Let’s Make Some Website!!!

You will learn about basics of how internet works and build your own website!
It will be a fascinating journey, so be focused and stay on the track, yay!

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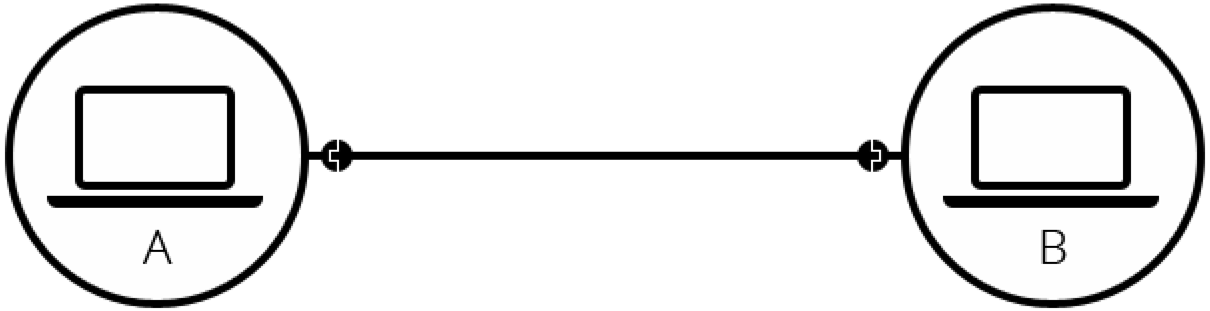
Himpunan Mahasiswa Elektroteknik
Institut Teknologi Bandung

HME ITB

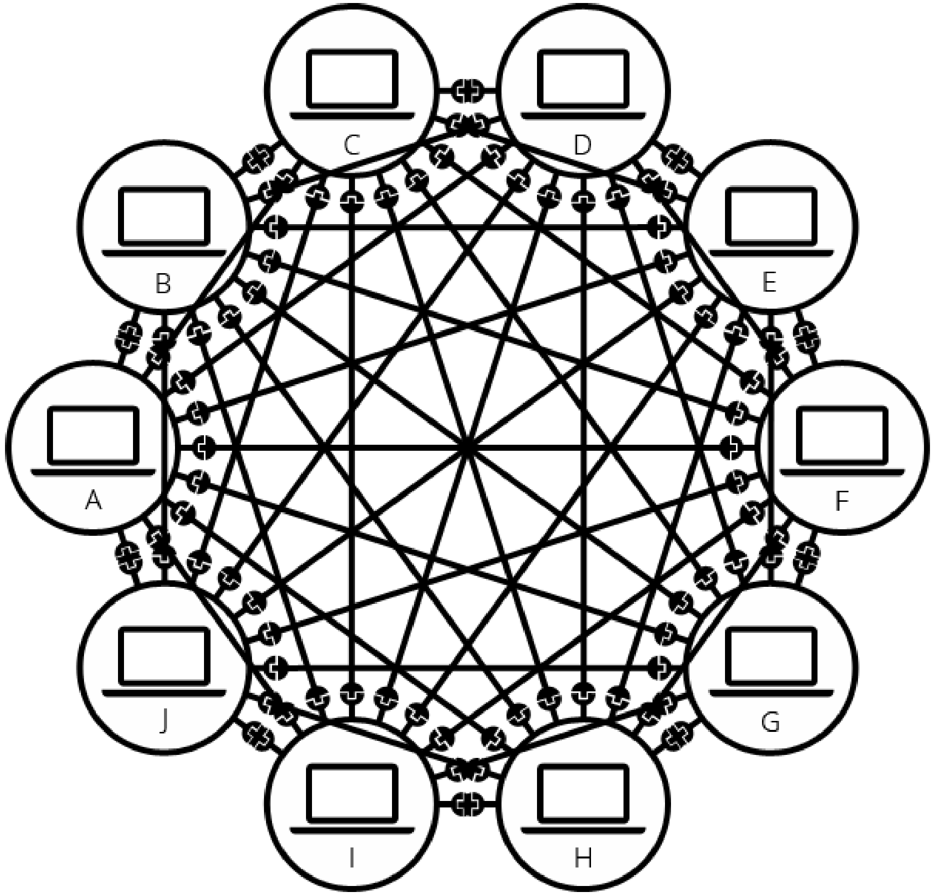
The Story of Internet

How does the Internet work?

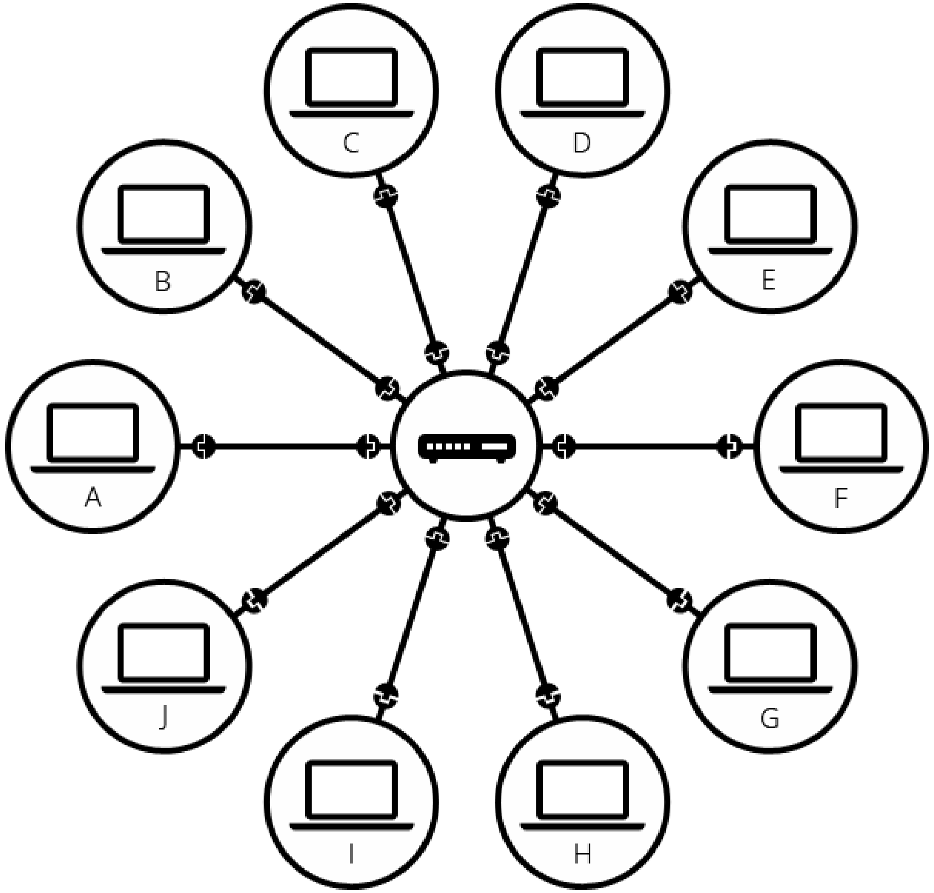
Simple **one-to-one** Network



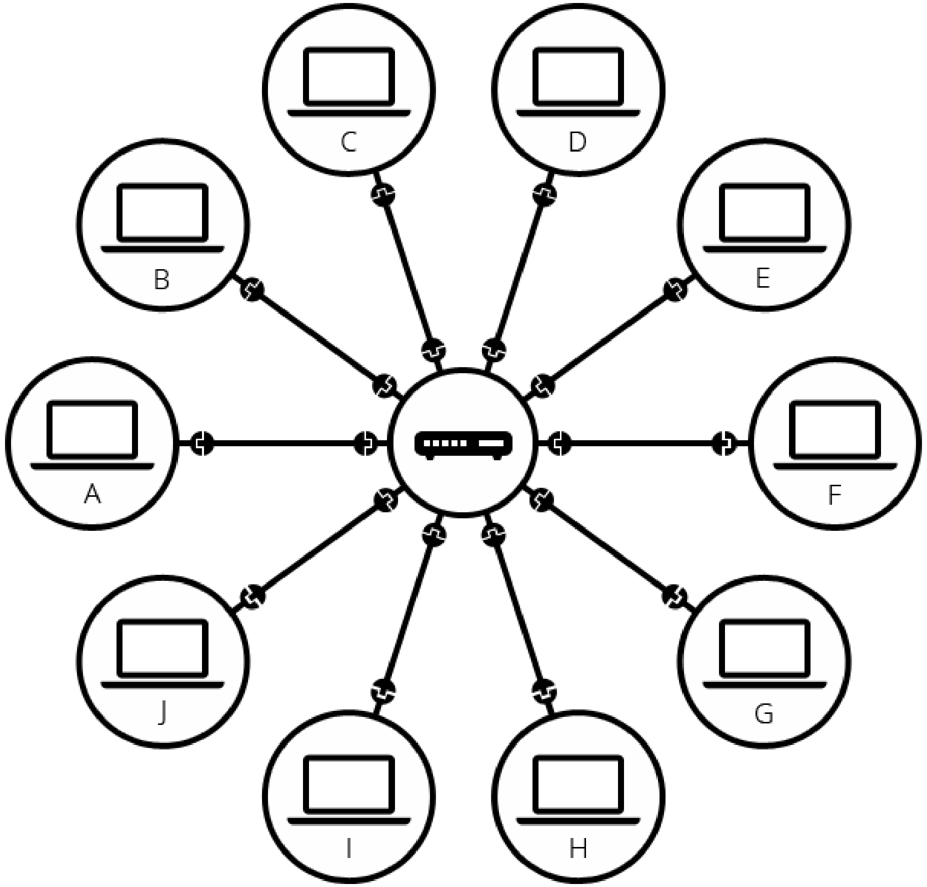
However, what if you want to connect 9 computer?

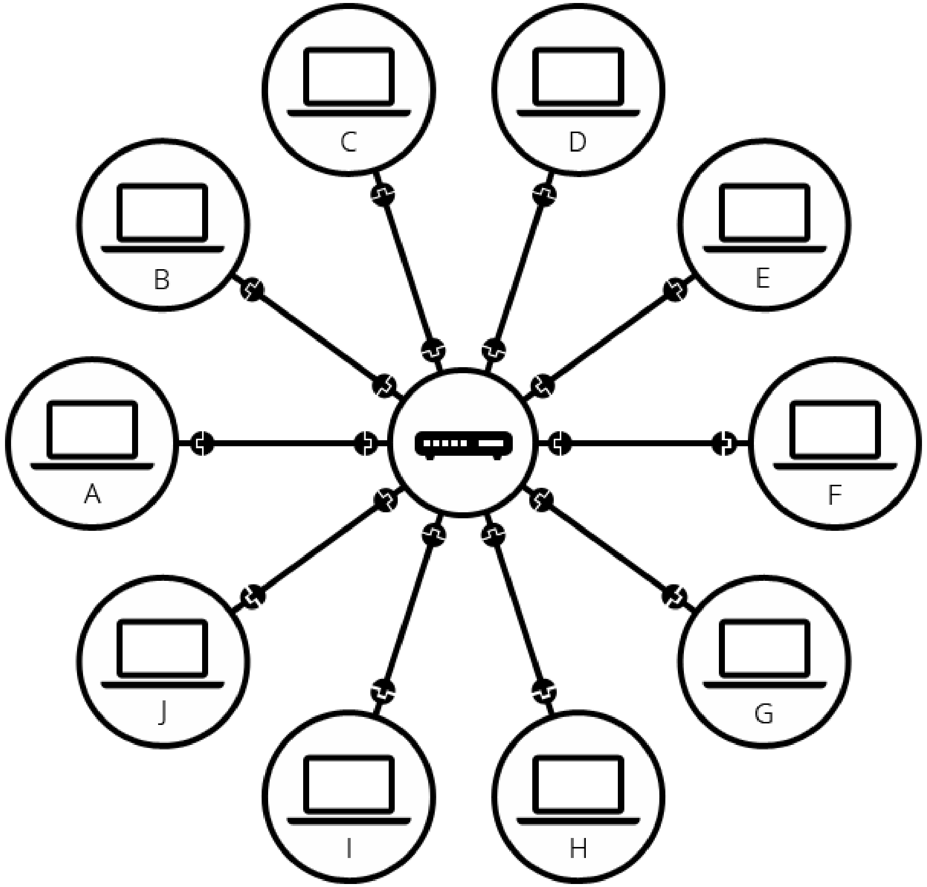


The solution is **Router**!

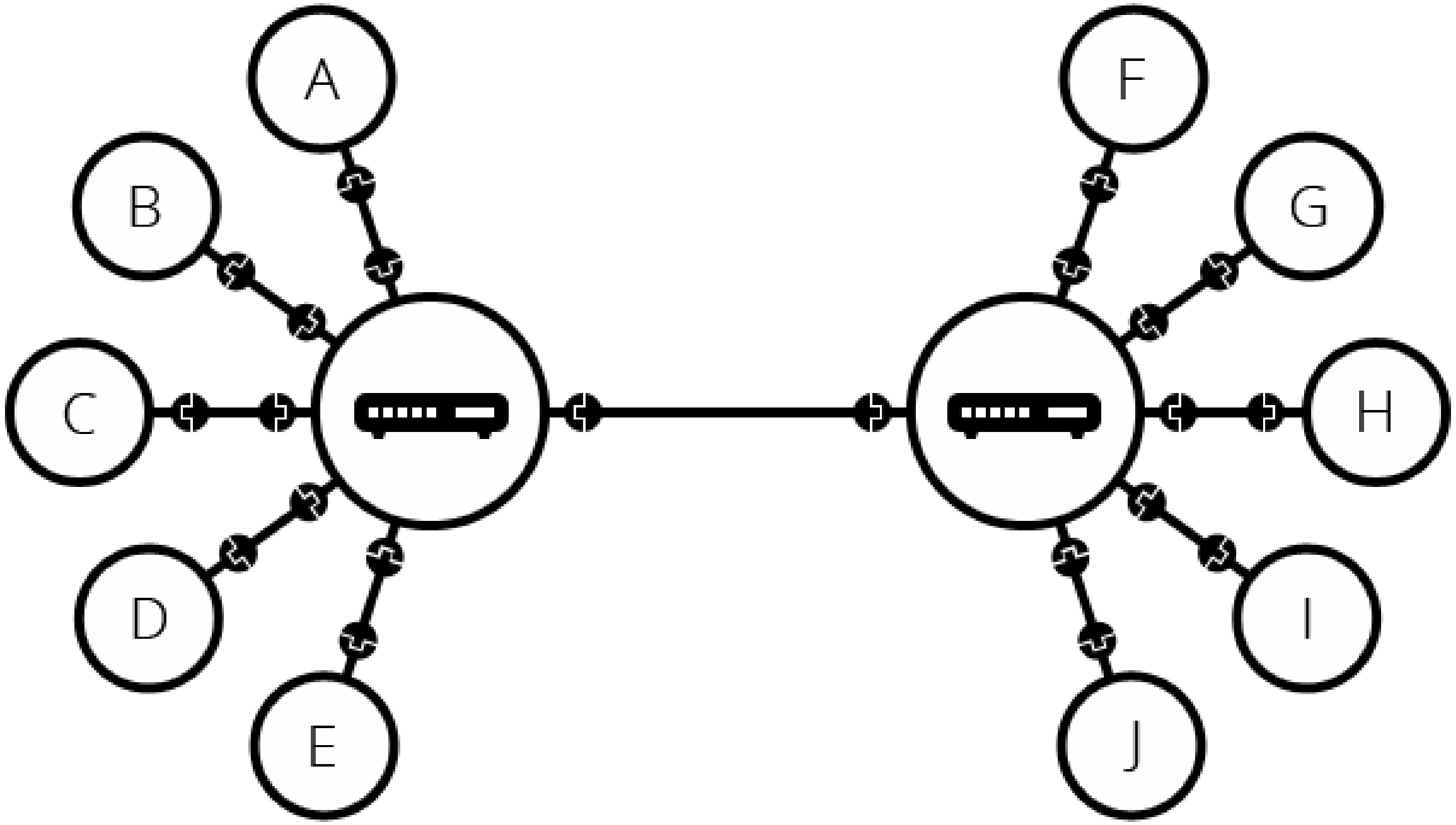


But, in this world there are more than billion of **people**!

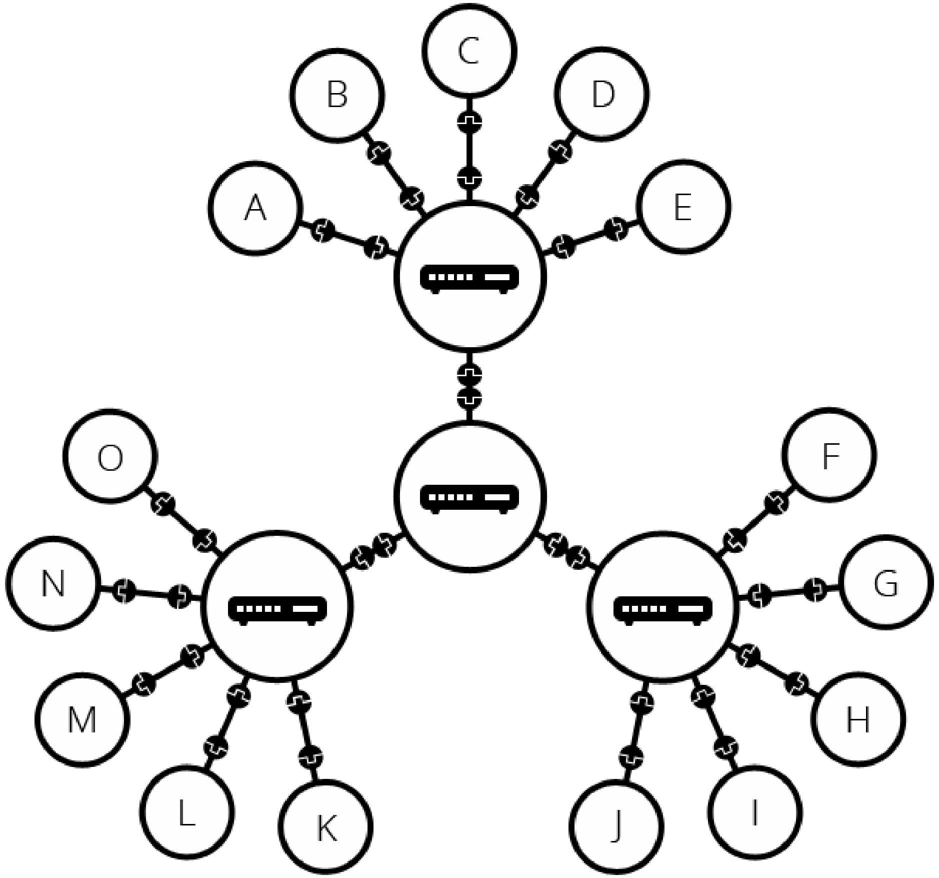




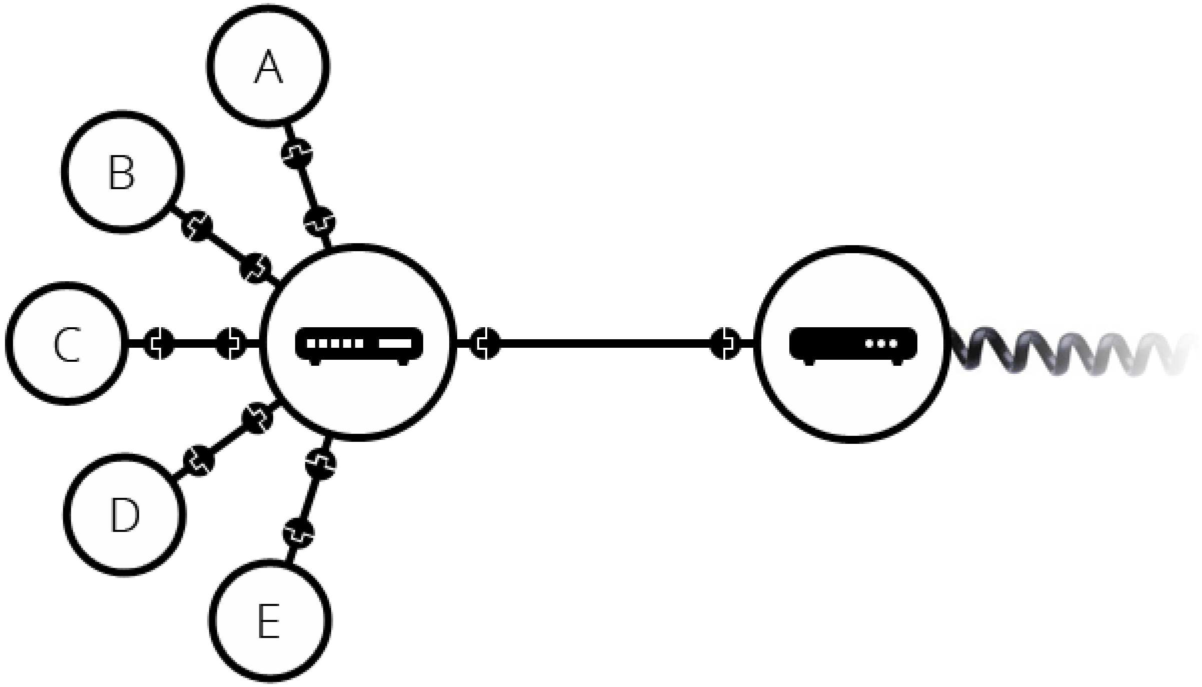
Oops, we forgot that router is also a computer.



