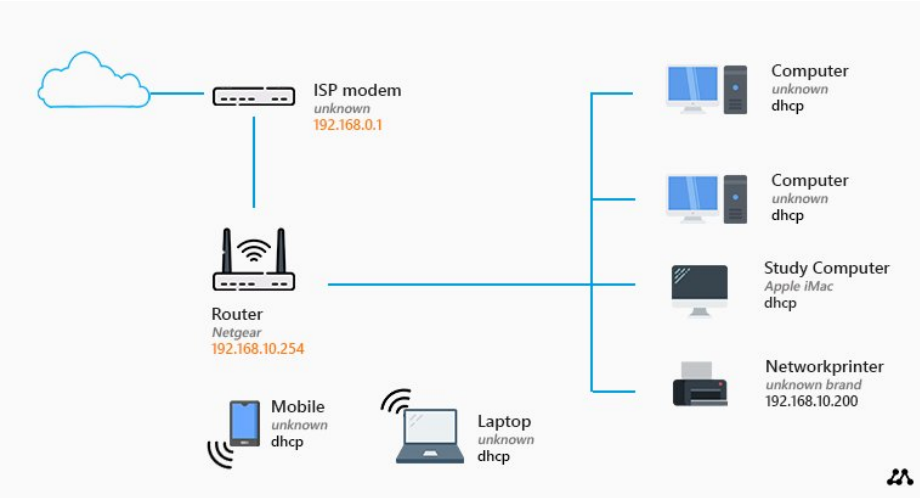
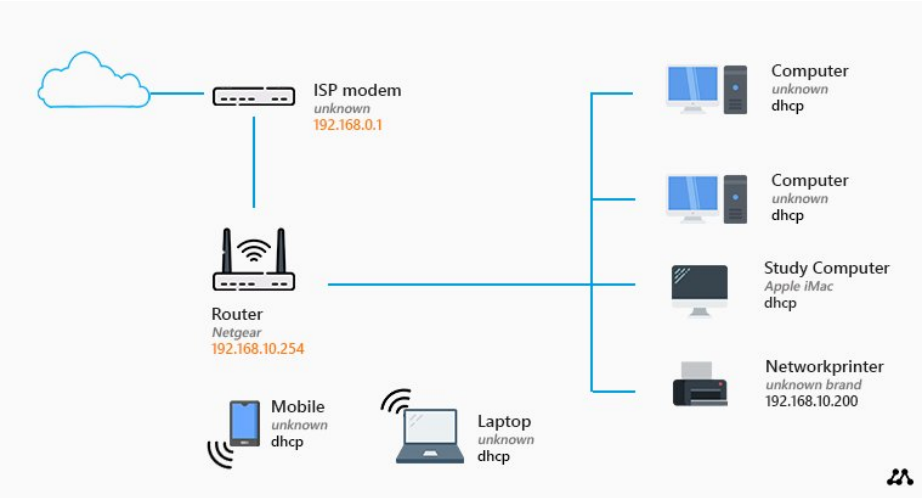
  - A browser, which could read and render the files.
  - A set of rules (protocol), for transferring these files (HTTP).

Networks


ISP modem
unknown
192.168.0.1
Router
Netgear
192.168.10.254
Mobile
unknown
dhcp
Laptop
unknown
dhcp
Computer
unknown
dhcp
Computer
unknown
dhcp
Study Computer
Apple iMac
dhcp
Networkprinter
unknown brand
192.168.10.200

Networks



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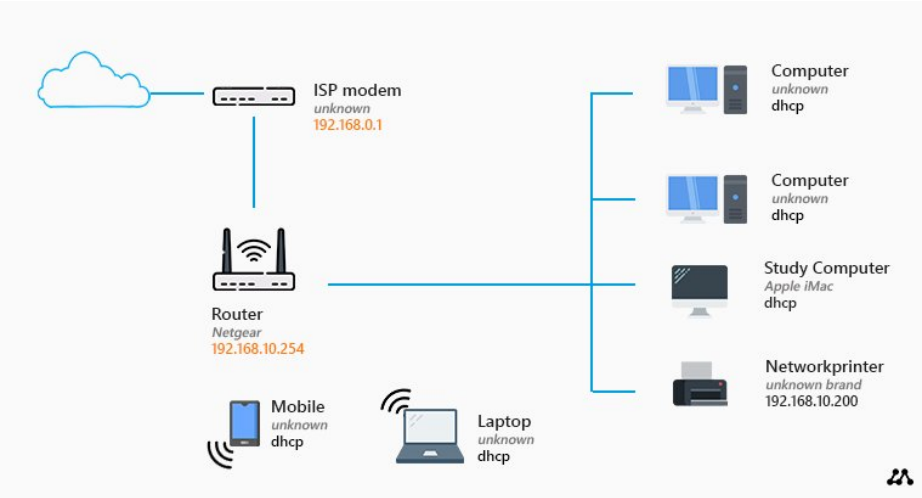
Networks



