



Internet & WWW

A brief introduction



What is the Internet and the World Wide Web?



What is the Internet?

“A diverse set of independent networks, interlinked to provide its users with the appearance of a single, uniform network.”



A very short history of the Internet

- 1957: USSR launches Sputnik
- 1958: Department of Defense: **A**dvanced **R**esearch **P**rojects **A**gency (ARPA)
- ARPAnet: online in 1969
 - centralized > decentralized > distributed network
 - packet switching (message broken up into chunks, then rearranged at its destination)
- 1973-74: rules for networks to communicate (TCP/IP)
 - the term “Internet” is coined
- 1983: TCP/IP adopted across ARPAnet > birth of the modern Internet



*...the other small step
for mankind...*

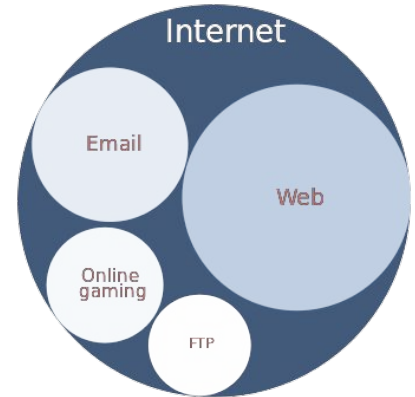
“A diverse set of independent networks, interlinked to provide its users with the appearance of a single, uniform network.”

So, what is the World Wide Web?

That's what most people think of when they see the term "internet"

"The Web is an abstract (imaginary) space of information. On the Net, you find computers -- on the Web, you find document, sounds, videos,... information. On the Net, the connections are cables between computers; on the Web, connections are hypertext links..."

Sir Tim Berners-Lee



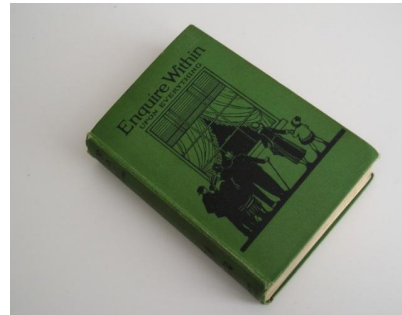
The World Wide Web

- Origins: 1963: concept of hypertext as “nonsequential writing”

- WWW invented by Tim Berners-Lee

The invention of the WWW is attributed to the British **Tim Berners-Lee**, who, along with the Belgian Robert Cailliau, published a proposal in **1990** for a hypertext system while both were working at CERN in Switzerland.

1. Implemented the idea of hypertext
2. Created the World Wide Web
3. Gave the software away for free



This growth was very much facilitated by the decision of CERN to not patent the work and ideas done by its employee and instead left the web protocols and code-base royalty free.



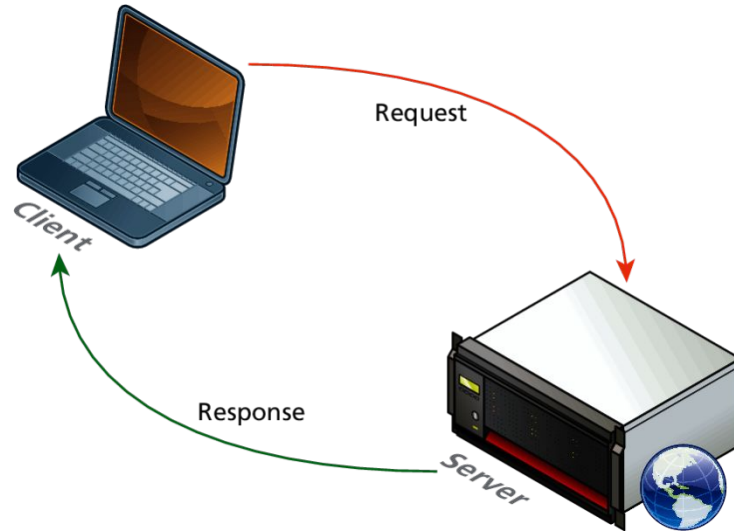
1994: Berners-Lee helps found the **World Wide Web Consortium** (W3C), the international standards organization that oversees the growth of the web.