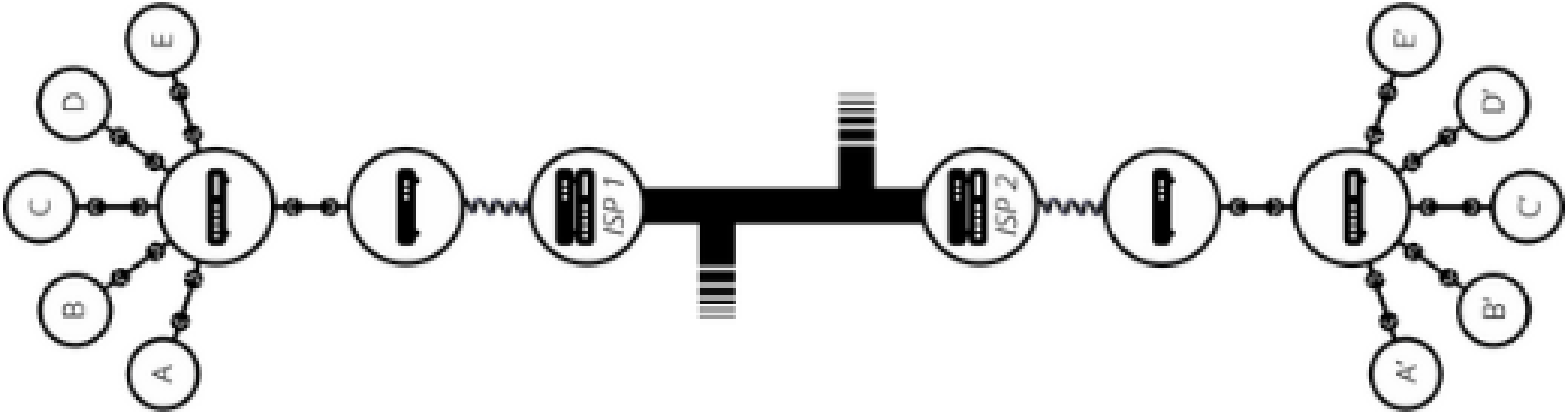
Now, we could scale **infinitely**!



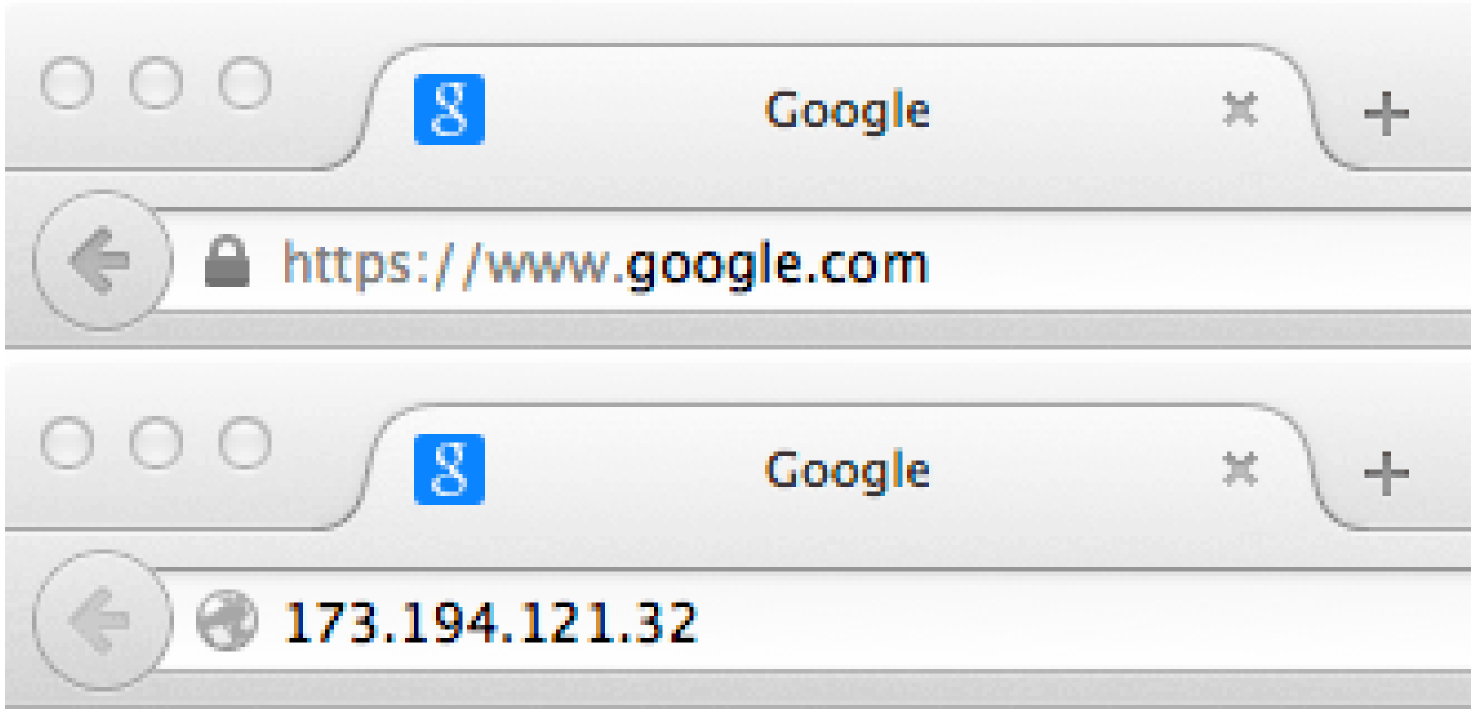
We could use existing technology, Telephone!



Sending our message to the world!



But, how to find our destination?



https://www.google.com

173.194.121.32

Internet and the Web

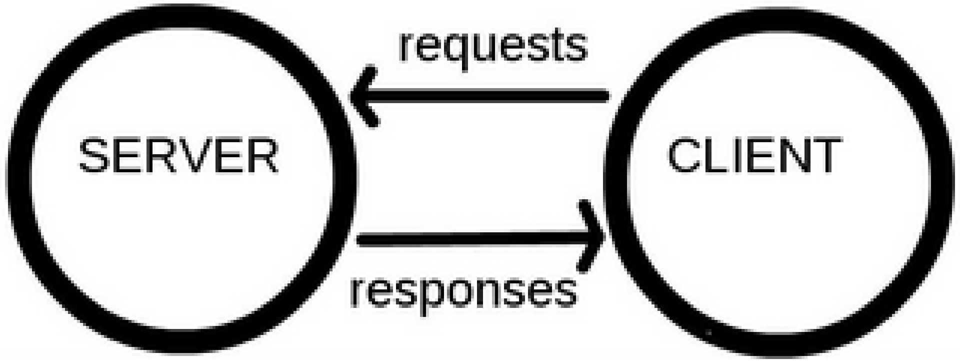
Internet is a technical **infrastructure** which allow billion of computer to be connected together

Web is a **service** built on top of the Internet. There are also another services that build on top of the Internet such as e-mail and IRC.

The Story of Web

How does the Web work?

The Simplified Model



Some analogy to help you understand

Internet Connection

TCP/IP

DNS

HTTP

So, what’s really happening?

1. The browser **goes to the DNS server**, and **finds the real address** of the server that the website lives on (**you find the address of the shop**).

2. The browser **sends an HTTP request** message to the server, **asking it to send a copy** of the website to the client (**you go to the shop and order your goods**). This message, and all other **data sent between the client and the server**, is sent across your **internet connection using TCP/IP**.

3. Provided the **server approves the client's request**, the server sends the client a "200 **OK**" message, which means "Of course you can look at that website! Here it is", and then **starts sending the website's files** to the browser as a **series of small chunks called data packets** (**the shop gives you your goods, and you bring them back to your house**).

4. The browser **assembles the small chunks into a complete website** and displays it to you (**the goods arrive at your door — new shiny stuff, awesome!**).

More about DNS and Packets

DNS or Domain Name Server is invented because **we don’t want to remember all those number** of every website.

DNS would **provide us the IP address** of our favourite website. Cool Right?

Packets is a **format of sent data** from server to client.

When data is sent across the Web, **data is sent as small chunk**. This will **allow many user** to use the Web at the same time.

If the data is sent as big chunk, only one user can access the web ☹

The Story of Your First Website

Let’s learn some basic terminology and how web works!

This gonna be fun!

Let’s Install the Basic Software

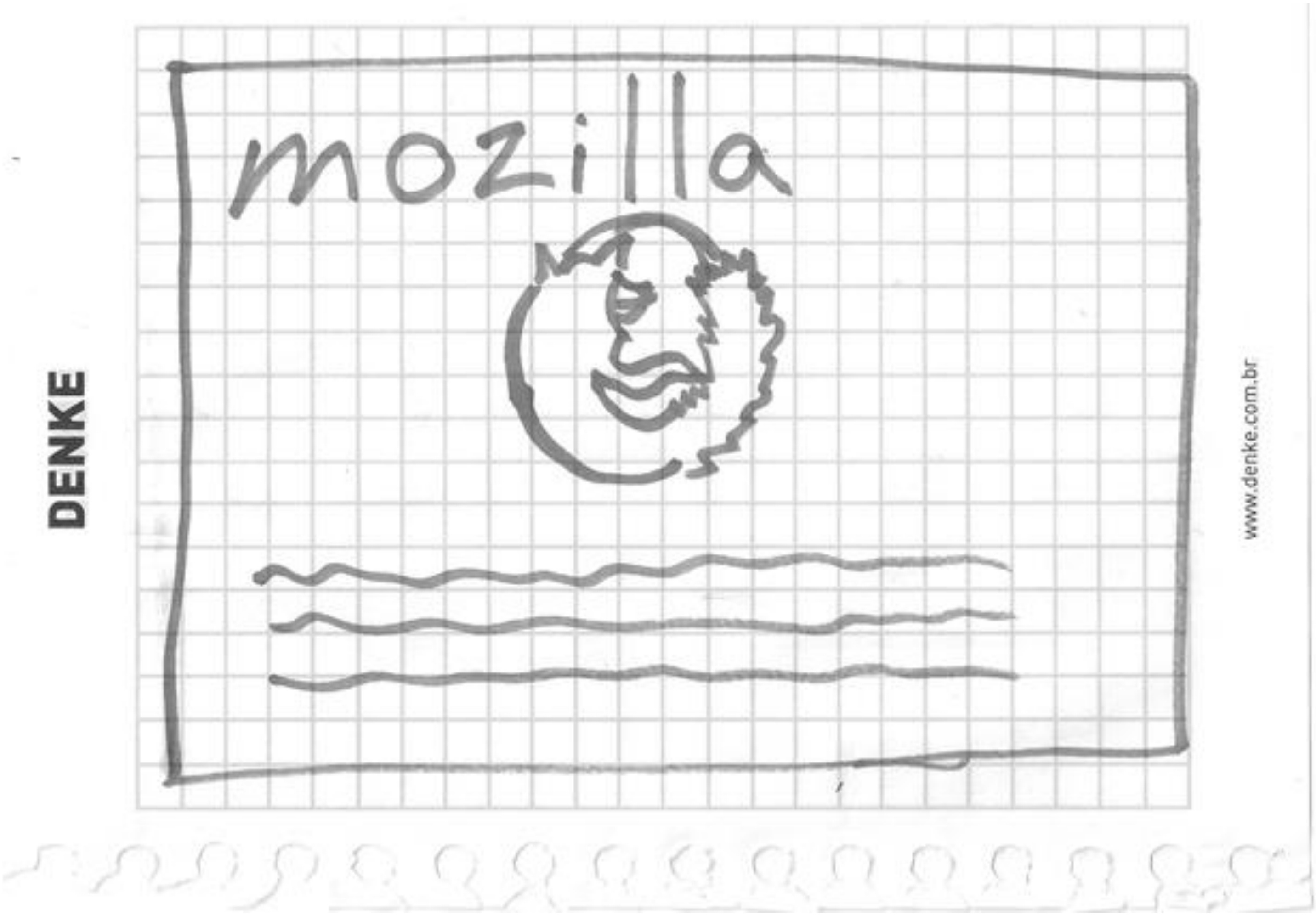
- Text Editor
  - Any editor will suffice (Vim, emac, Visual Studio Code, Notepad++, or even Notepad)
  - Bracket is also a good one!
- Web Browser
  - Some developer prefer Chrome or Firefox
  - Install **at least two** browser for testing purpose!
- Local Web Server (optional)
  - Local web server for serving your website locally
  - We won’t use this today tho

Next, plan what will your website look like?

Answer these Question:

1. What is your website about?
2. What information are you presenting on the Subject?
3. What does your website look like?

Sketch your website out!



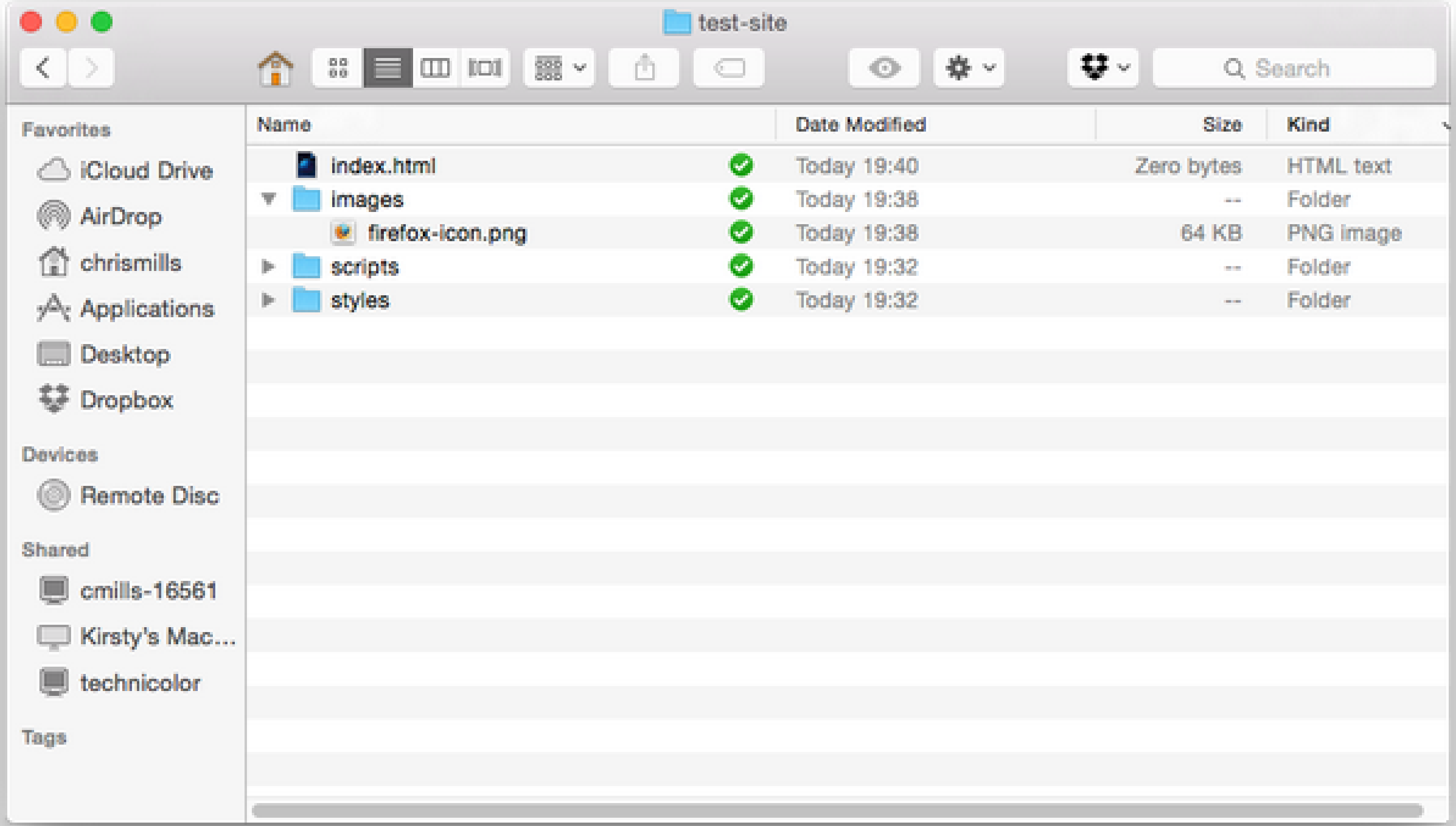
Choosing your Assets!

- Text
  - The paragraph and sentences should be as professional as possible.
  - Make the information as brief as possible, don’t confuse reader!
- Theme color
  - Choosing color is one of web designer job, sometimes it will be hard but the other time it will be easy.
- Images
  - You could search for stock images online. But, becareful with copyright!
- Font
  - The font also decide how your website aestethic and readability, so choose carefully!

Organize the file structure!

- Project Folder
  - **Choose a folder** to put your projects such as '**web-project'**
  - Inside the folder, create another folder for your first website '**test-site**'
- Casing and Spacing
  - **Use lower case and hypen (-)** for the file name because usually the web server is *case sensitive*. This will reduce the hassle of remembering which letter is upper case (MyFileName.html).
- Structure
  - **index.html:** Usually this will contain your homepage content
  - **images** folder: This will contain all your images for the website
  - **styles** folder: This will contain CSS code used to style your content
  - **script** folder: This will contain JS code to add some interactive function

The structure should look like this



Name	Date Modified	Size	Kind
index.html	Today 19:40	Zero bytes	HTML text
▼ images	Today 19:38	--	Folder
firefox-icon.png	Today 19:38	64 KB	PNG image
▶ scripts	Today 19:32	--	Folder
▶ styles	Today 19:32	--	Folder

HTML
The Skeleton of Our Website

Finally, no more story please, let's get into the real thing!