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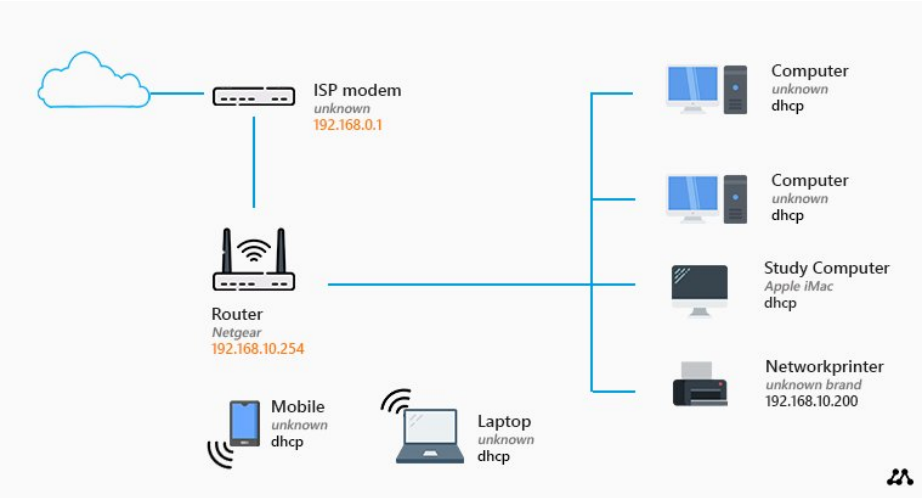
Networks



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- Router $\rightarrow$ Route data/traffic between networks.
- Modem $\rightarrow$ (1) Stands for "modulation-demodulation" (2) Converts between analog (waves) and digital (10101011101).

The early internet

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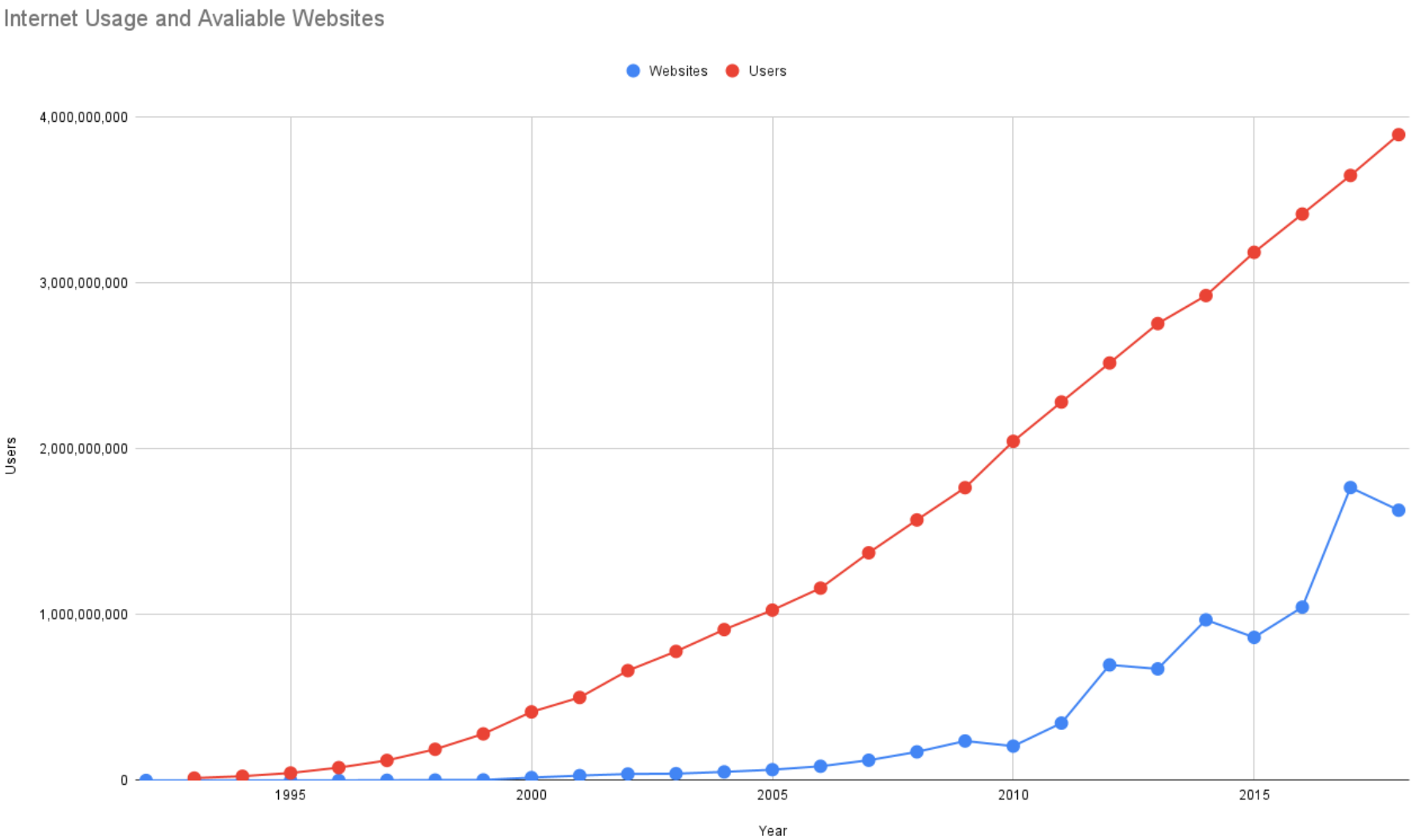
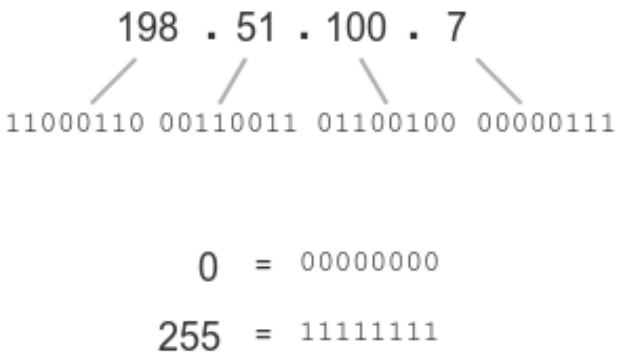
- Internet Relay Chat (IRC) $\rightarrow$ An early instant messaging system that allowed someone to use a IRC client program to connect to a server and chat.