Major Components of the Web

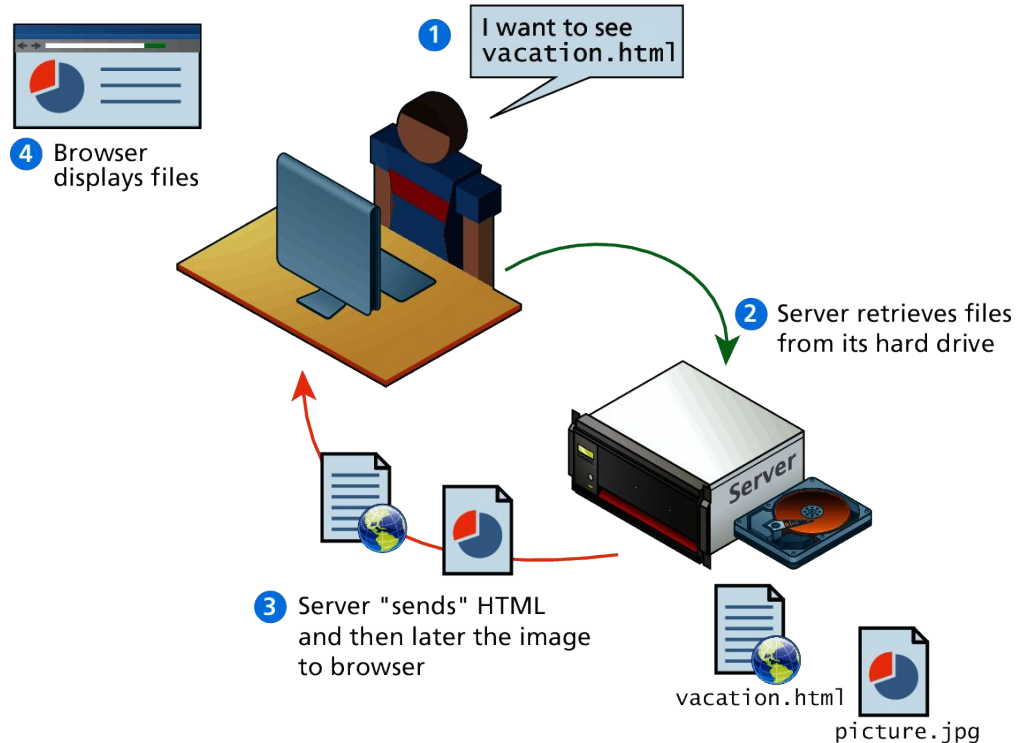
1. **URL** (uniform resource locator)
a unique address to identify a resource on the Web
2. **HTTP**: hypertext transfer protocol
a set of rules than enable a client (your local computer) to communicate with a server (a remote computer)
3. **A web server**
A program that resides on the server (the term server can refer to both, the machine and the software that resides on it and is responsible for handling client requests)
4. **A web browser**
A program that resides on the client, is capable of making requests to the server based on the provided URL, and then displays the HTML it receives from the server.
5. **HTML**: hypertext markup language
The markup language used to describe the content of a web page

How the Web works: Client-Server Model

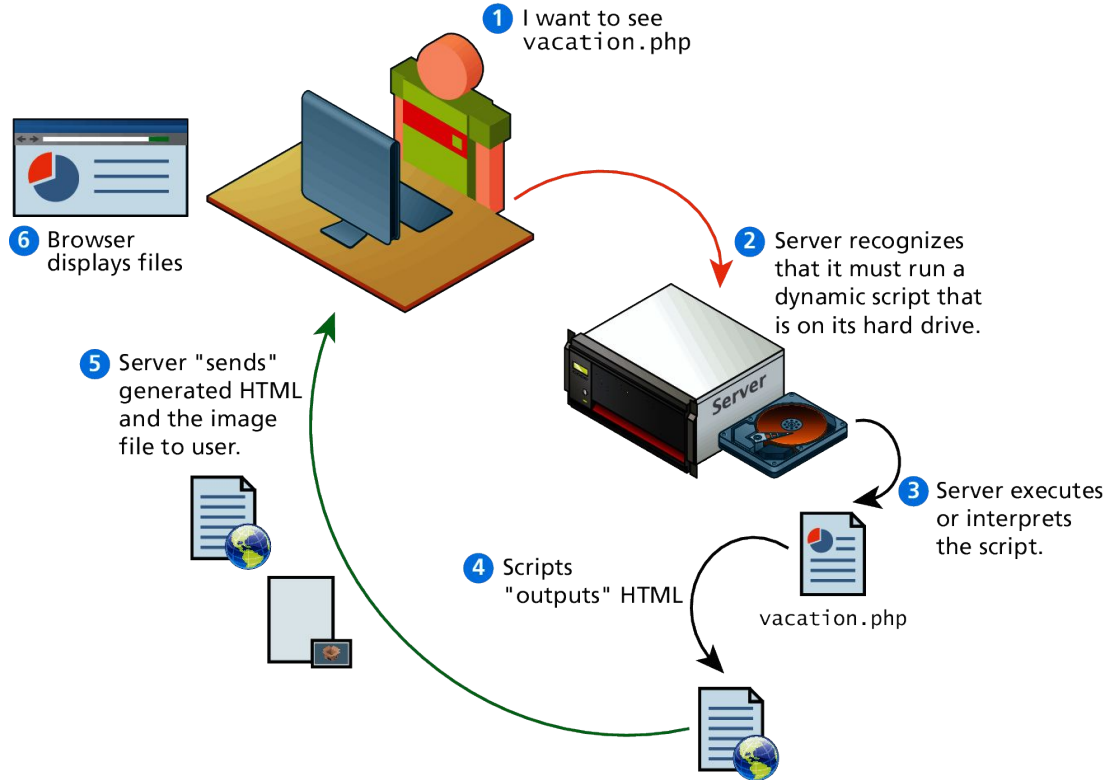
How web pages are delivered to your browser screen:



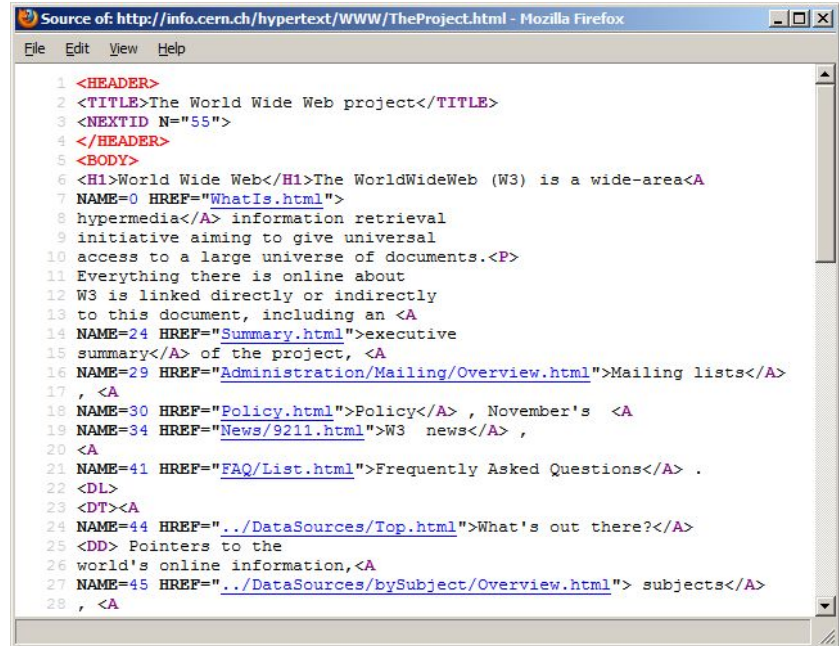
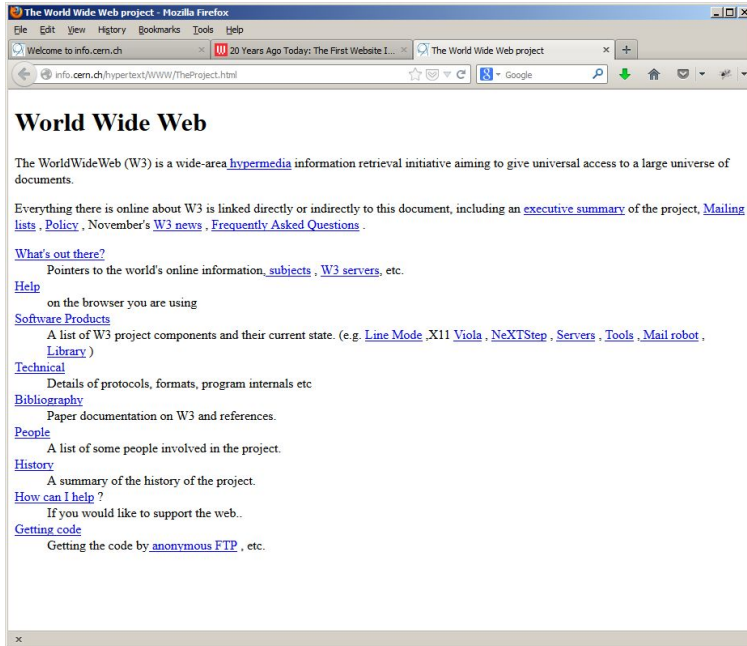
Static Web Sites: web files located on the server