What is HTML

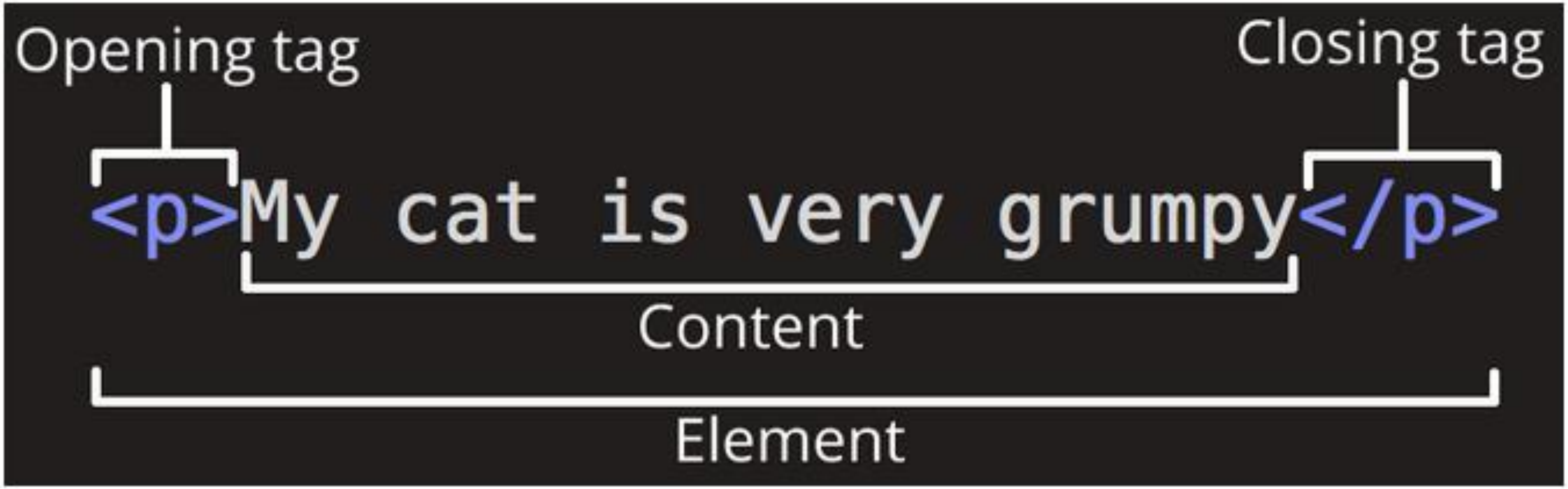
- HTML is **not** a programming language!
- HTML consist of several element that structures your webpage.
- For, example we want to display this as one stand line

My cat is very grumpy

- In HTML, we could specify the sentence as paragraph by enclosing it in paragraph tags

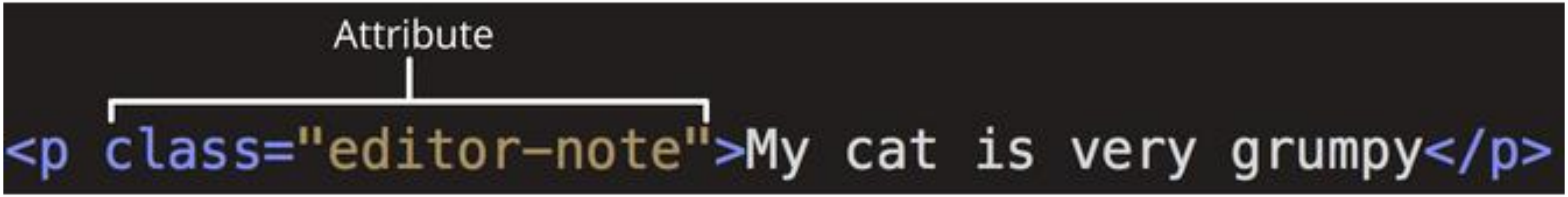
<p> My cat is very grumpy </p>

Dissecting the HTML



```
<p>My cat is very grumpy</p>
```

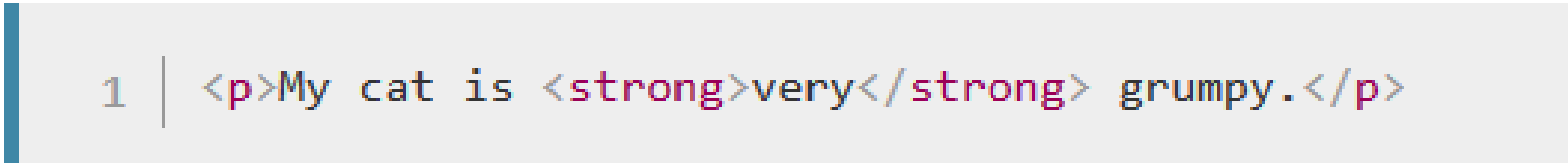
Adding some Attributes



```html
<p class="editor-note">My cat is very grumpy</p>
```

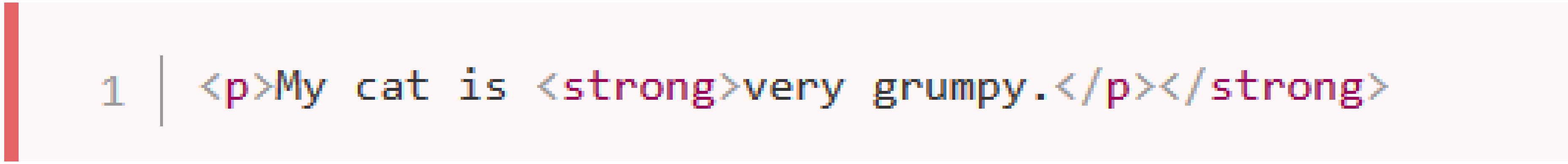
Nesting Attribute

Correct



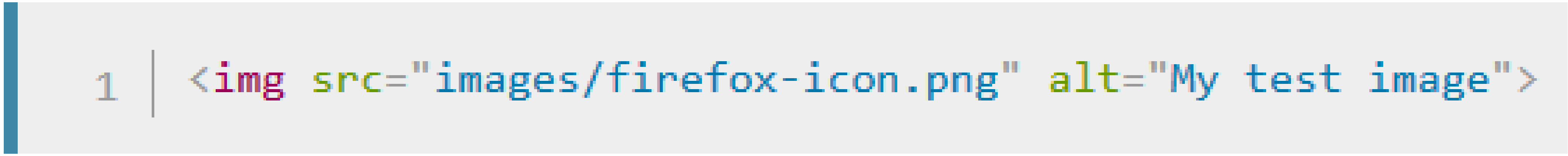
```html
<p>My cat is <strong>very</strong> grumpy.</p>
```

Incorrect



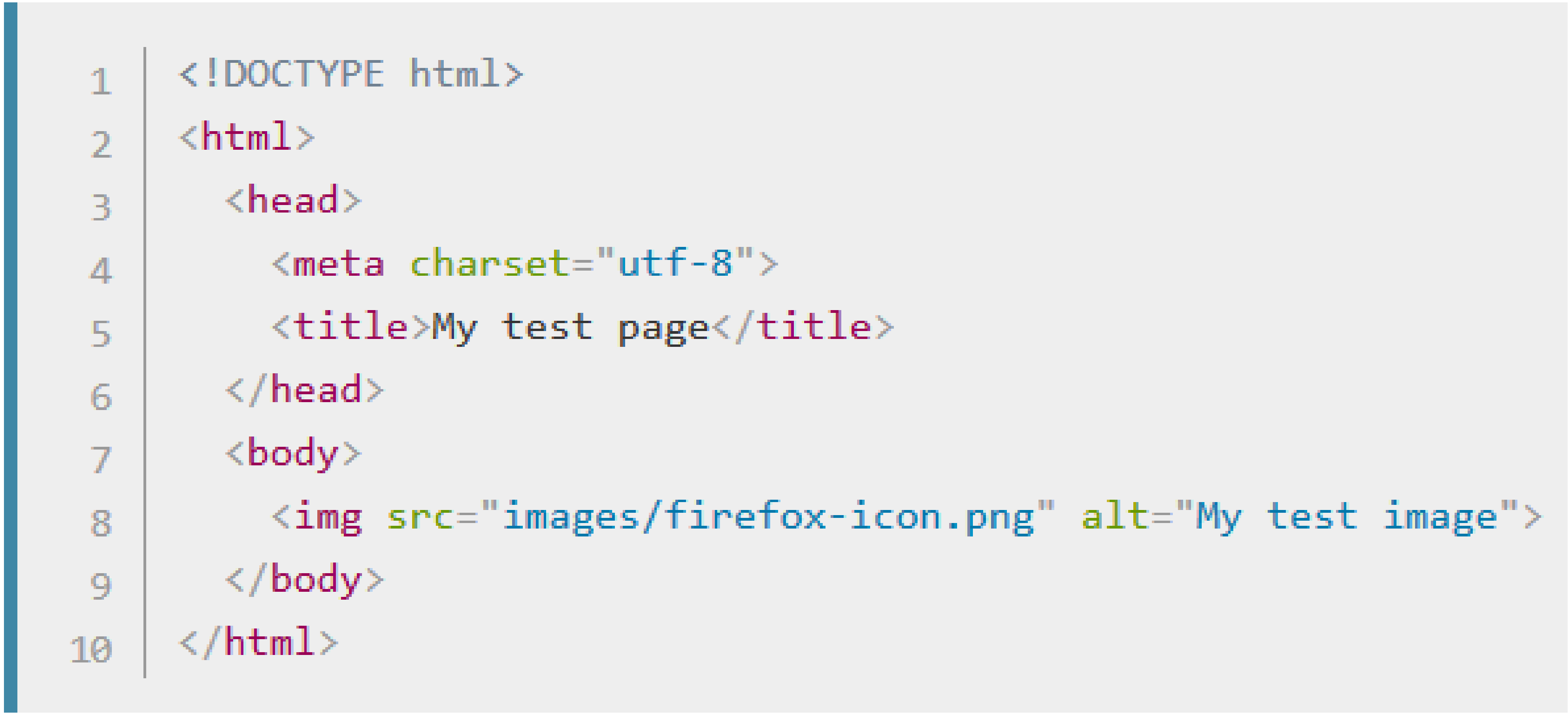
```html
<p>My cat is <strong>very grumpy.</p></strong>
```

Empty Element



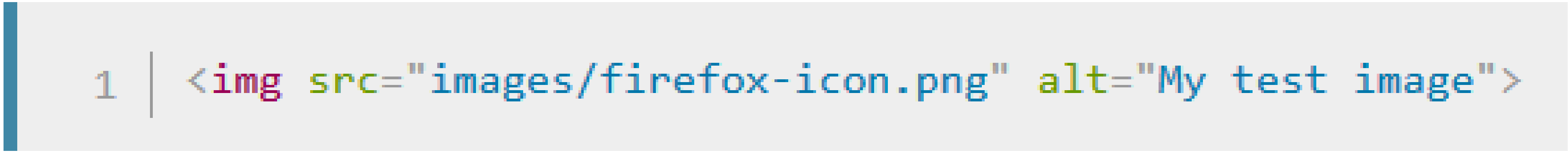
```html
<img src="images/firefox-icon.png" alt="My test image">
```

Anatomy of a HTML Document



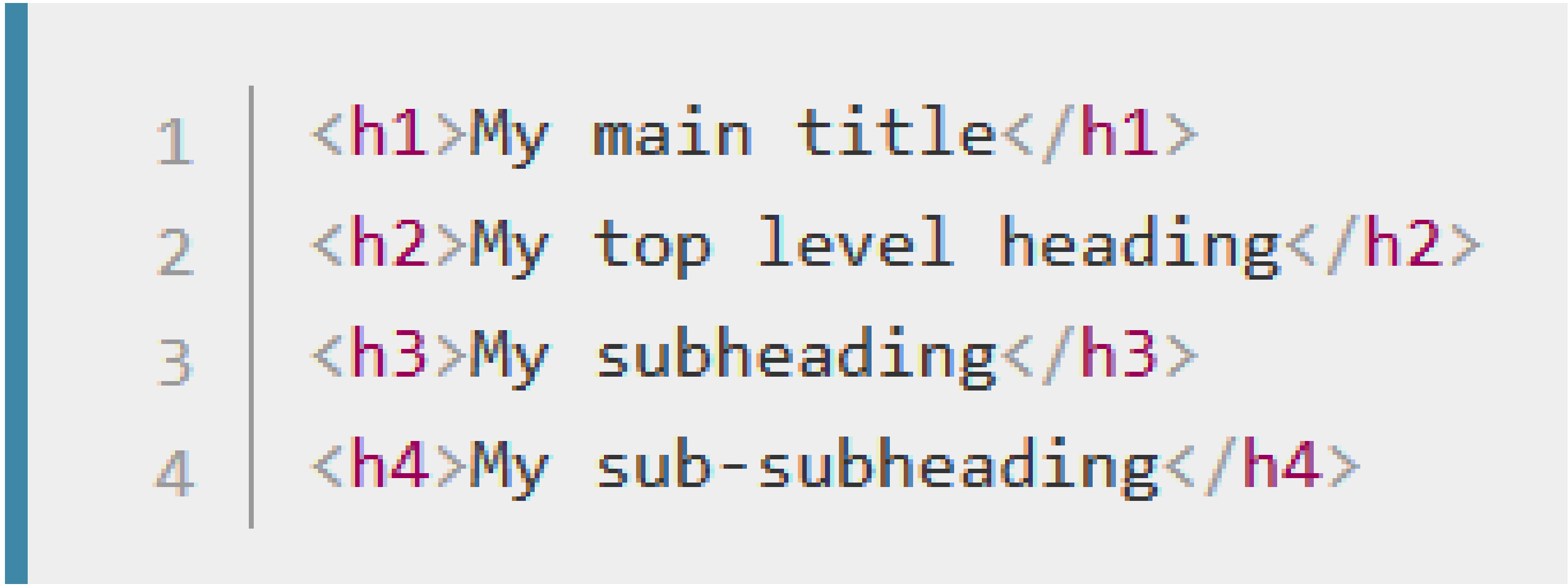
```html
<!DOCTYPE html>
<html>
  <head>
    <meta charset="utf-8">
    <title>My test page</title>
  </head>
  <body>
    <img src="images/firefox-icon.png" alt="My test image">
  </body>
</html>
```

Adding some Image



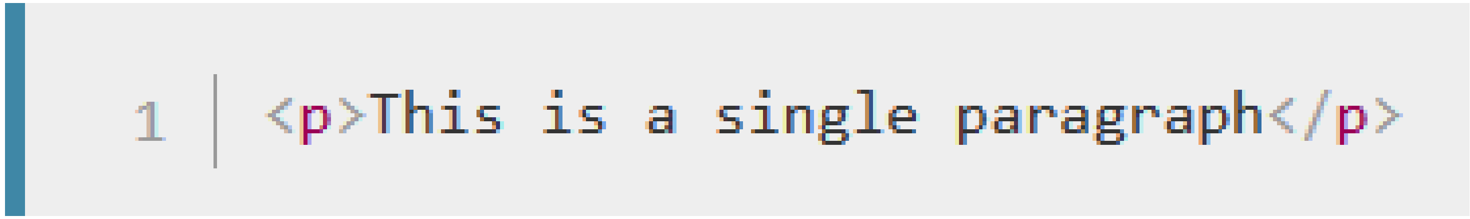
```
<img src="images/firefox-icon.png" alt="My test image">
```

Marking Text: Header



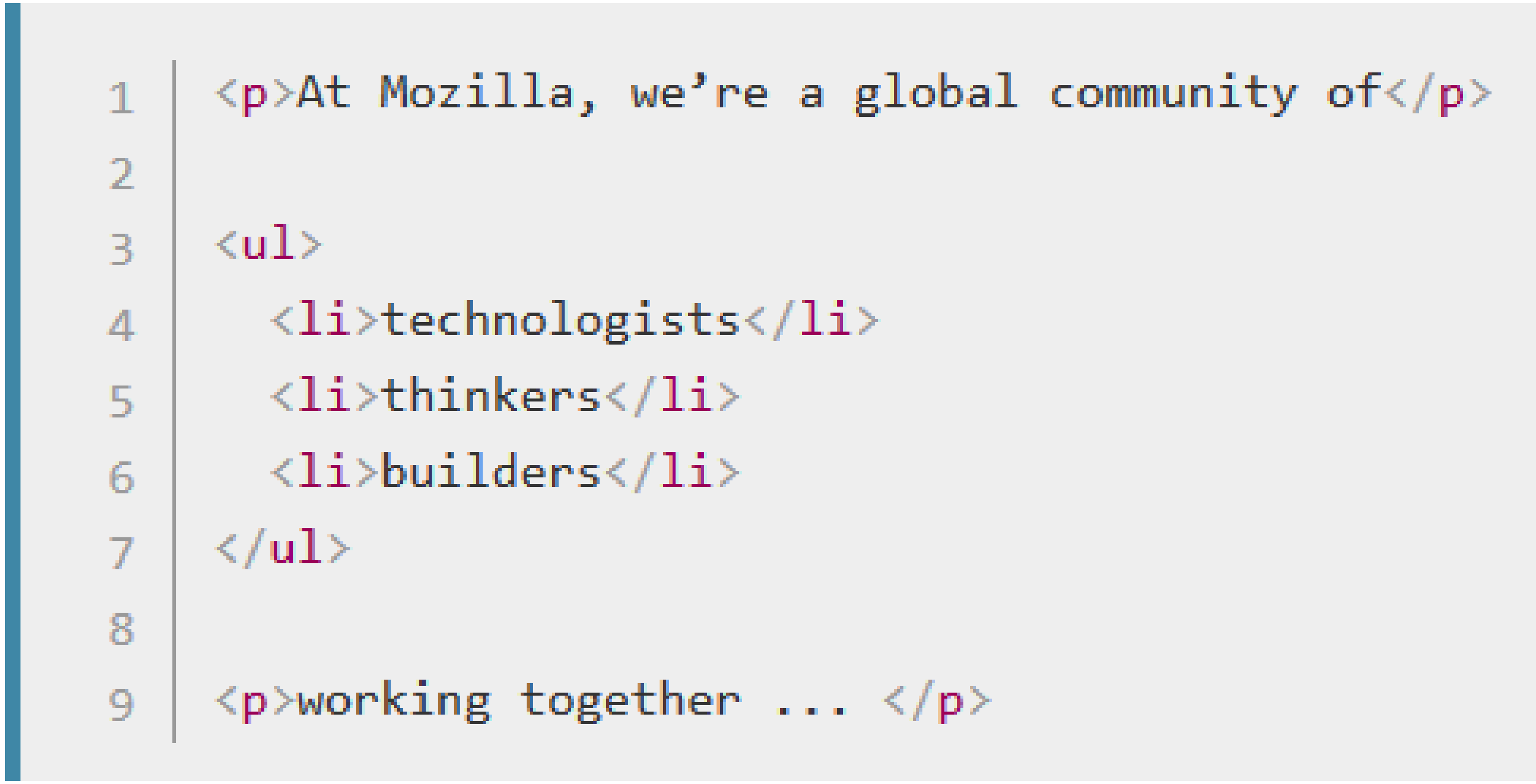
```
<h1>My main title</h1>
<h2>My top level heading</h2>
<h3>My subheading</h3>
<h4>My sub-subheading</h4>
```

Marking Text: Paragraph



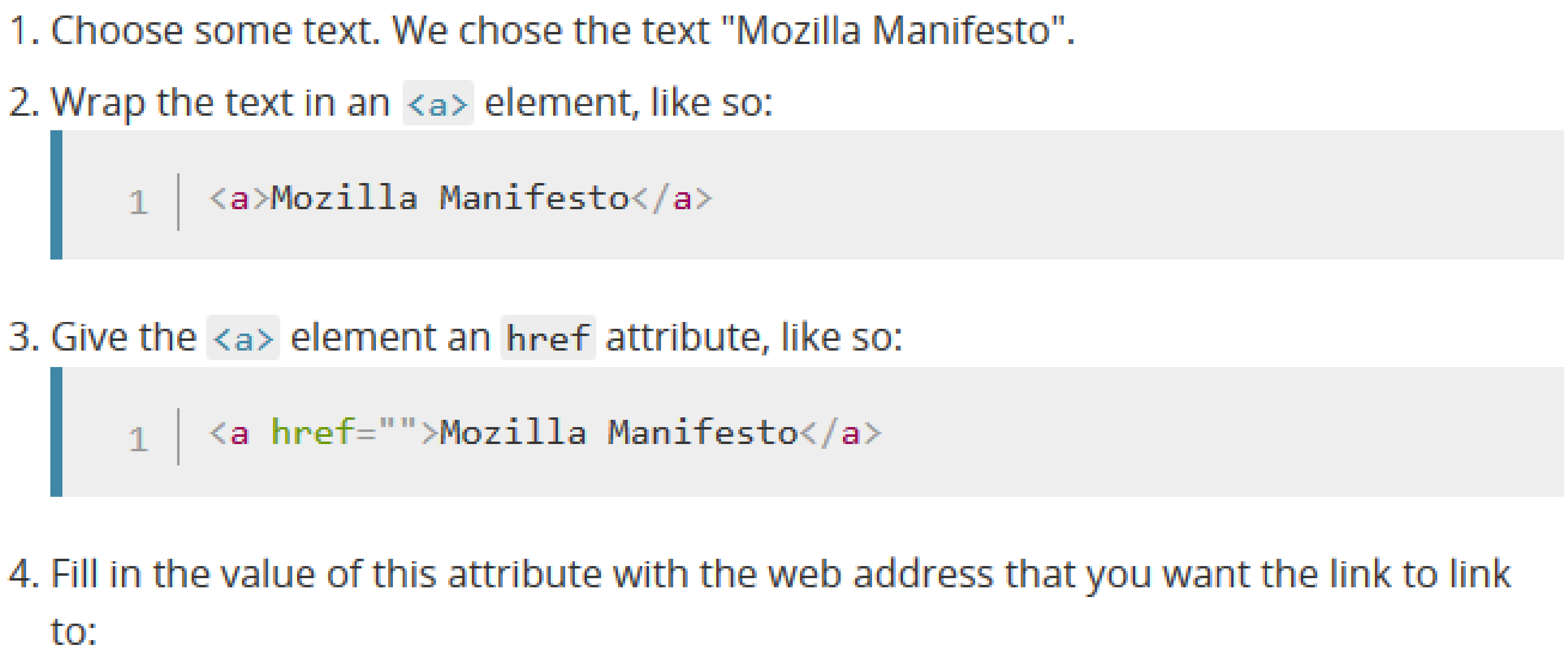
```html
<p>This is a single paragraph</p>
```