Internet Usage



IP Addresses, Domain Names, and URLS

IP Addresses



- Internet Protocol (IP) Address $\rightarrow$ The 32 bit (four 8-bit groups) address that specifies.
- Goes from 0.0.0.0-255.255.255.255
- Each domain name (e.g., www.google.com) has an IP address
- We use a Domain Name System (DNS) server to lookup the IP attached to a domain name

Domain Names

- Levels of Domains:
  - Top-Level Domain (TLD): .com, .edu, .net, .org
  - Country Code Top-Level Domain (ccTLD): .uk, .ru, .ca
  - Second-Level Domain: google, wikipedia, youtube
  - Sub-Domain: sub-domain(s) that fall under the second level domain.
  - For example, if the top and second-level domain is illinois.edu:
    - cs.illinois.edu
    - law.illinois.edu

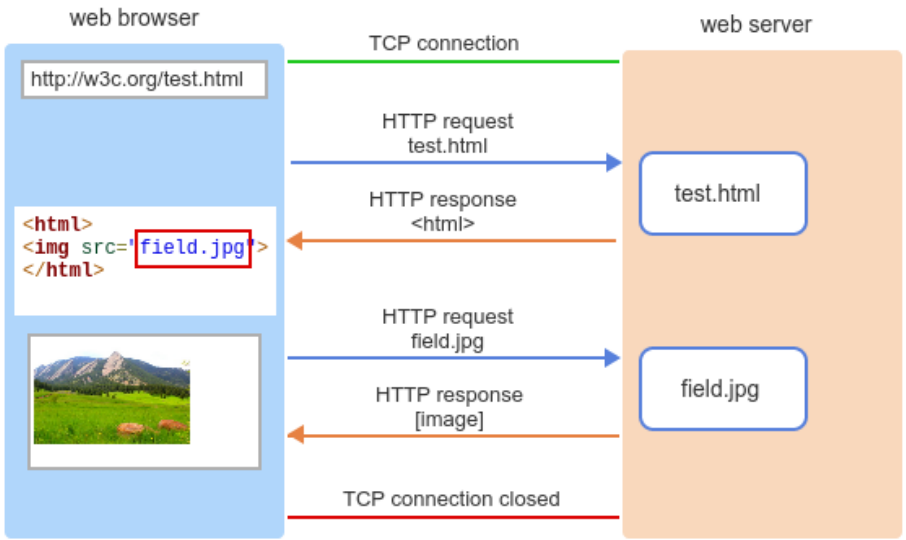
URLS

The Uniform Resource Locator (URL) is composed of the following parts:

- **Protocol Scheme** $\rightarrow$ The protocol that is being used
- **Hostname** $\rightarrow$ The complete domain name of the server you're trying to connect to.
- **Path** $\rightarrow$ The path to the resource and (sometimes) query parameters.

HTTP Protocol

HTTP Basics



- **GET** $\rightarrow$
- **HEAD** $\rightarrow$
- **POST** $\rightarrow$
- **PUT** $\rightarrow$
- **DELETE** $\rightarrow$

Reading data from the internet

```
1 import requests
2
3 response = requests.get("https://www.google.com")
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Lets try this on PrairieLearn :D