Dynamic Web Sites: files generated by the server



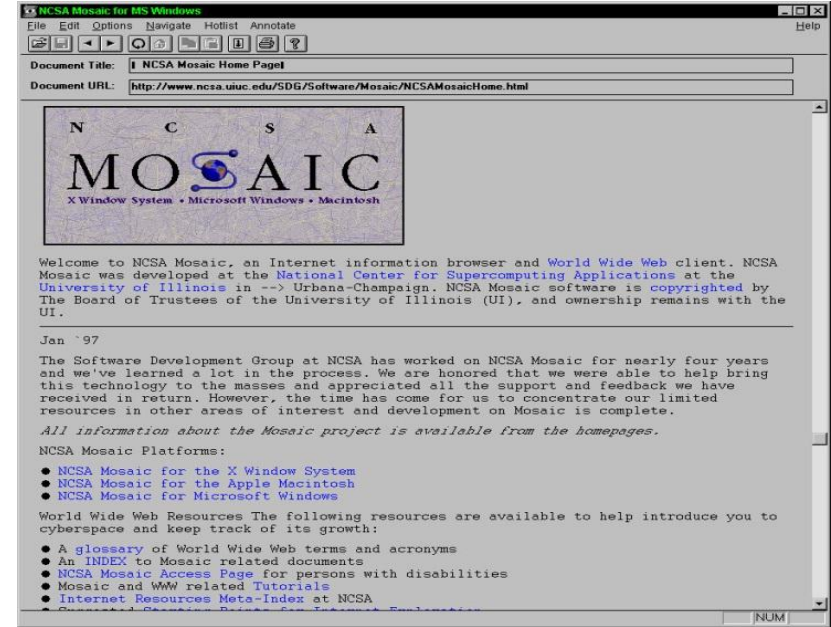
First Webpage: 1991



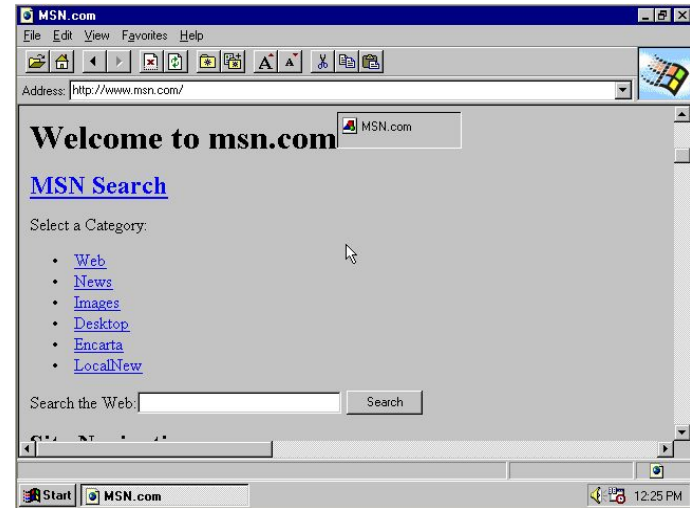
<http://info.cern.ch/hypertext/WWW/TheProject.html>

'Ancient" web pages

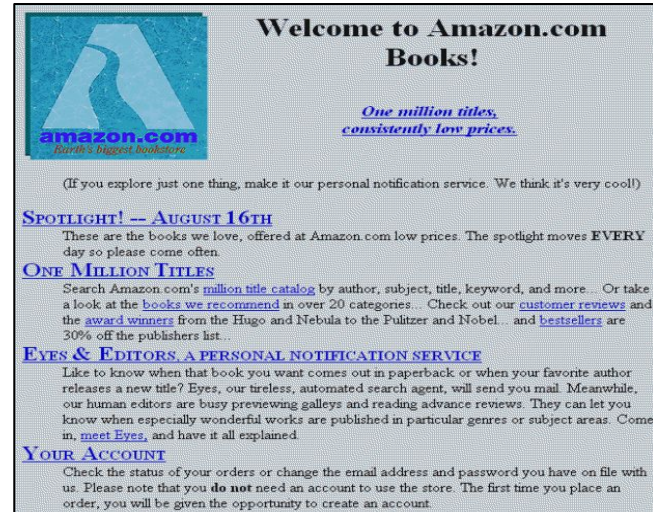
The very first browser: Mosaic (1993)
(by Mark Andreessen and Eric Bina at U of Illinois)



'Ancient" web pages



'Ancient" web pages



Our “tech” focus

- **HTML (Hypertext Markup Language)** for structure
 - text, lists, tables, forms, images links, etc...

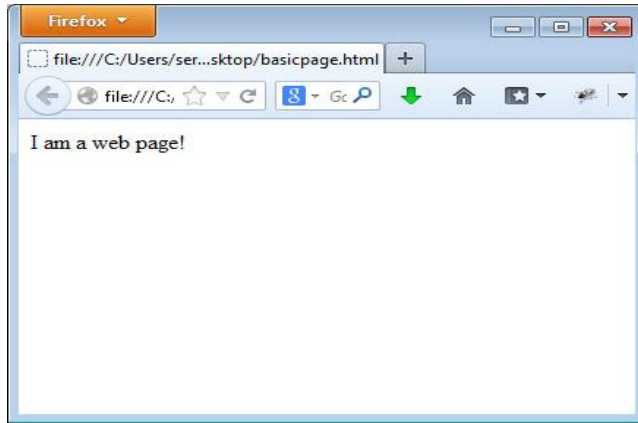
```
<p>I am a paragraph!
```

- **CSS (Cascading Style Sheets)** for presentation
 - format, layout, font size, font face, border width, background color, etc...

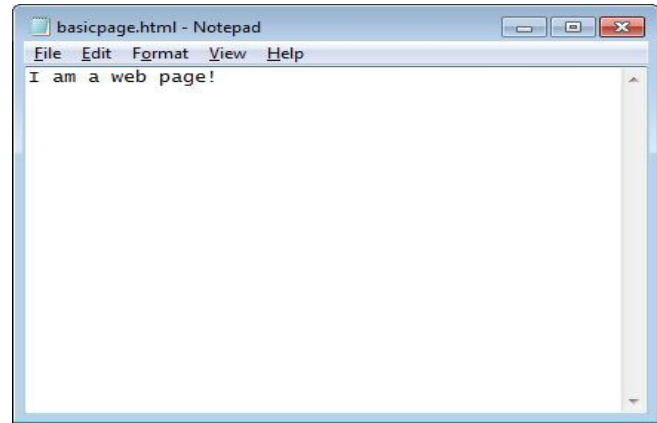
```
p {  
    color: gray;  
    font-weight: bold;  
}
```


On to building websites!

- What is a web page?
 - It's just a plain text file!



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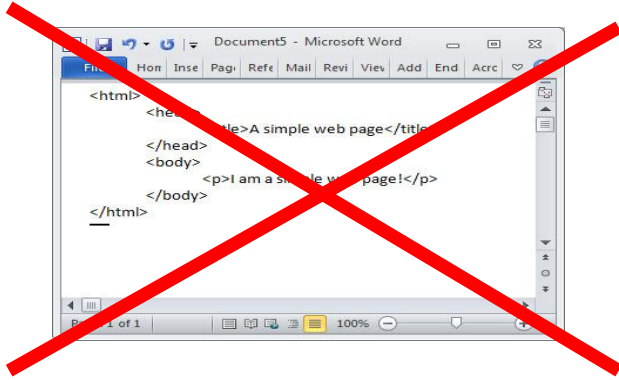
How to Create Web Pages

You can create a web page using any text editor
(Notepad, Notepad++, TextEdit, TextWrangler, Brackets, etc...)