Marking Text: List



```html
<p>At Mozilla, we’re a global community of</p>

<ul>
  <li>technologists</li>
  <li>thinkers</li>
  <li>builders</li>
</ul>

<p>working together ... </p>
```

Marking Text: Link



1. Choose some text. We chose the text "Mozilla Manifesto".
2. Wrap the text in an `<a>` element, like so:

```
<a>Mozilla Manifesto</a>
```

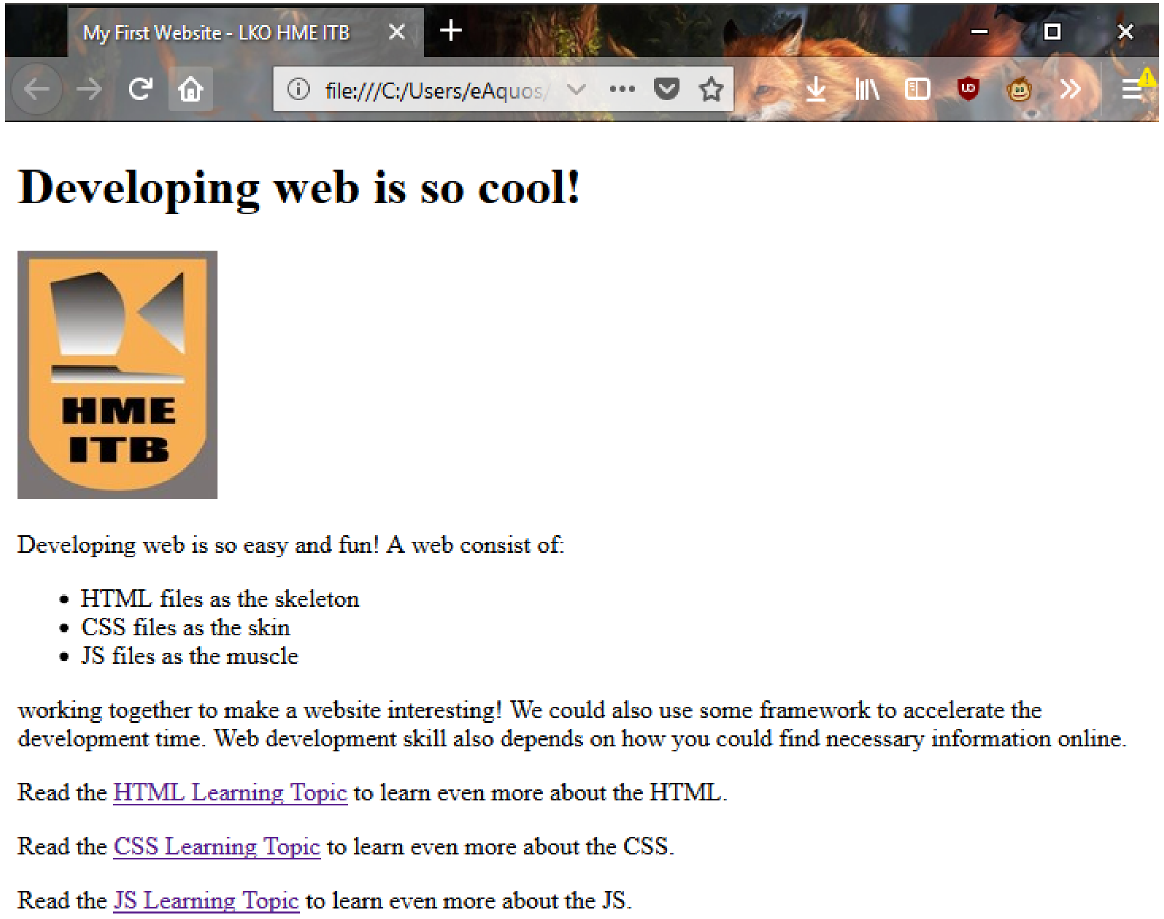
3. Give the `<a>` element an `href` attribute, like so:

```
<a href="">Mozilla Manifesto</a>
```

4. Fill in the value of this attribute with the web address that you want the link to link to:

```
<a href="https://www.mozilla.org/en-US/about/manifesto/">Mozilla Manifesto</a>
```

Let’s Build This!



Developing web is so cool!

Developing web is so easy and fun! A web consist of:

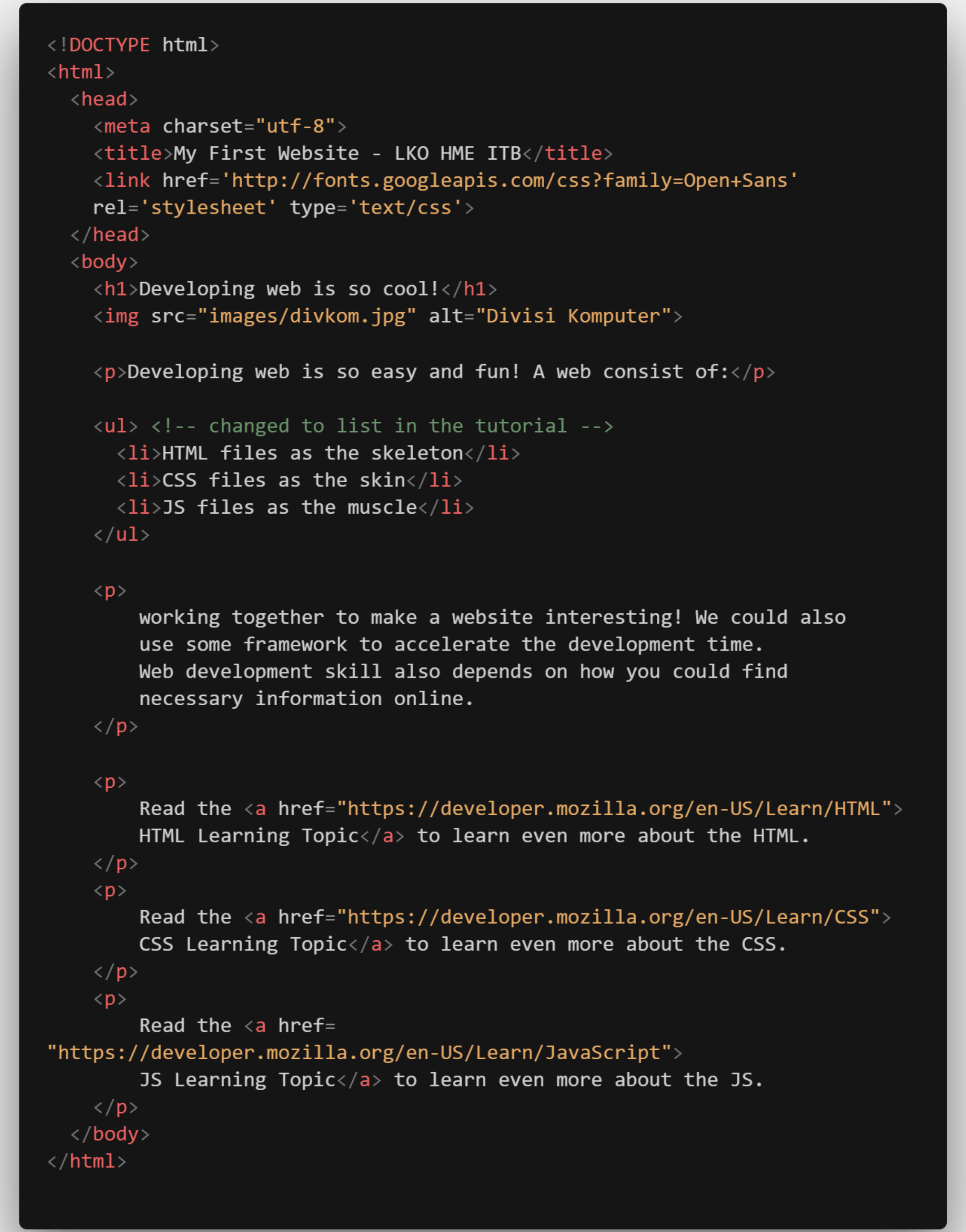
- HTML files as the skeleton
- CSS files as the skin
- JS files as the muscle

working together to make a website interesting! We could also use some framework to accelerate the development time. Web development skill also depends on how you could find necessary information online.

Read the HTML Learning Topic to learn even more about the HTML.

Read the CSS Learning Topic to learn even more about the CSS.

Read the JS Learning Topic to learn even more about the JS.



```html
<!DOCTYPE html>
<html>
  <head>
    <meta charset="utf-8">
    <title>My First Website - LKO HME ITB</title>
    <link href='http://fonts.googleapis.com/css?family=Open+Sans'
    rel='stylesheet' type='text/css'>
  </head>
  <body>
    <h1>Developing web is so cool!</h1>
    <img src="images/divkom.jpg" alt="Divisi Komputer">

    <p>Developing web is so easy and fun! A web consist of:</p>

    <ul> <!-- changed to list in the tutorial -->
      <li>HTML files as the skeleton</li>
      <li>CSS files as the skin</li>
      <li>JS files as the muscle</li>
    </ul>

    <p>
        working together to make a website interesting! We could also
        use some framework to accelerate the development time.
        Web development skill also depends on how you could find
        necessary information online.
    </p>

    <p>
        Read the <a href="https://developer.mozilla.org/en-US/Learn/HTML">
        HTML Learning Topic</a> to learn even more about the HTML.
    </p>
    <p>
        Read the <a href="https://developer.mozilla.org/en-US/Learn/CSS">
        CSS Learning Topic</a> to learn even more about the CSS.
    </p>
    <p>
        Read the <a href=
"https://developer.mozilla.org/en-US/Learn/JavaScript">
        JS Learning Topic</a> to learn even more about the JS.
    </p>
  </body>
</html>
```

CSS
The Skin of Our Website

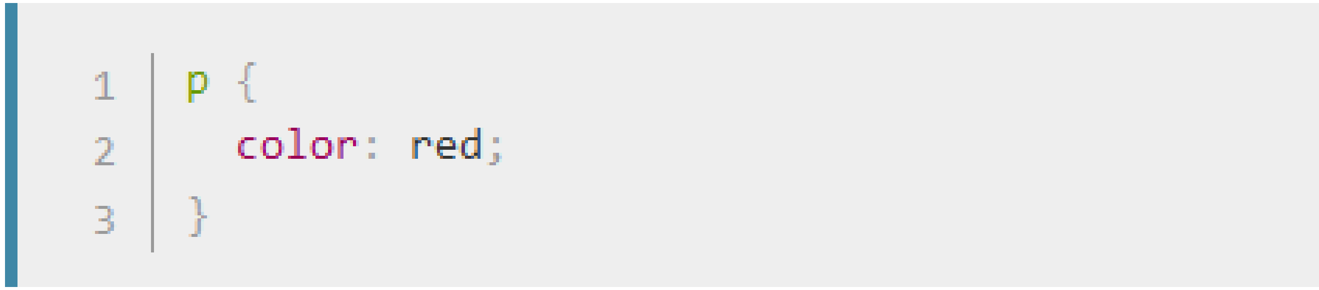
Let’s style our Website!

What is CSS

- CSS is also **not** a programming language!
- CSS consist of several element that style your website.
- For, example we want to display this paragraph as red colored text

<p> My cat is very grumpy </p>

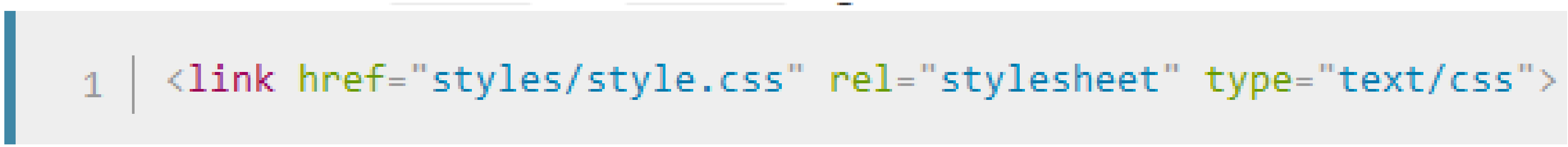
- In CSS, we could specify the paragraph by selecting it and apply some style.



```
p {
  color: red;
}
```

What is CSS

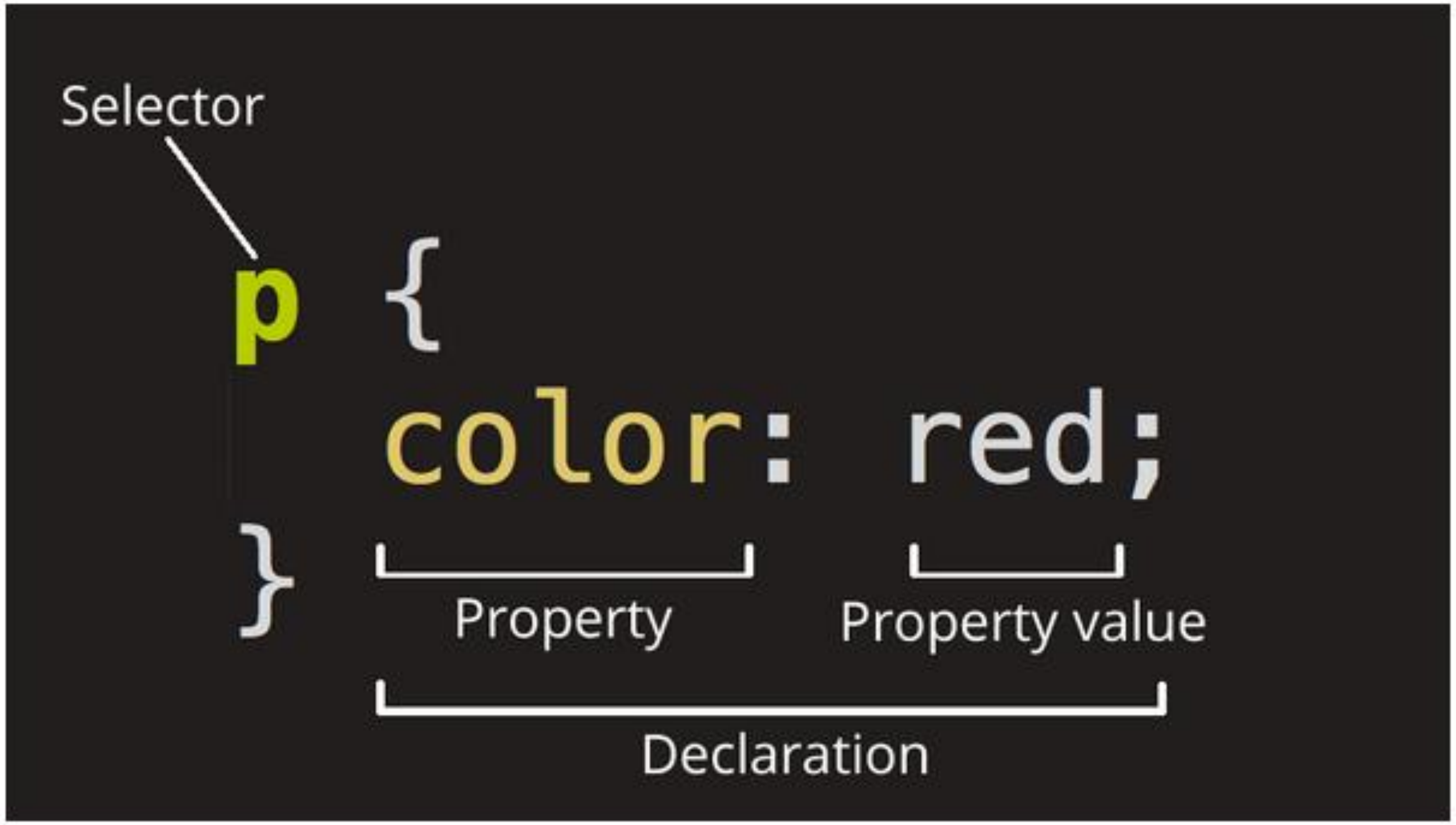
- After that, save the code into `styles/style.css`
- Open your `index.html` and add this line to the <head></head> tag



```
<link href="styles/style.css" rel="stylesheet" type="text/css">
```

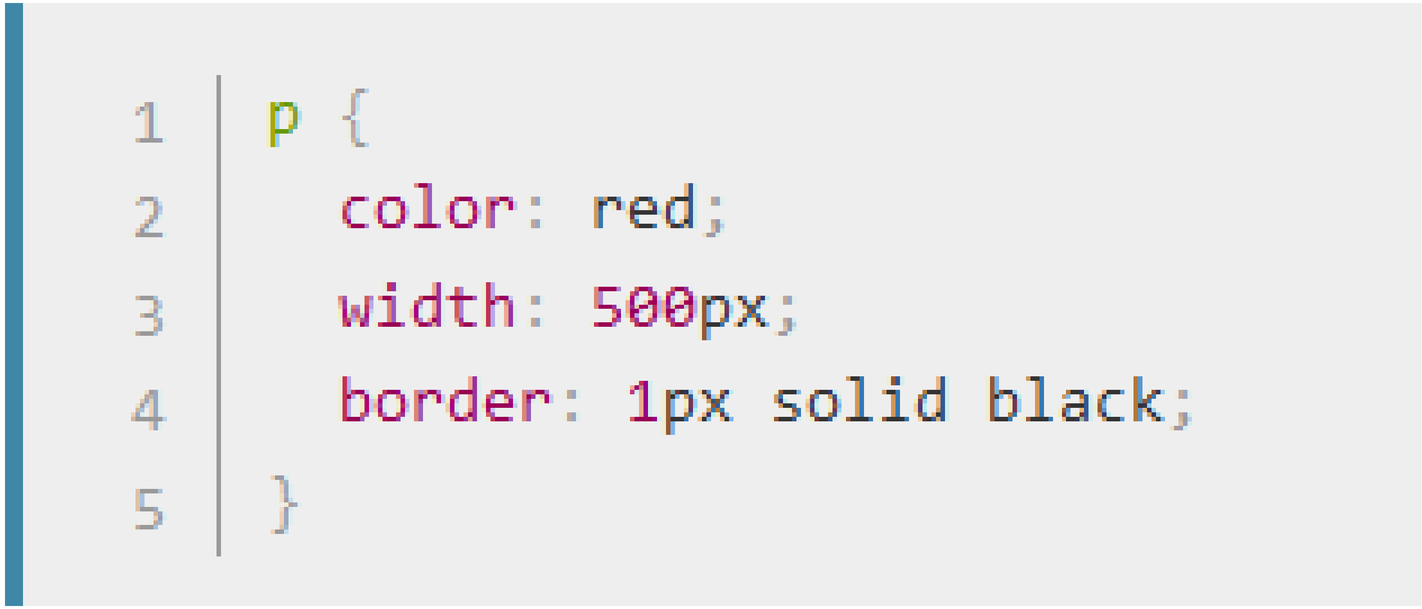
- Save `index.html` and refresh!