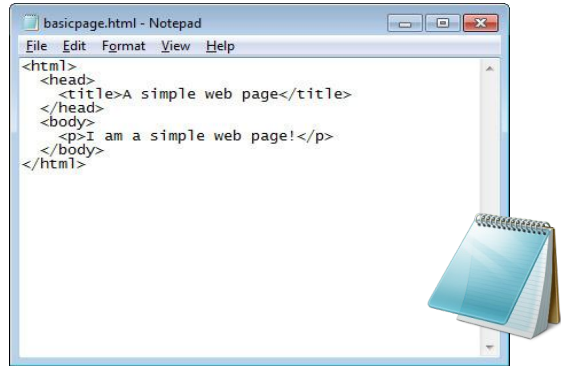
Do NOT use a word processor (Microsoft Word)

Do select plain text format (NOT rich text format)

How to Create Web Pages



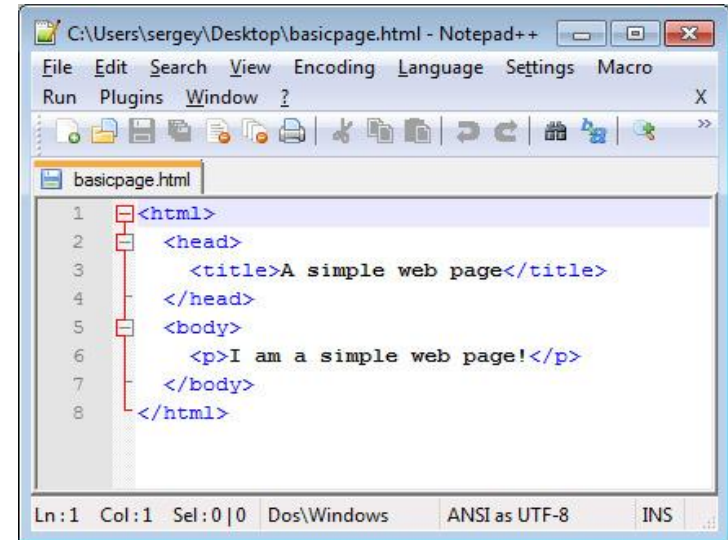
Never, use a word processor (or rich text format in an editor)!



Notepad is a very basic choice: it will get the job done, but you can use something much better

Editing Web Pages

A much better choice: Notepad++
(or any other text editor – most will support HTML)

A screenshot of the Notepad++ application window. The title bar shows the file path "C:\Users\sergey\Desktop\basicpage.html - Notepad++". The menu bar includes File, Edit, Search, View, Encoding, Language, Settings, Macro, Run, Plugins, and Window. The toolbar contains various icons for file operations and editing. The main text area shows the following HTML code:

```
1 <html>
2   <head>
3     <title>A simple web page</title>
4   </head>
5   <body>
6     <p>I am a simple web page!</p>
7   </body>
8 </html>
```

The status bar at the bottom indicates "Ln: 1 Col: 1 Sel: 0 | 0 Dos\Windows ANSI as UTF-8 INS".



Internet & WWW

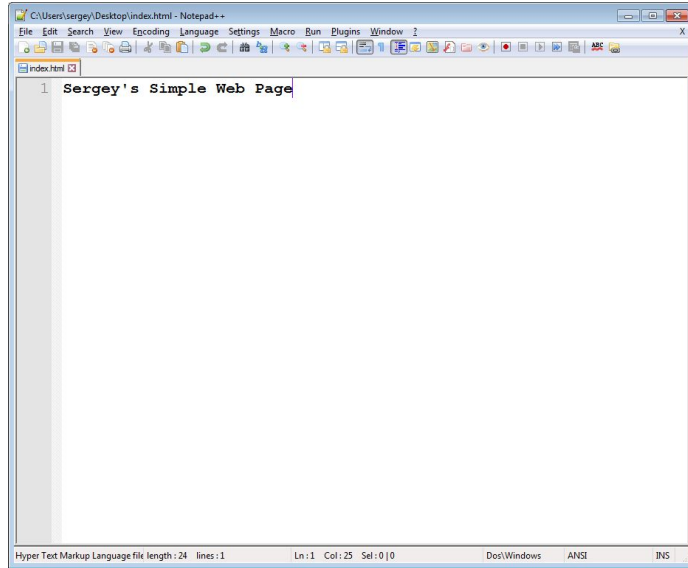
Exercise: On to building web pages!