Dissecting the CSS



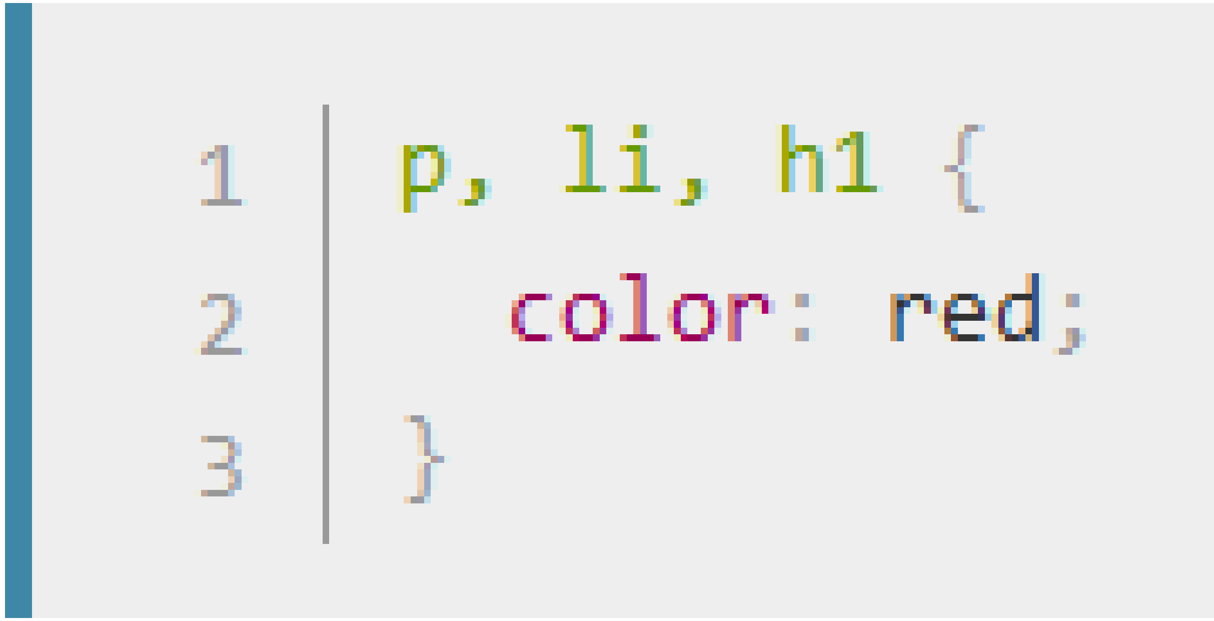
```css
p {
  color: red;
}
```

Multiple Rules



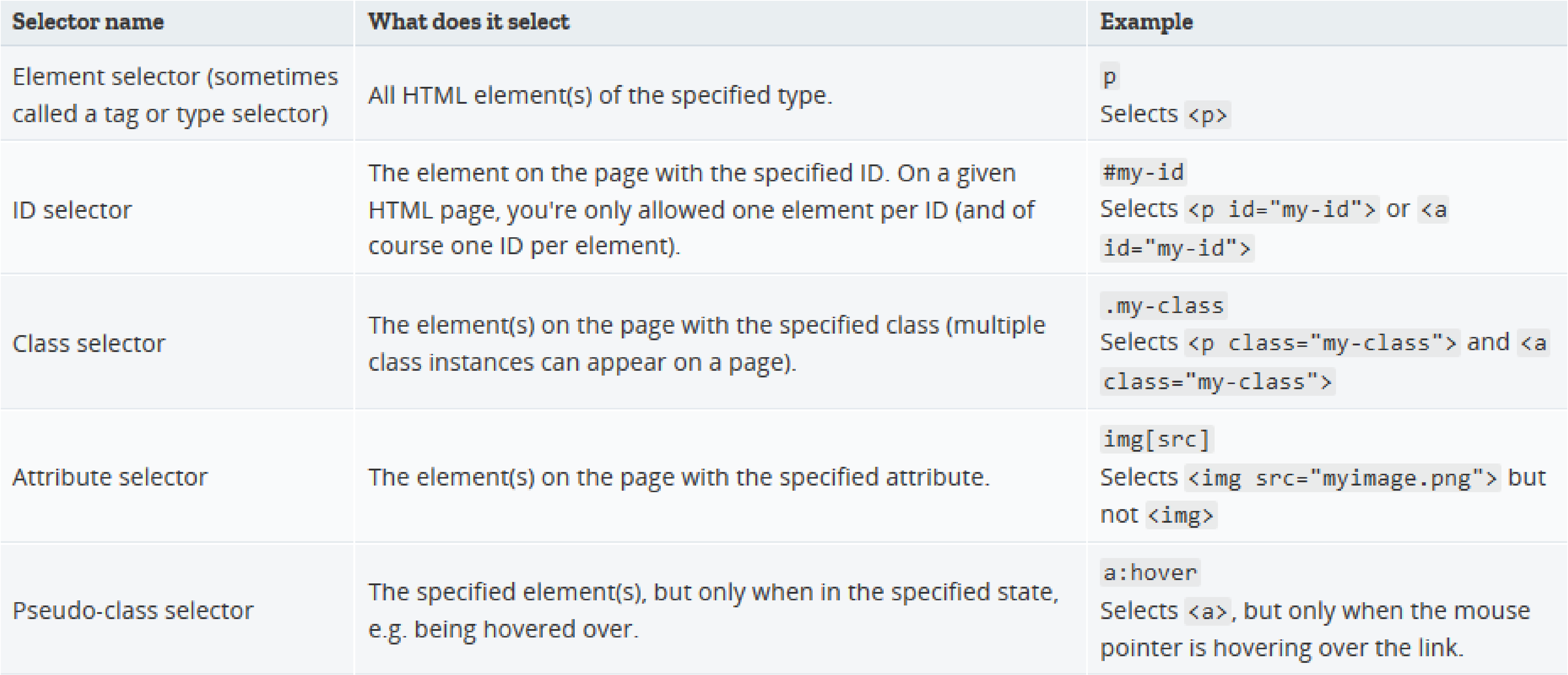
```
p {
  color: red;
  width: 500px;
  border: 1px solid black;
}
```

Selecting Multiple Element



```
p, li, h1 {
   color: red;
}
```

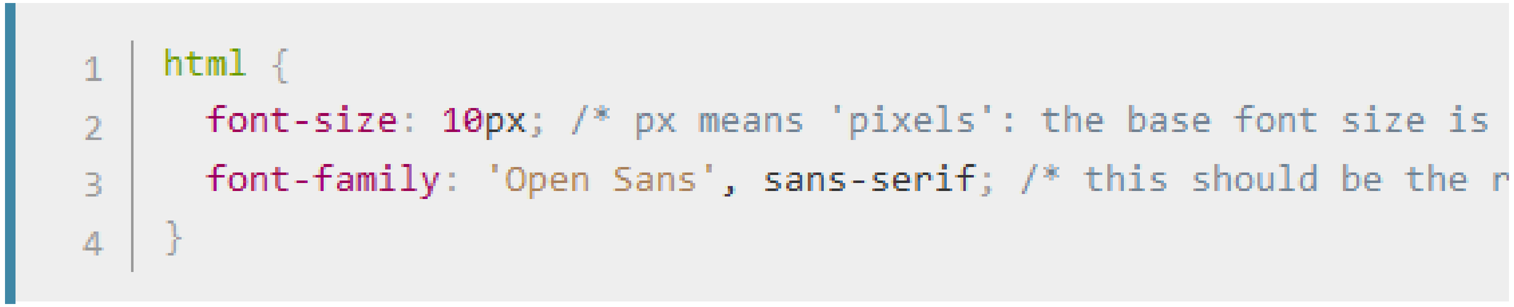
More Selector



Selector name	What does it select	Example
Element selector (sometimes called a tag or type selector)	All HTML element(s) of the specified type.	`p` Selects `<p>`
ID selector	The element on the page with the specified ID. On a given HTML page, you're only allowed one element per ID (and of course one ID per element).	`#my-id` Selects `<p id="my-id">` or `<a id="my-id">`
Class selector	The element(s) on the page with the specified class (multiple class instances can appear on a page).	`.my-class` Selects `<p class="my-class">` and `<a class="my-class">`
Attribute selector	The element(s) on the page with the specified attribute.	`img[src]` Selects `<img src="myimage.png">` but not `<img>`
Pseudo-class selector	The specified element(s), but only when in the specified state, e.g. being hovered over.	`a:hover` Selects `<a>`, but only when the mouse pointer is hovering over the link.

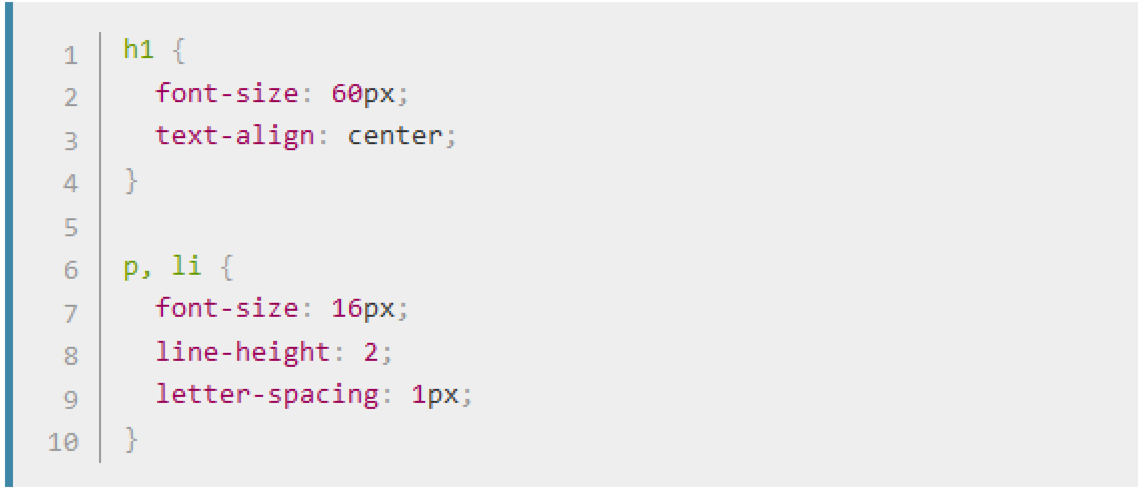
Font and Text

- Create new style.css (delete the red paragraph from before)



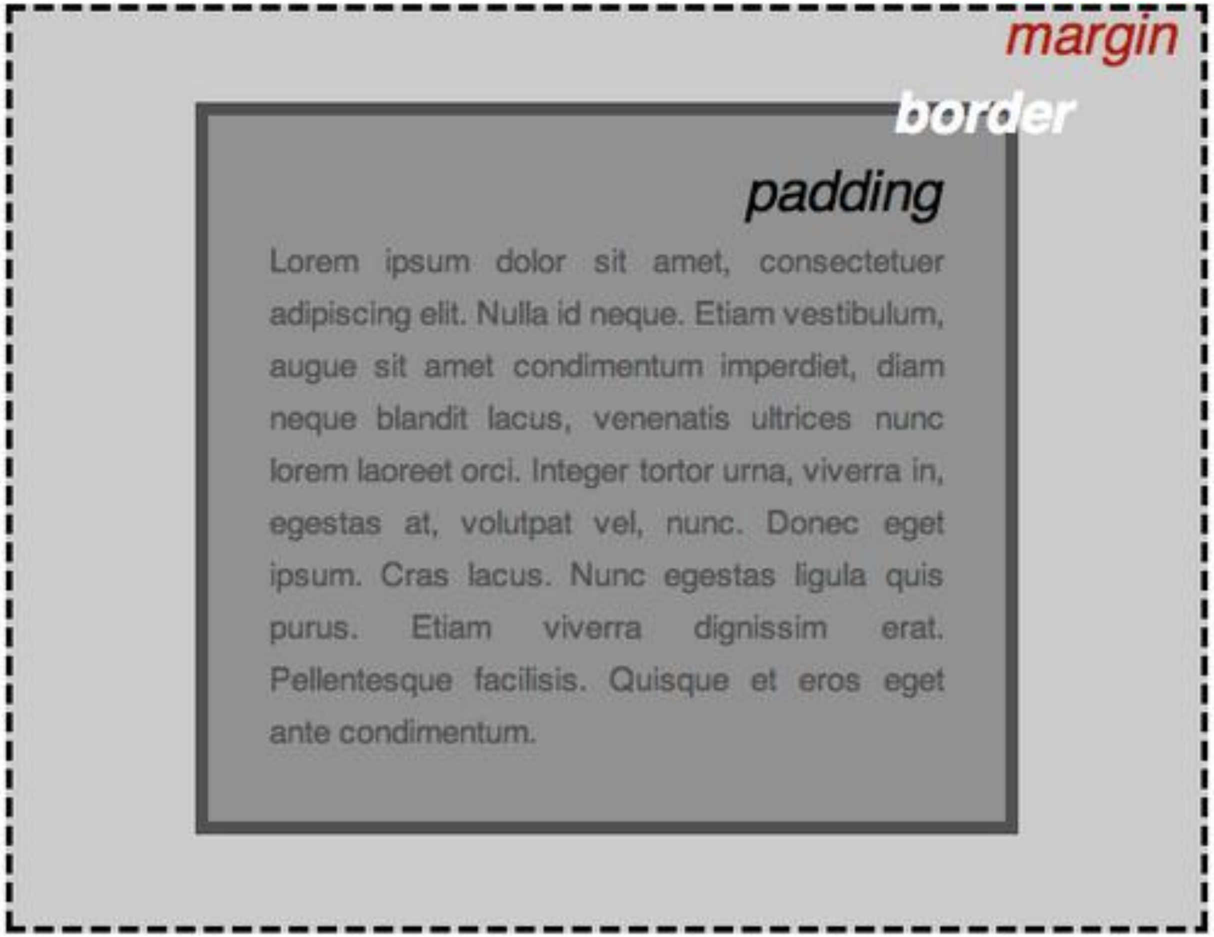
```css
html {
  font-size: 10px; /* px means 'pixels': the base font size is
  font-family: 'Open Sans', sans-serif; /* this should be the r
}
```

- We will also stylize header and list



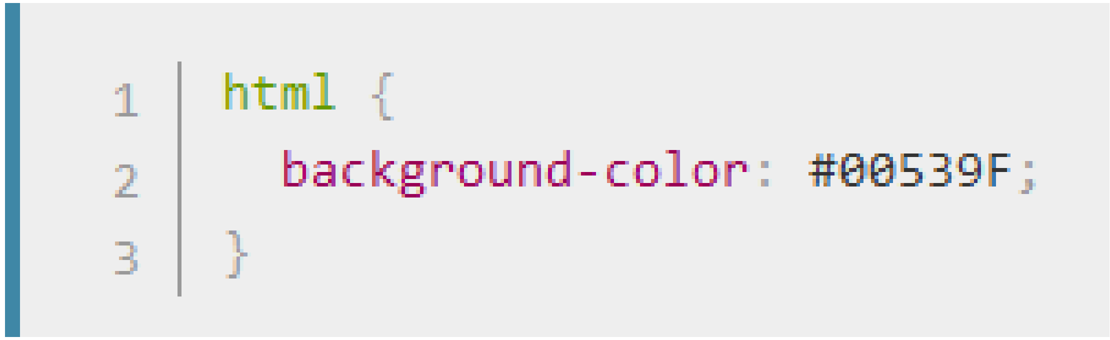
```css
h1 {
  font-size: 60px;
  text-align: center;
}

p, li {
  font-size: 16px;
  line-height: 2;
  letter-spacing: 1px;
}
```

CSS is all about Boxes



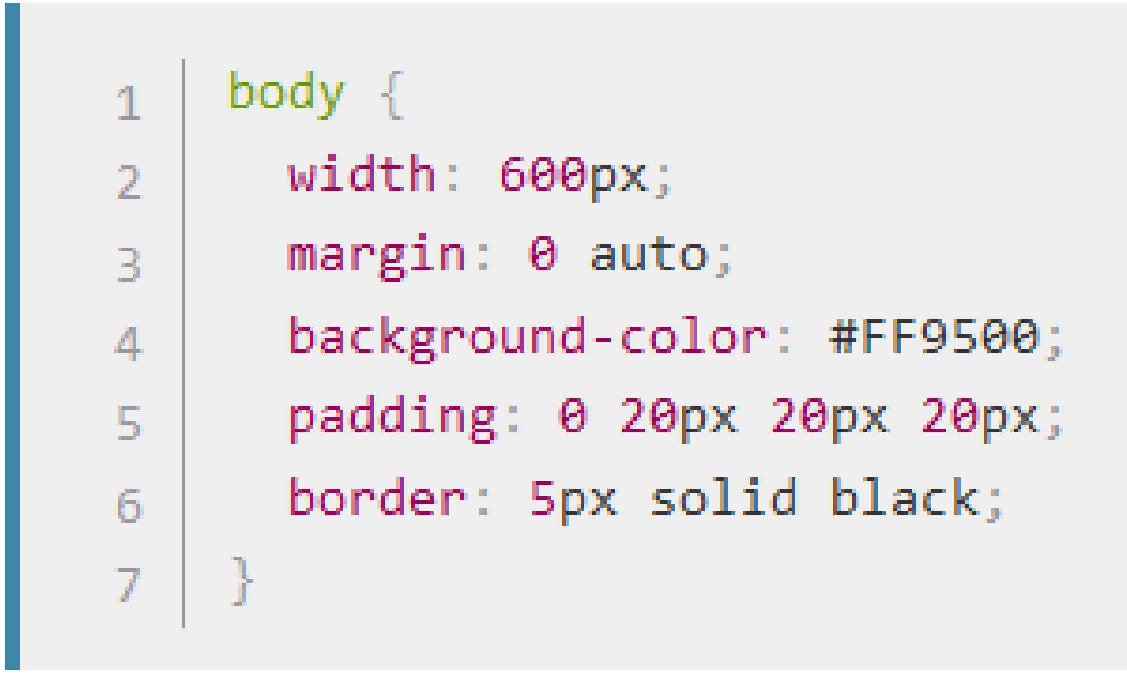
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Nulla id neque. Etiam vestibulum, augue sit amet condimentum imperdiet, diam neque blandit lacus, venenatis ultrices nunc lorem laoreet orci. Integer tortor urna, viverra in, egestas at, volutpat vel, nunc. Donec eget ipsum. Cras lacus. Nunc egestas ligula quis purus. Etiam viverra dignissim erat. Pellentesque facilisis. Quisque et eros eget ante condimentum.

Changing Page Color



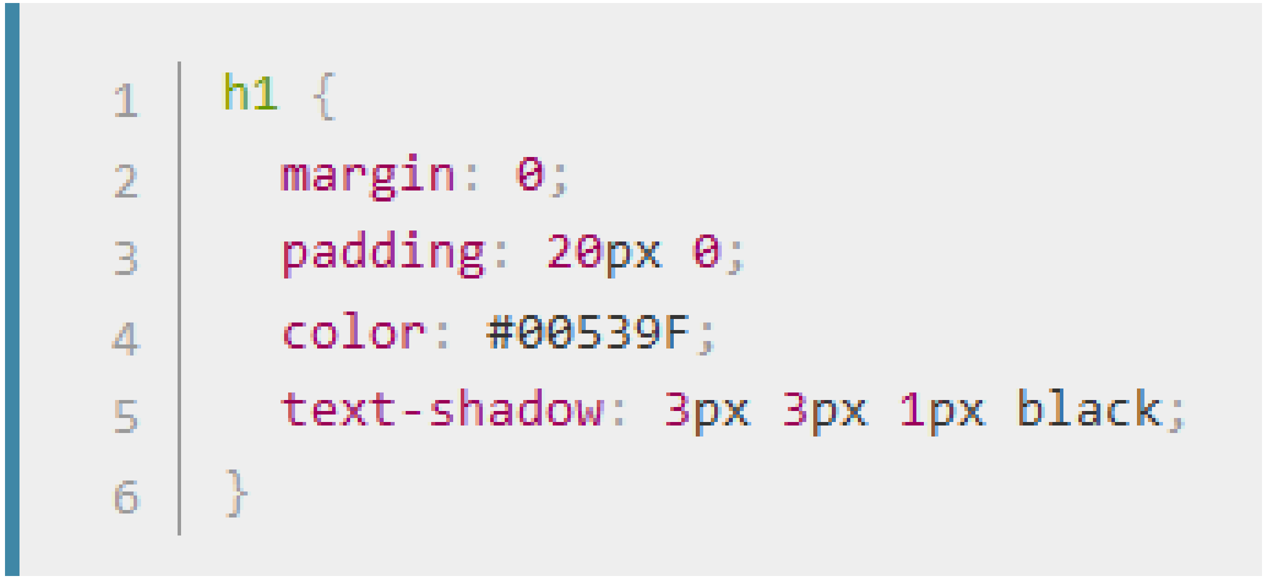
```
html {
  background-color: #00539F;
}
```

Sorting the Body Out



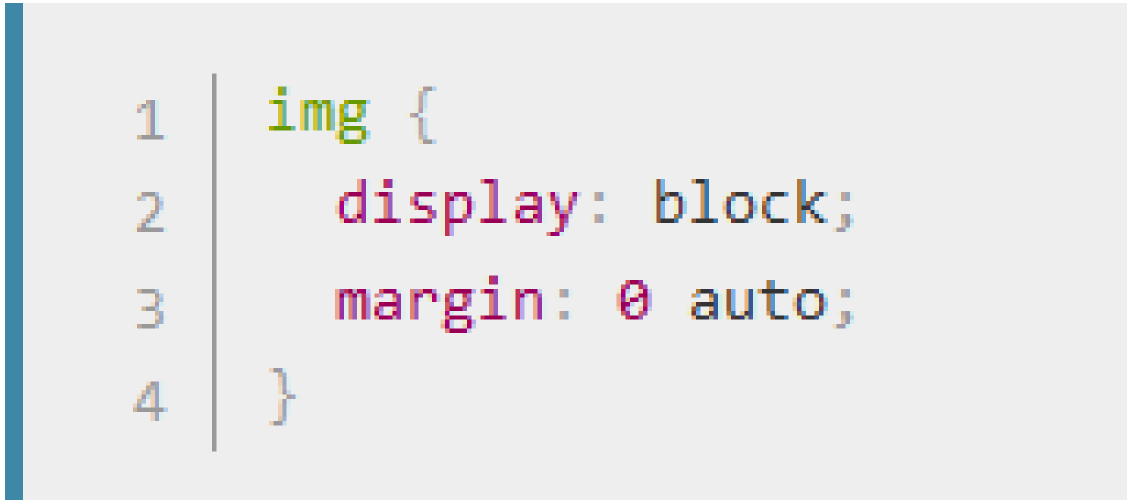
```css
body {
  width: 600px;
  margin: 0 auto;
  background-color: #FF9500;
  padding: 0 20px 20px 20px;
  border: 5px solid black;
}
```

Positioning and Styling our Title



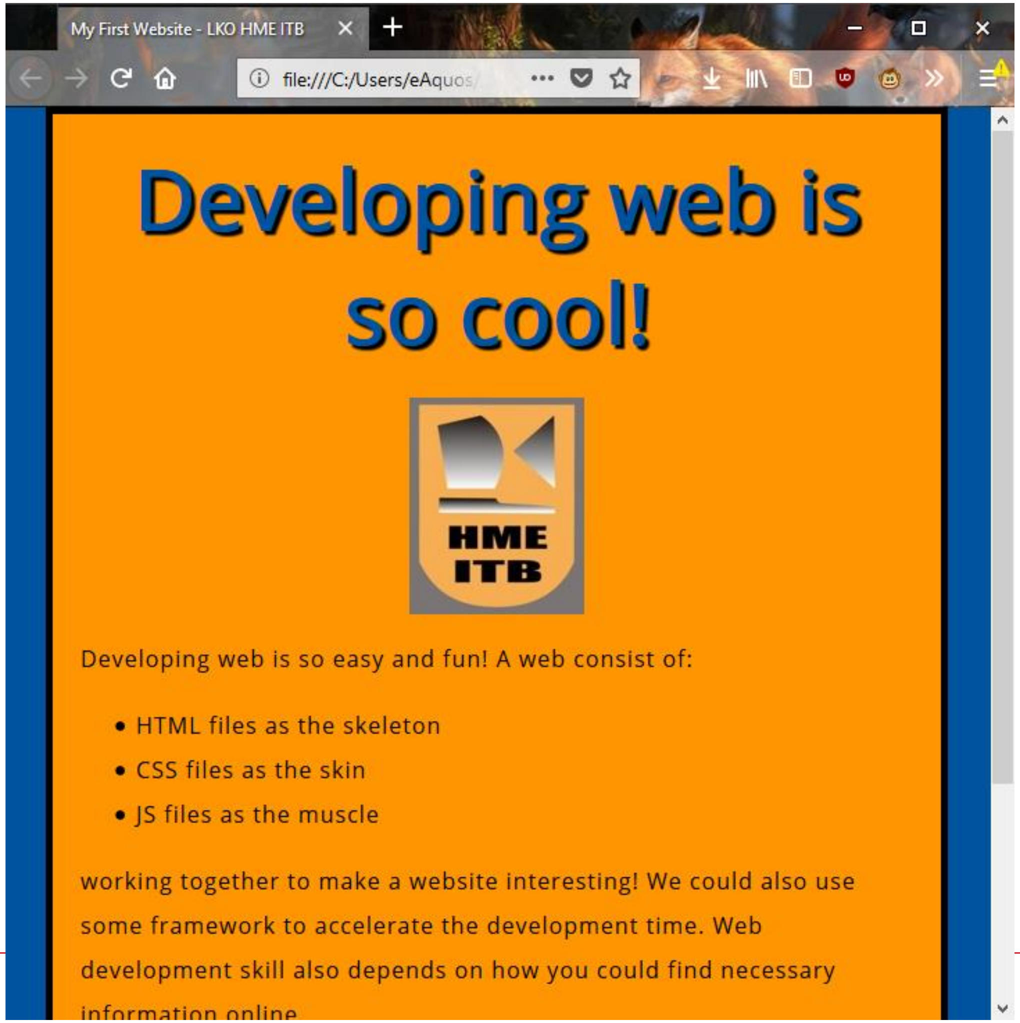
```css
h1 {
  margin: 0;
  padding: 20px 0;
  color: #00539F;
  text-shadow: 3px 3px 1px black;
}
```

Centering the Image



```
img {
  display: block;
  margin: 0 auto;
}
```

Let’s Build This!



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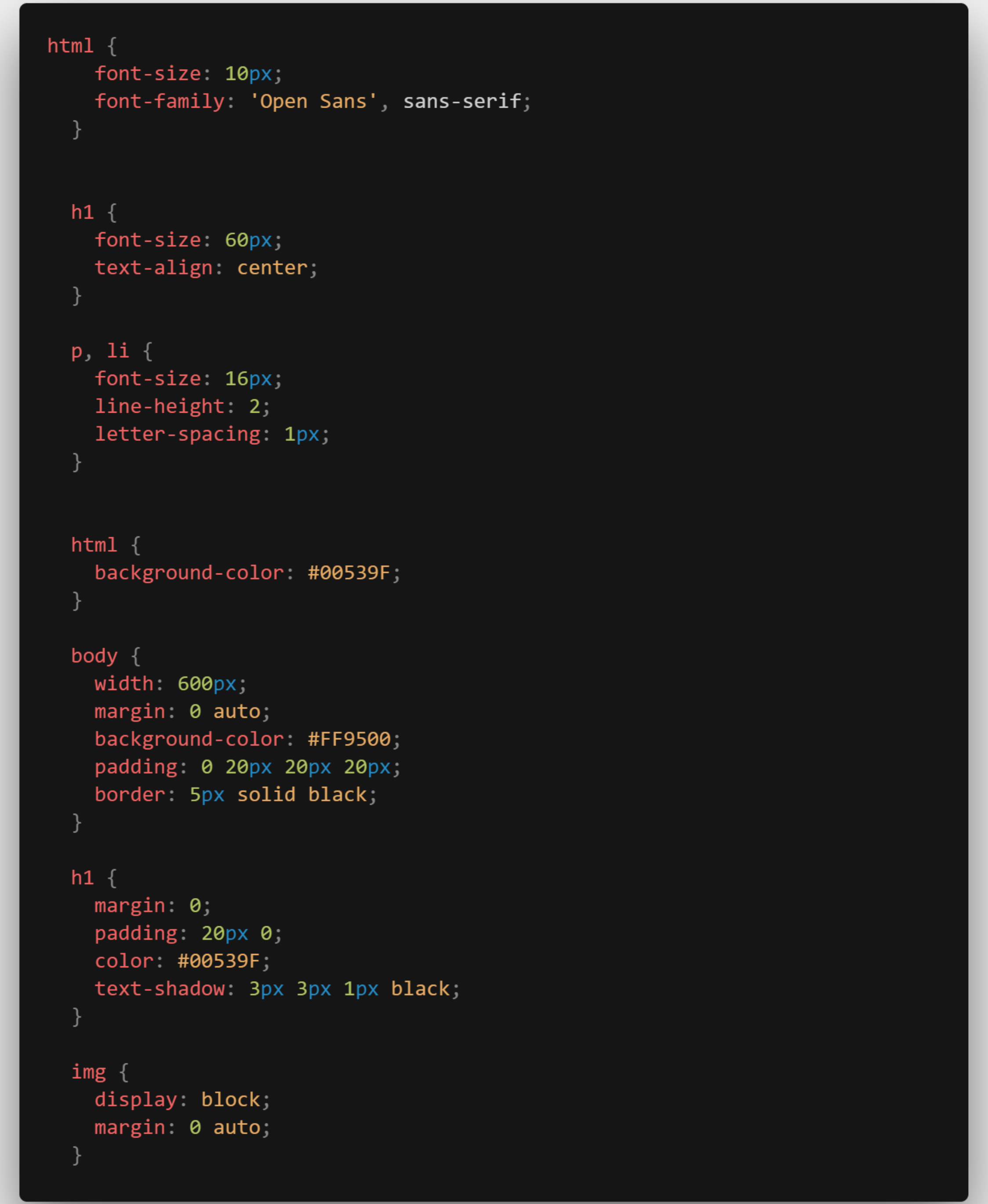


```css
html {
    font-size: 10px;
    font-family: 'Open Sans', sans-serif;
  }


  h1 {
    font-size: 60px;
    text-align: center;
  }

  p, li {
    font-size: 16px;
    line-height: 2;
    letter-spacing: 1px;
  }


  html {
    background-color: #00539F;
  }

  body {
    width: 600px;
    margin: 0 auto;
    background-color: #FF9500;
    padding: 0 20px 20px 20px;
    border: 5px solid black;
  }

  h1 {
    margin: 0;
    padding: 20px 0;
    color: #00539F;
    text-shadow: 3px 3px 1px black;
  }

  img {
    display: block;
    margin: 0 auto;
  }
```

JavaScript
The Muscle of Our Website

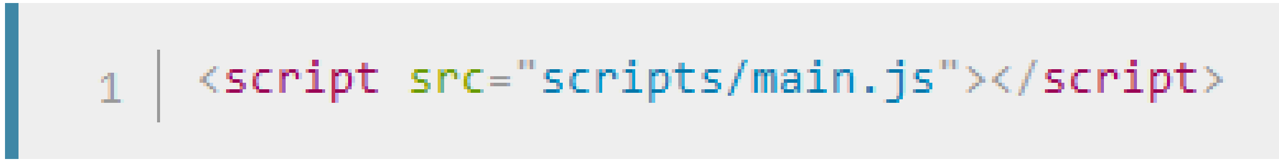
Let’s make our website more dynamic and Interactive!

What is JavaScript

- JavaScript (JS) is a full-fledged dynamic programming language that, when applied to an HTML document, can provide dynamic interactivity on websites.
- JavaScript is incredibly versatile. You can start small, with carousels, image galleries, fluctuating layouts, and responses to button clicks.
- With more experience, you'll be able to create games, animated 2D and 3D graphics, comprehensive database-driven apps, and much more!

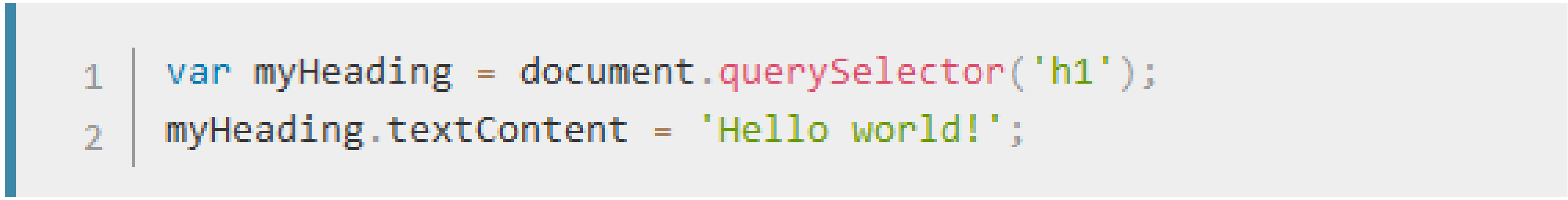
The infamous “Hello World”

- Create new file `scripts/main.js`
- Inside `index.html` add this line just before </body> tag



```
<script src="scripts/main.js"></script>
```

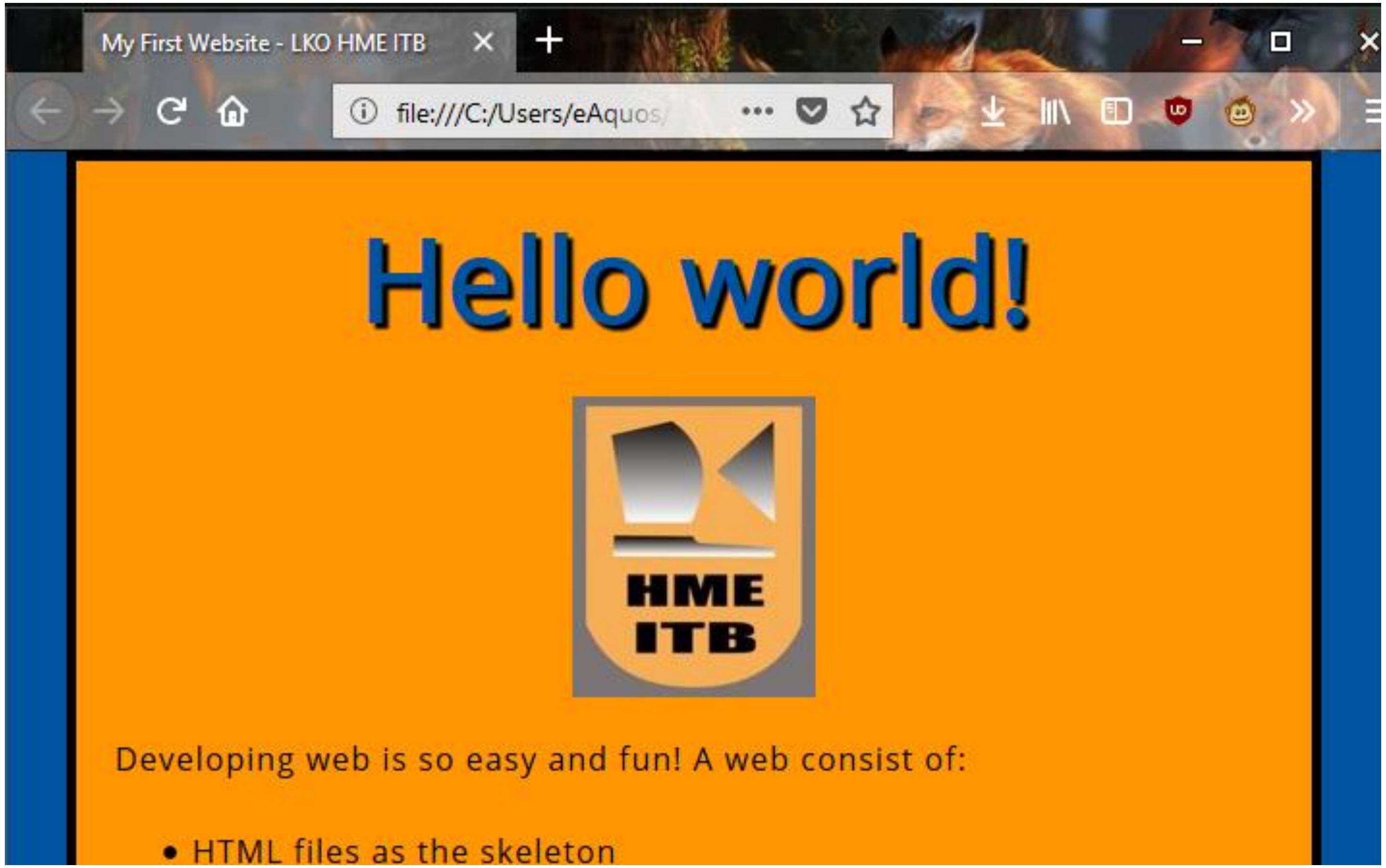
- Now, add this code into `main.js`



```
var myHeading = document.querySelector('h1');
myHeading.textContent = 'Hello world!';
```

- Then refresh and see what happened!

The infamous “Hello World”

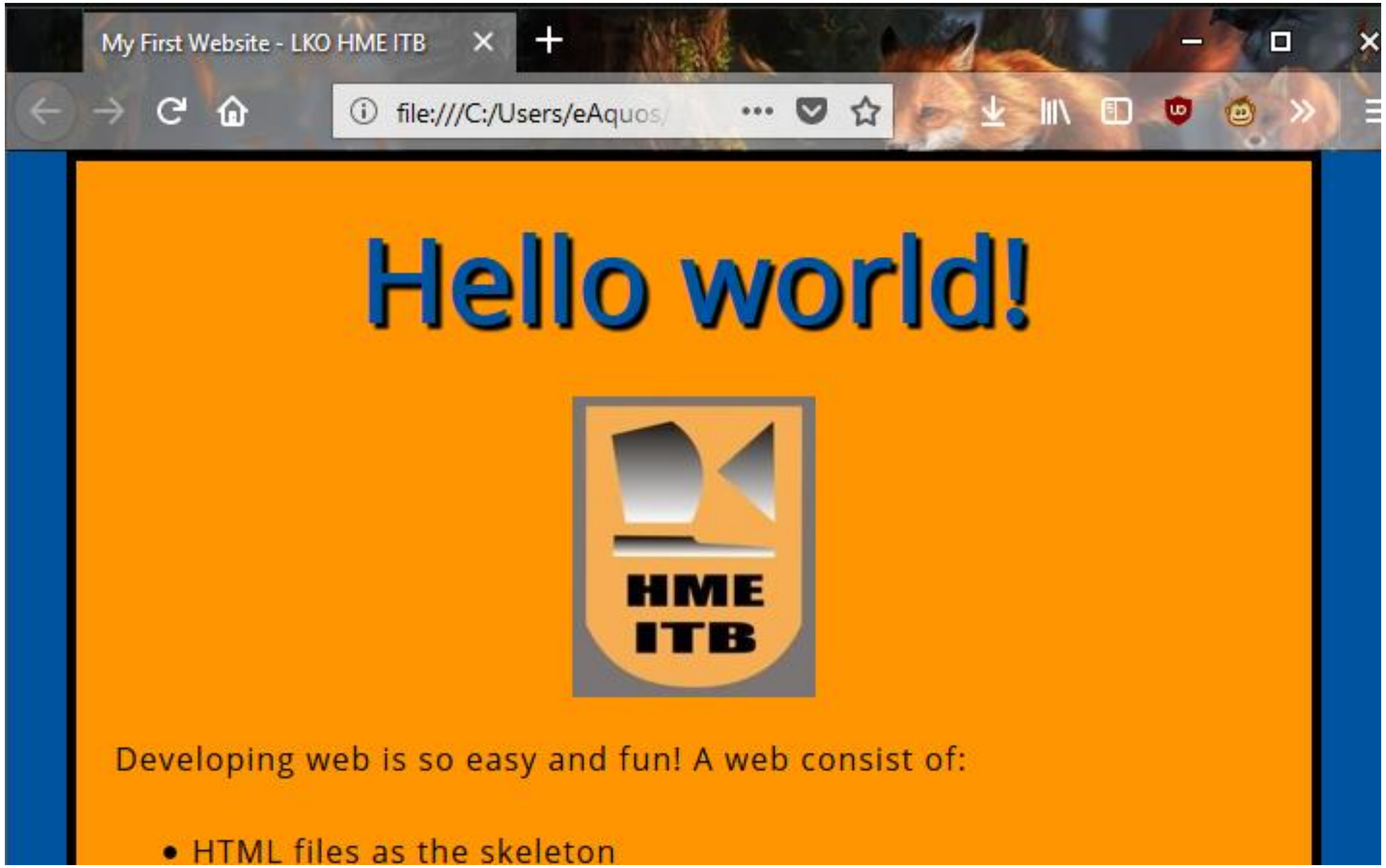


Hello world!

Developing web is so easy and fun! A web consist of:

- HTML files as the skeleton

The infamous “Hello World”

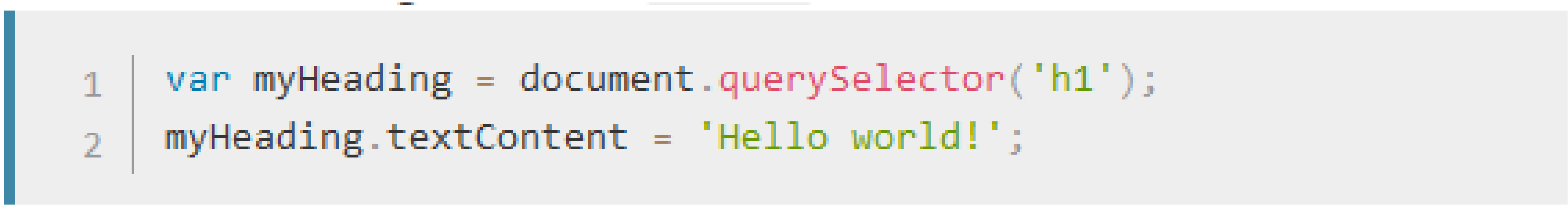


Hello world!