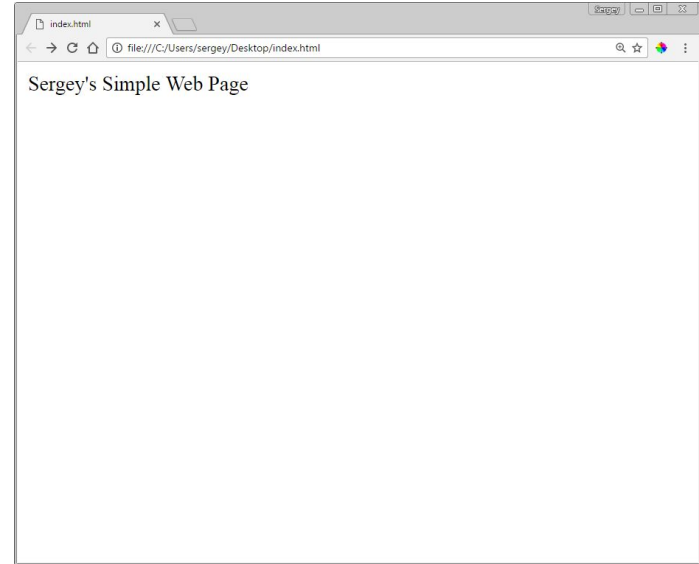
Exercise Part 1: Create a web page

1. Create new folder (any name OK)
2. In this folder, create a blank text file: index.html
(make sure you did not create index.html.txt)
3. Open your file in Notepad++ or TextEdit
4. Add some content (feel free to add plain text, or copy the HTML from the example used in class)
5. Save the file and open it in Firefox or Chrome or Safari or any other Internet browser
6. Congratulations - you have a web page!

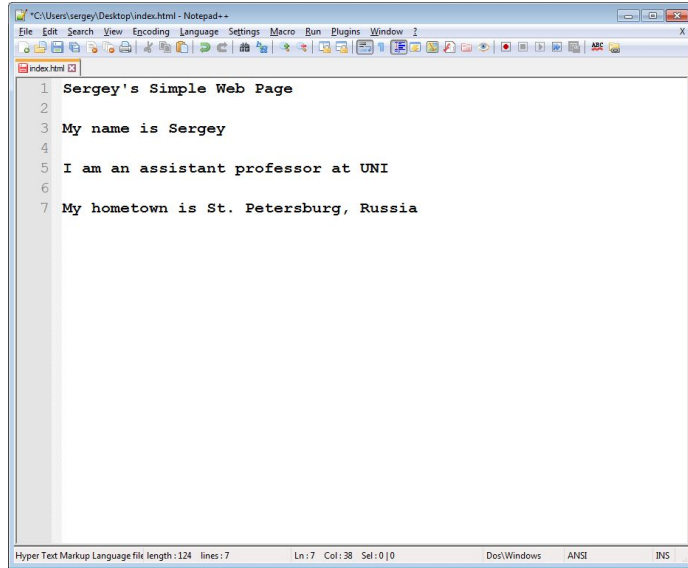
Let's make a basic web page



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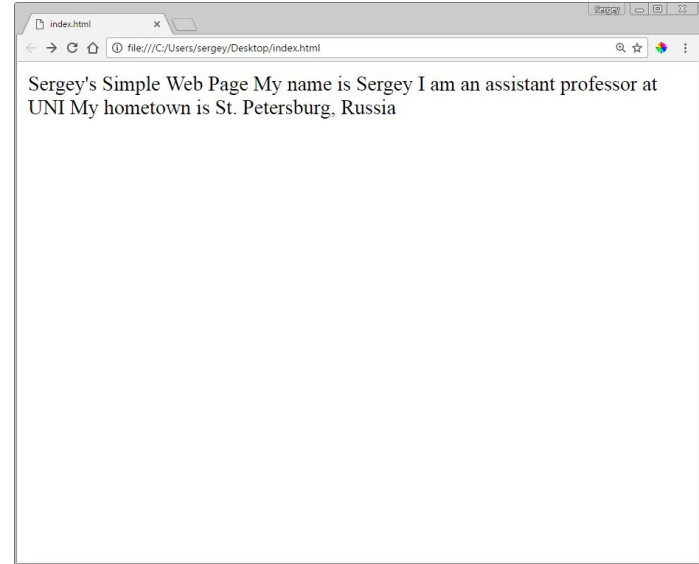
Now add more text



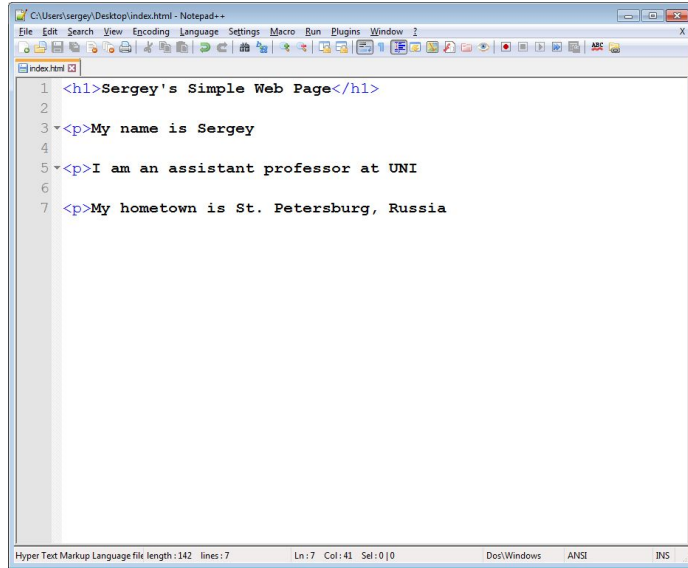
```
1 <h1>Sergey's Simple Web Page</h1>
2
3 <p>My name is Sergey</p>
4
5 <p>I am an assistant professor at UNI</p>
6
7 <p>My hometown is St. Petersburg, Russia</p>
```