Developing web is so easy and fun! A web consist of:

- HTML files as the skeleton

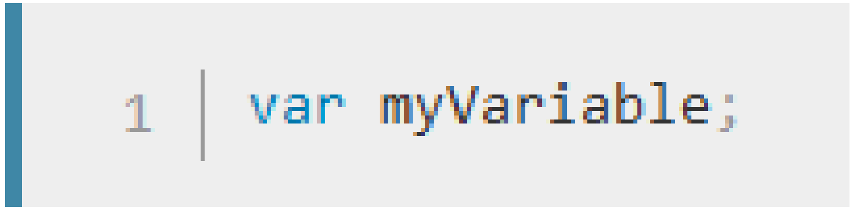
Do you wonder what we did?



```
var myHeading = document.querySelector('h1');
myHeading.textContent = 'Hello world!';
```

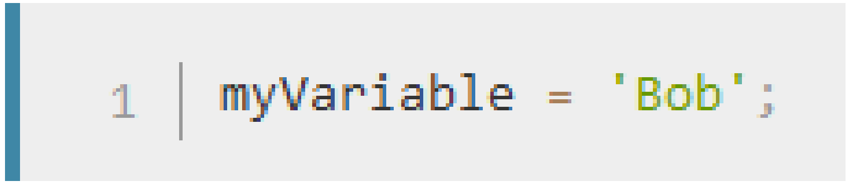
JS Crash Course: Variable

Declaring Variable



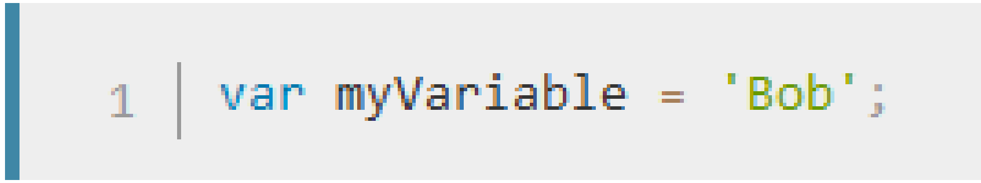
```
var myVariable;
```

Defining Variable



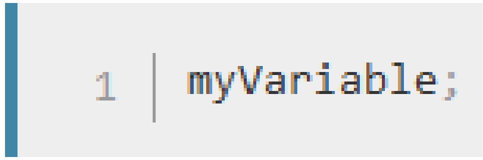
```
myVariable = 'Bob';
```

Both at the same line



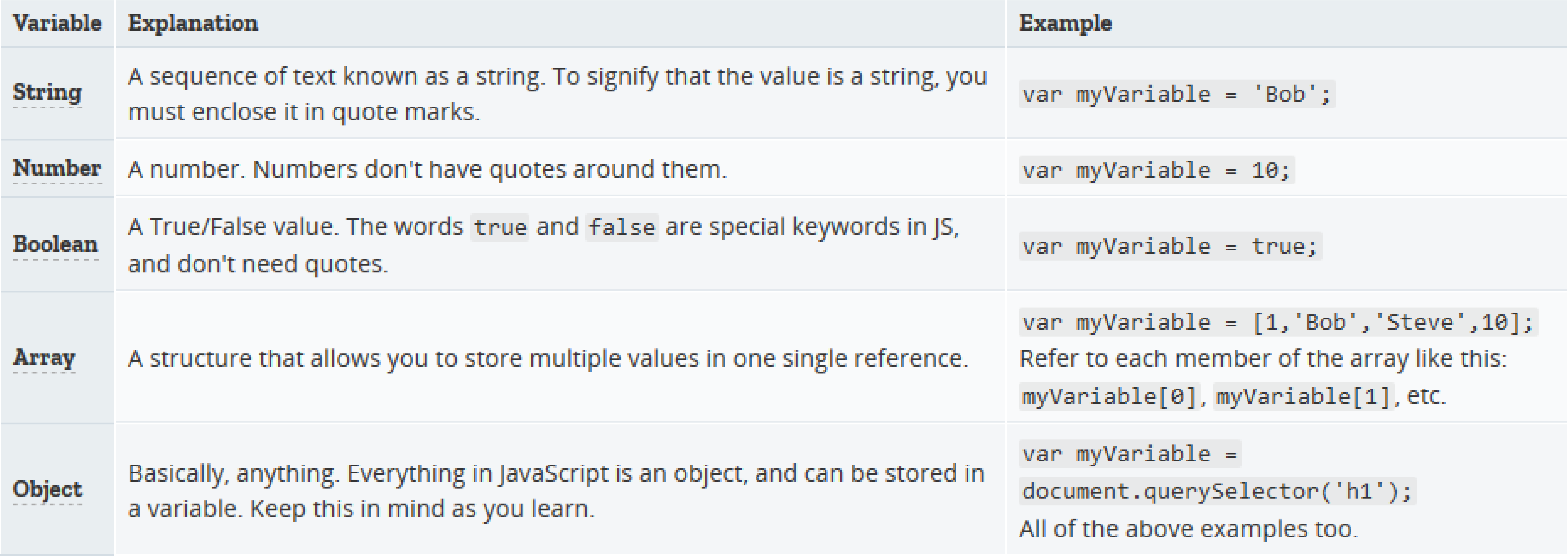
```
var myVariable = 'Bob';
```

Accessing Variable



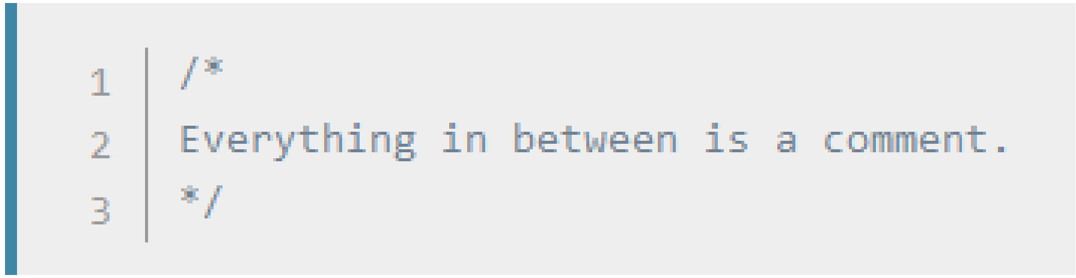
```
myVariable;
```

JS Crash Course: Variable

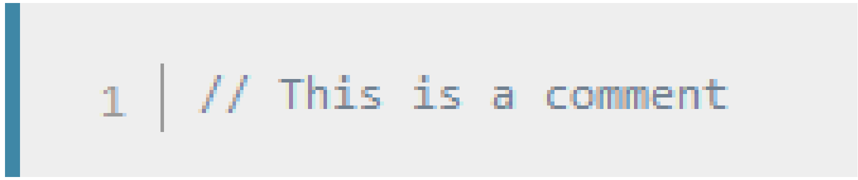


Variable	Explanation	Example
String	A sequence of text known as a string. To signify that the value is a string, you must enclose it in quote marks.	`var myVariable = 'Bob';`
Number	A number. Numbers don't have quotes around them.	`var myVariable = 10;`
Boolean	A True/False value. The words `true` and `false` are special keywords in JS, and don't need quotes.	`var myVariable = true;`
Array	A structure that allows you to store multiple values in one single reference.	`var myVariable = [1,'Bob','Steve',10];` Refer to each member of the array like this: `myVariable[0]`, `myVariable[1]`, etc.
Object	Basically, anything. Everything in JavaScript is an object, and can be stored in a variable. Keep this in mind as you learn.	`var myVariable = document.querySelector('h1');` All of the above examples too.

JS Crash Course: Comment

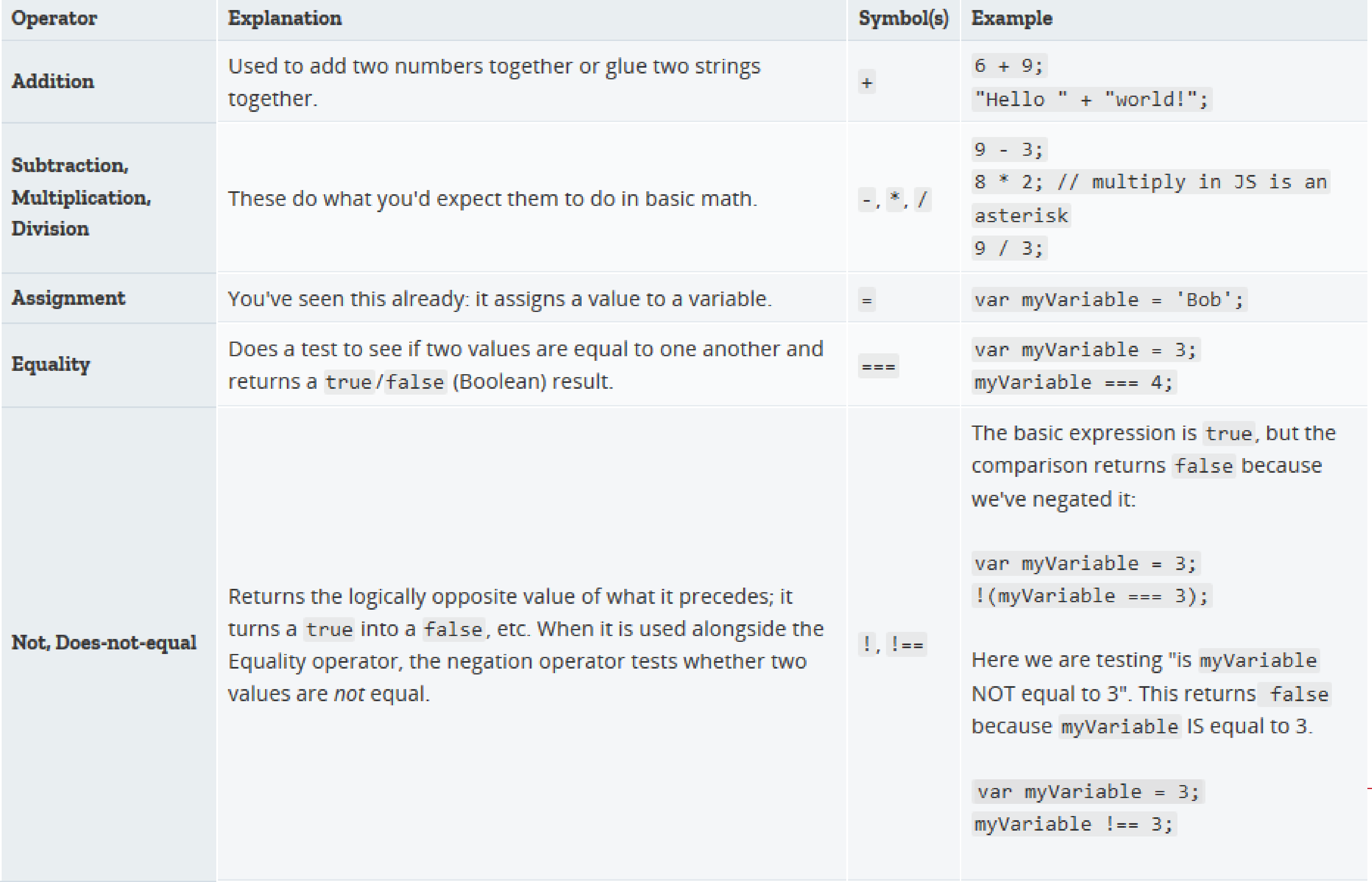


```
/*
Everything in between is a comment.
*/
```



```
// This is a comment
```

JS Crash Course: Operator



Operator	Explanation	Symbol(s)	Example

Addition	Used to add two numbers together or glue two strings together.	`+`	`6 + 9;`
			`"Hello " + "world!";`

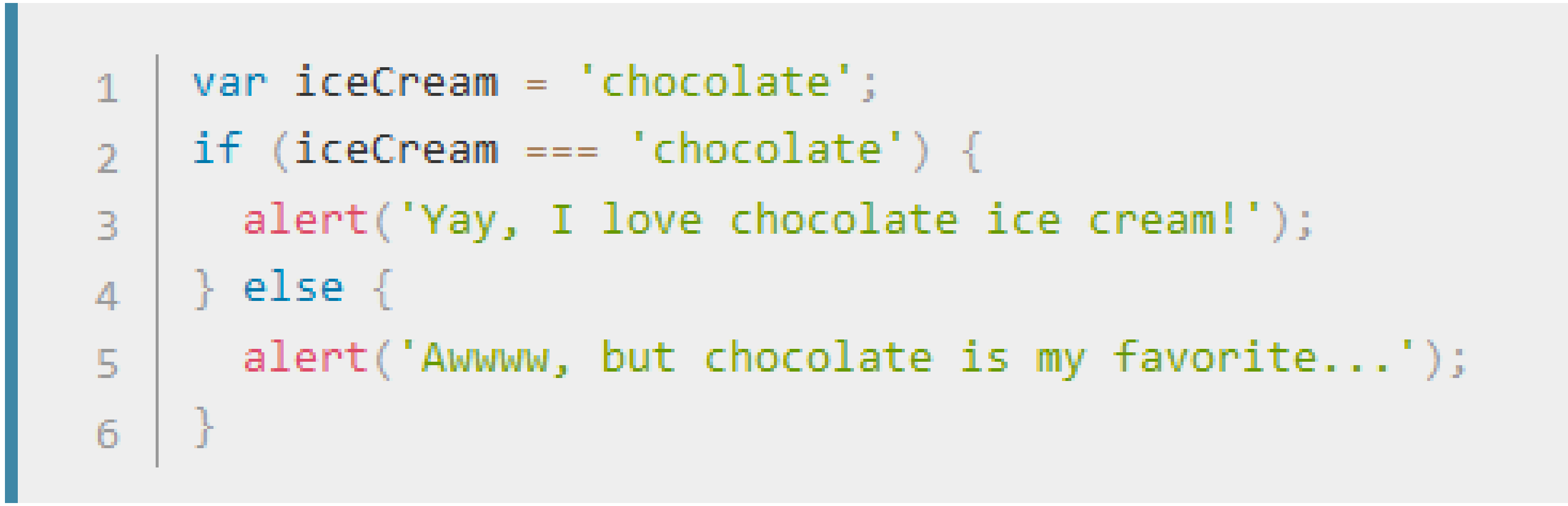
Subtraction, Multiplication, Division	These do what you'd expect them to do in basic math.	`-`, `*`, `/`	`9 - 3;`
			`8 * 2; // multiply in JS is an asterisk`
			`9 / 3;`

Assignment	You've seen this already: it assigns a value to a variable.	`=`	`var myVariable = 'Bob';`

Equality	Does a test to see if two values are equal to one another and returns a `true`/`false` (Boolean) result.	`===`	`var myVariable = 3;`
			`myVariable === 4;`

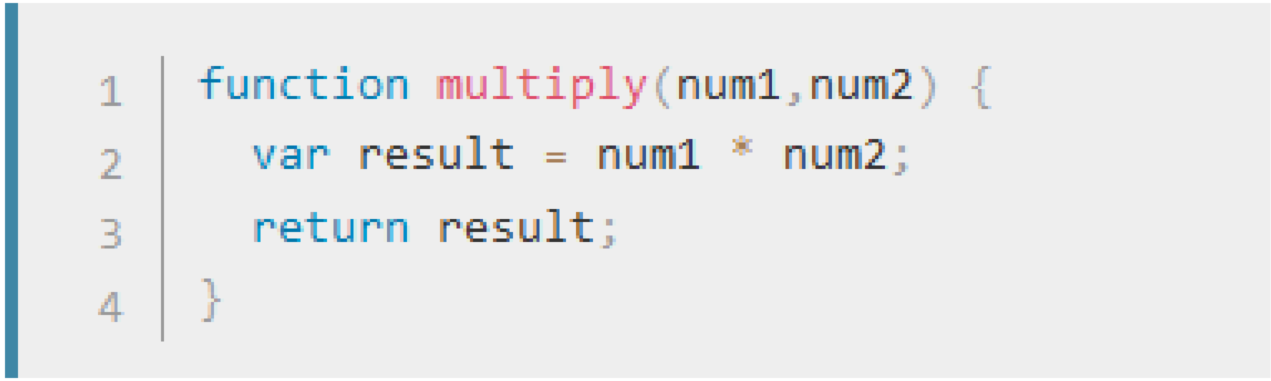
Not, Does-not-equal	Returns the logically opposite value of what it precedes; it turns a `true` into a `false`, etc. When it is used alongside the Equality operator, the negation operator tests whether two values are *not* equal.	`!`, `!==`	The basic expression is `true`, but the comparison returns `false` because we've negated it:
			
			`var myVariable = 3;`
			`!(myVariable === 3);`
			
			Here we are testing "is `myVariable` NOT equal to 3". This returns `false` because `myVariable` IS equal to 3.
			
			`var myVariable = 3;`
			`myVariable !== 3;`

JS Crash Course: Conditional

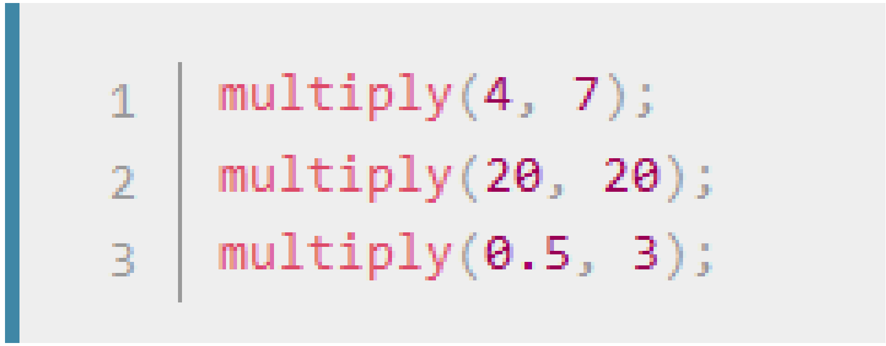


```javascript
var iceCream = 'chocolate';
if (iceCream === 'chocolate') {
  alert('Yay, I love chocolate ice cream!');
} else {
  alert('Awwww, but chocolate is my favorite...');
}
```

JS Crash Course: Function



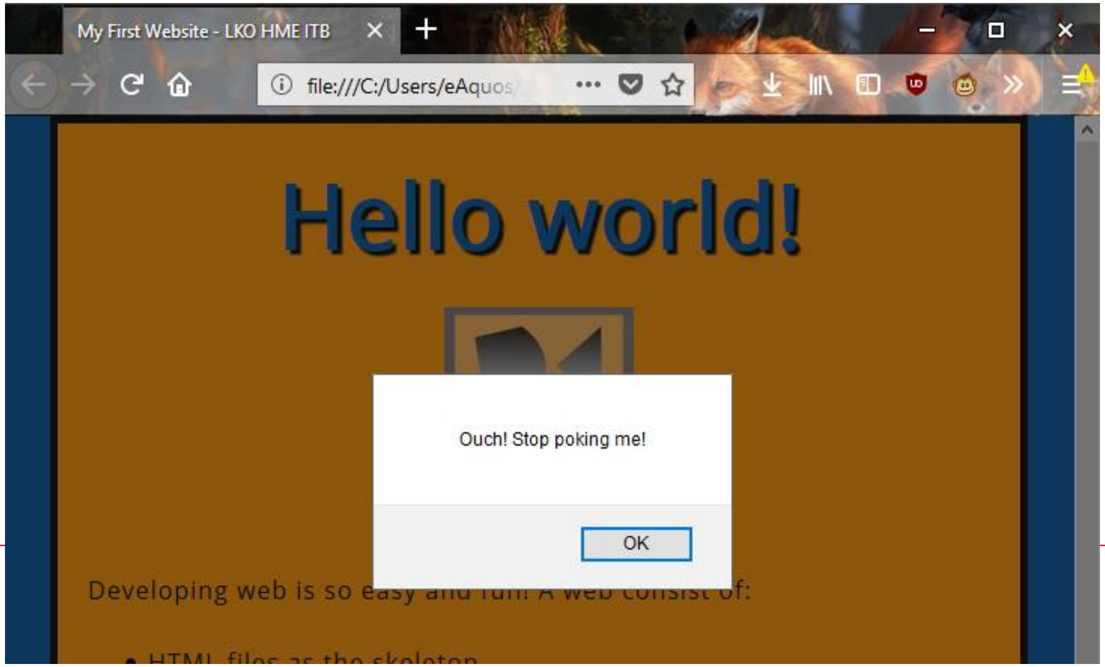
```
function multiply(num1,num2) {
  var result = num1 * num2;
  return result;
}
```



```
multiply(4, 7);
multiply(20, 20);
multiply(0.5, 3);
```