Hyper Text Markup Language file: length: 124 lines: 7 Ln: 7 Col: 38 Sel: 0 | 0 Dos/Windows ANSI INS

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Now add some formatting



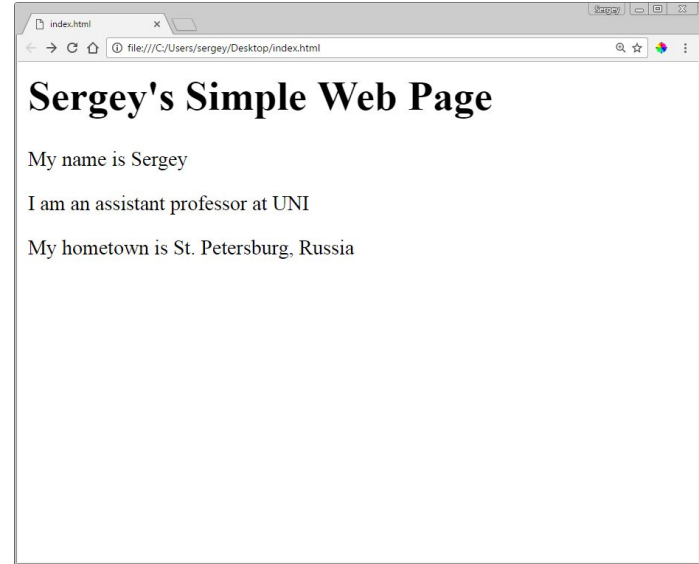
```
1 <h1>Sergey's Simple Web Page</h1>
2
3 <p>My name is Sergey
4
5 <p>I am an assistant professor at UNI
6
7 <p>My hometown is St. Petersburg, Russia
```

The screenshot shows a Notepad++ window with the file path C:\Users\sergey\Desktop\index.html. The code is as follows:

```
1 <h1>Sergey's Simple Web Page</h1>
2
3 <p>My name is Sergey
4
5 <p>I am an assistant professor at UNI
6
7 <p>My hometown is St. Petersburg, Russia
```

The status bar at the bottom indicates: Hyper Text Markup Language file: length: 142 lines: 7 Ln: 7 Col: 41 Sel: 0 | 0 Dos/Windows ANSI INS

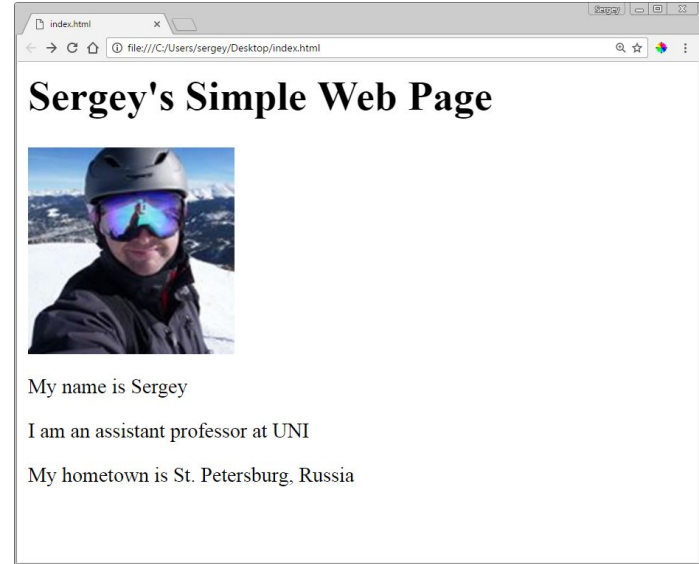
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..And a picture!

Save a picture of yourself as "[me.jpg](#)" into the folder that contains your [index.html](#) file.

```
C:\Users\sergey\Desktop\index.html - Notepad++
File Edit Search View Encoding Language Settings Macro Run Plugins Window ?
index.html
1 <h1>Sergey's Simple Web Page</h1>
2
3 <p>
4
5 <p>My name is Sergey
6
7 <p>I am an assistant professor at UNI
8
9 <p>My hometown is St. Petersburg, Russia
Hyper Text Markup Language file: length: 167 lines: 9 Ln: 3 Col: 22 Sel: 0 | 0 Dos/Windows ANSI INS
```

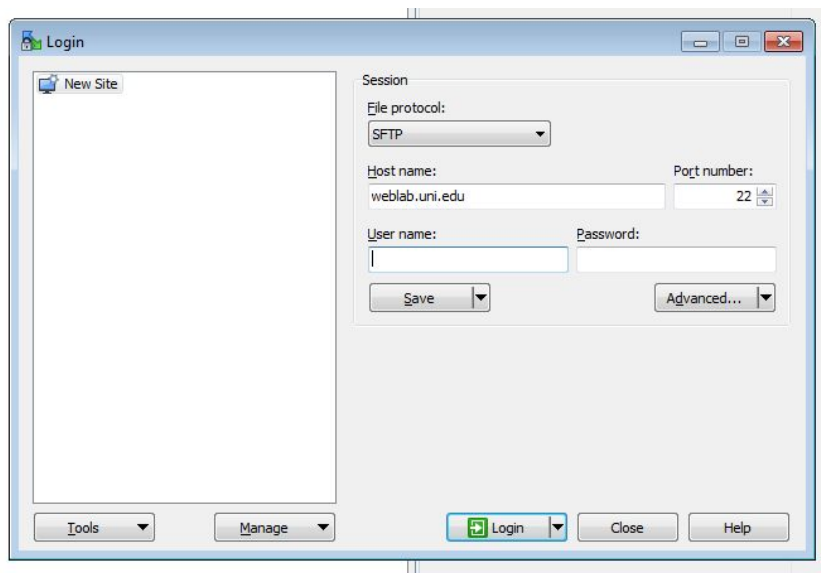


Exercise Part 2: Publish your web page

- To view your web page online, you need to upload your files to a web server - for which you need a special program
- I recommend WinSCP (for Windows) or Cyberduck (for Macs)
- Configuration settings are the same for any such program

Configuring WinSCP

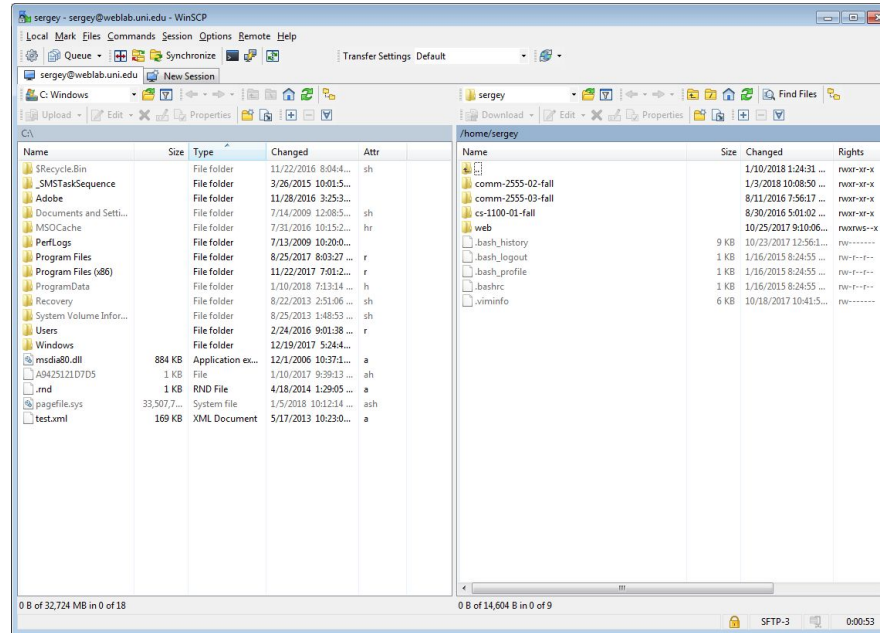
You need to fill out:



host name: **weblab.uni.edu**

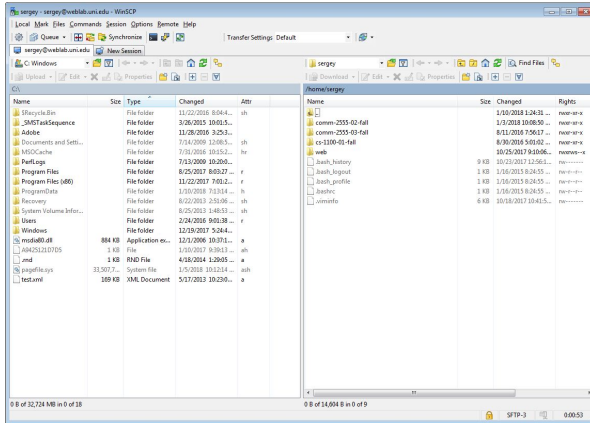
username + password:
(your UNI username)

Using WinSCP



And we're in!

Using WinSCP



- The left part of the screen is your **local computer**
- The right side of the screen is the **remote server**
- **Don't mix them up!** 😊
- To upload a file from your computer to the server, simply drag and drop the file icon to the server
- To download a file to your computer from the server, drag and drop the file from the server to your computer
- Make sure you are **in the right directories** on both, your computer and the server!

Using WinSCP

Home vs Web directory

- When you log into weblab.uni.edu you will be placed in your home directory (*for example, [/home/johnsnow](#)*).
- Files created in your home directory are private and only accessible by you (and your instructor).
- You will notice that your home directory contains a sub-directory called [web](#). This is where you should place html files that you would like to be accessible from your web url (<http://weblab.uni.edu/johnsnow>).

Example: [/home/johnsnow/web/index.html](#) is publicly viewable at <http://weblab.uni.edu/johnsnow/index.html> or just <http://weblab.uni.edu/johnsnow>

Now try and upload our simple web page + the image you used

Congratulations - You are online!