JS Crash Course: Events

```
document.querySelector('html').onclick = function() {
    alert('Ouch! Stop poking me!');
}
```



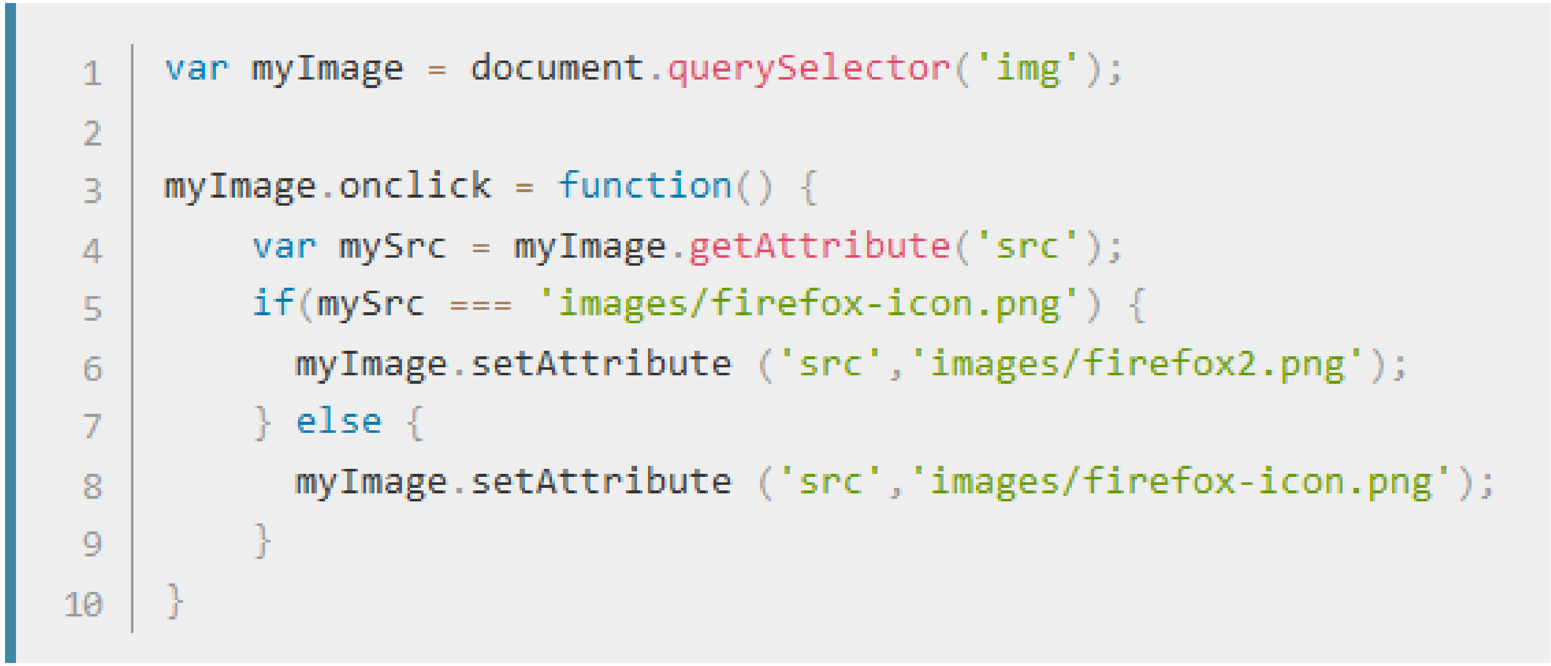
Hello world!

Ouch! Stop poking me!

Developing web is so easy and fun! A web consist of:

- HTML files as the skeleton

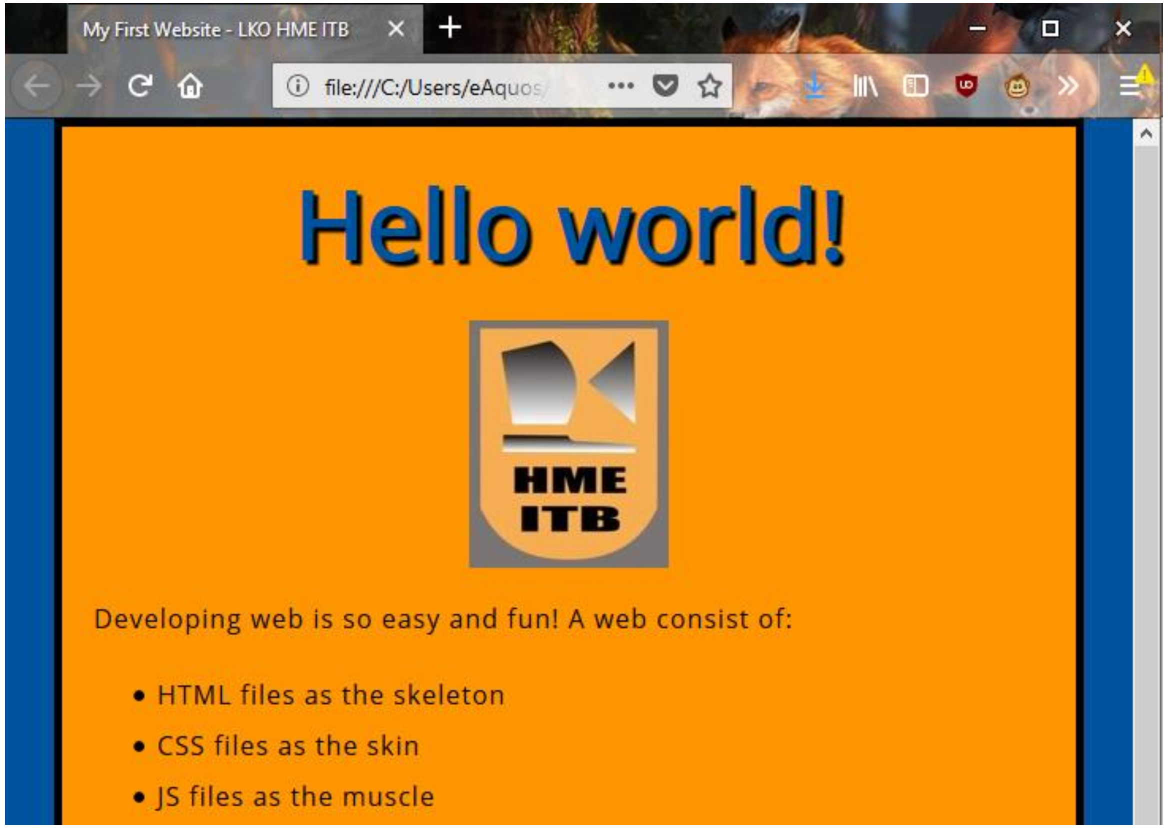
Change the Image



```
var myImage = document.querySelector('img');

myImage.onclick = function() {
    var mySrc = myImage.getAttribute('src');
    if(mySrc === 'images/firefox-icon.png') {
      myImage.setAttribute ('src','images/firefox2.png');
    } else {
      myImage.setAttribute ('src','images/firefox-icon.png');
    }
}
```

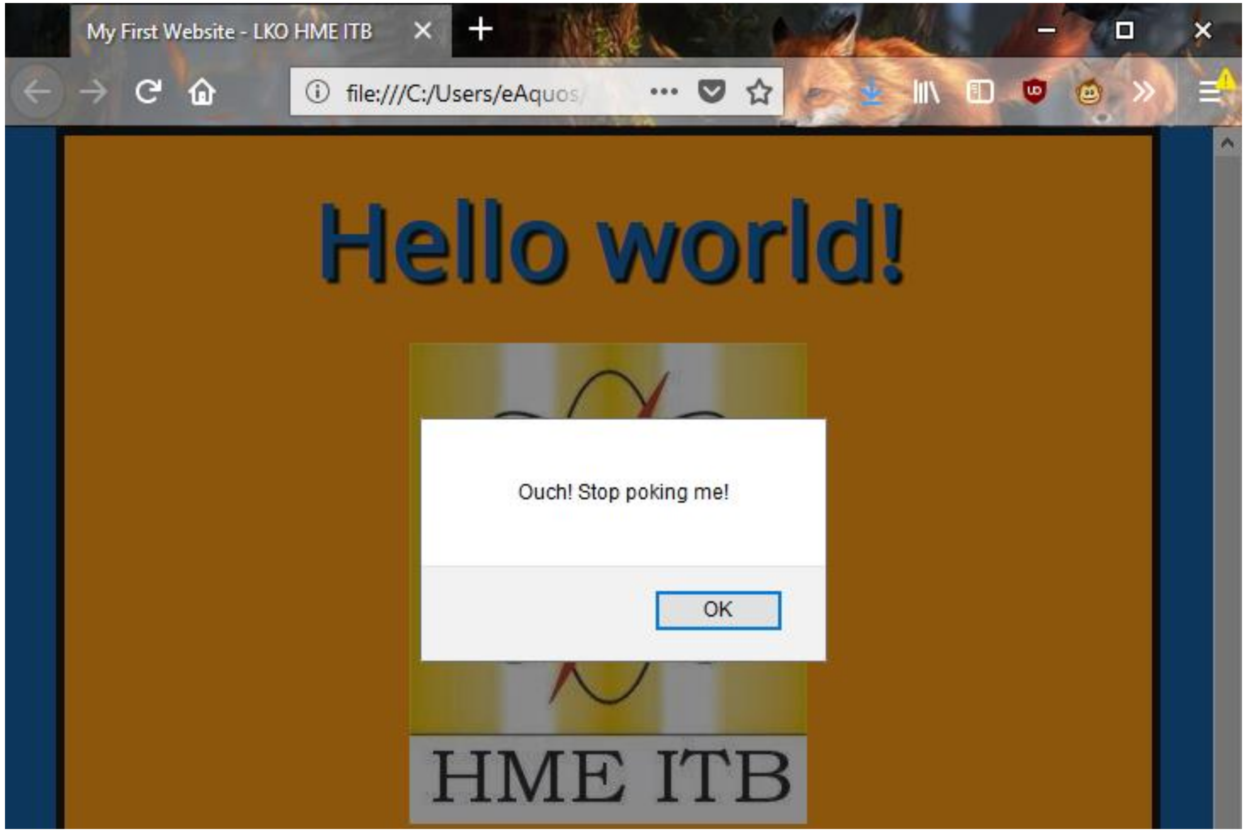
Change the Image



Hello world!

Developing web is so easy and fun! A web consist of:

- HTML files as the skeleton
- CSS files as the skin
- JS files as the muscle

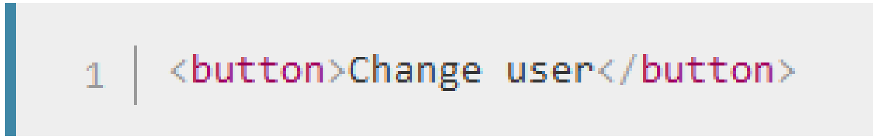


Hello world!

Ouch! Stop poking me!

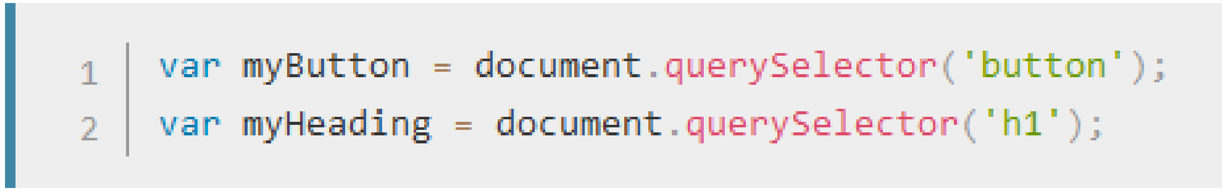
Personalized Welcome Message

- Add a button at the bottom of the html page by adding this line



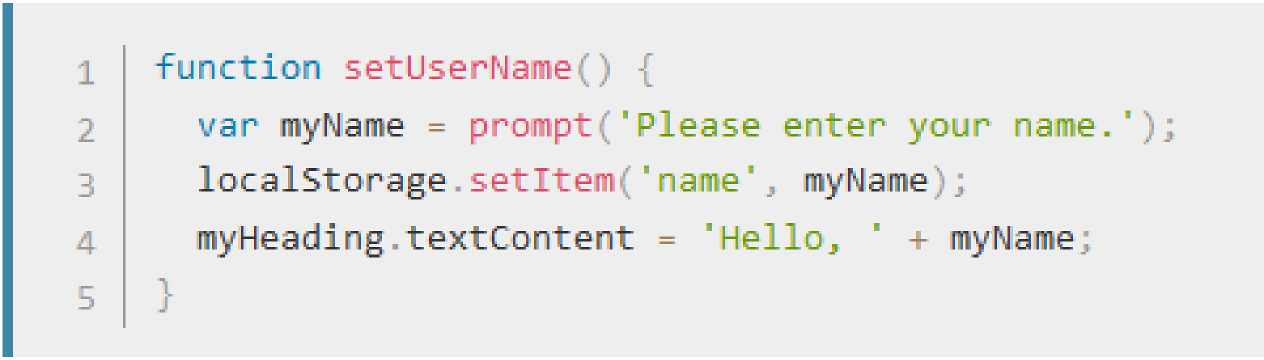
```
<button>Change user</button>
```

- In `main.js` add this line of code to select our element



```
var myButton = document.querySelector('button');
var myHeading = document.querySelector('h1');
```

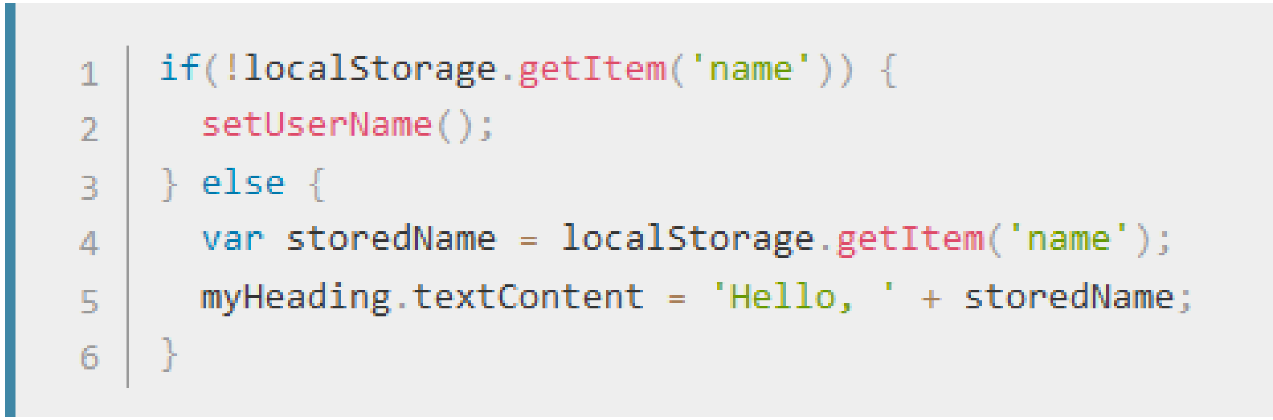
- Now, we create some function



```
function setUserName() {
  var myName = prompt('Please enter your name.');
  localStorage.setItem('name', myName);
  myHeading.textContent = 'Hello, ' + myName;
}
```

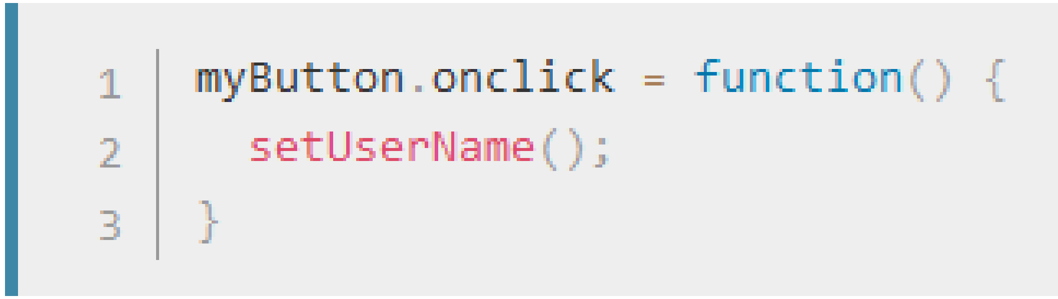
Personalized Welcome Message

- Now, we make some initialization code



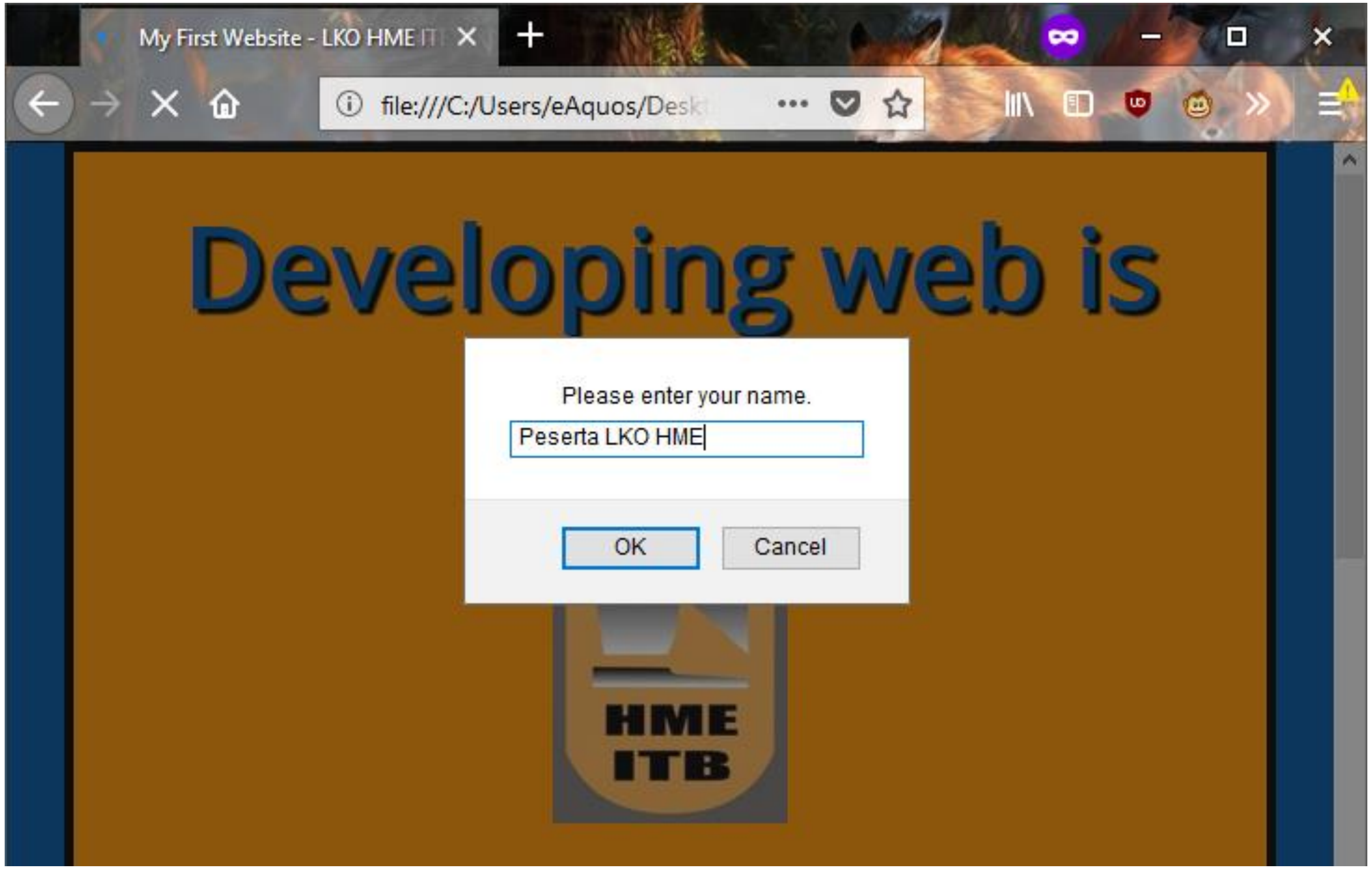
```
if(!localStorage.getItem('name')) {
  setUserName();
} else {
  var storedName = localStorage.getItem('name');
  myHeading.textContent = 'Hello, ' + storedName;
}
```

- Last, put below onclick event handler on the button to set new name!



```
myButton.onclick = function() {
  setUserName();
}
```

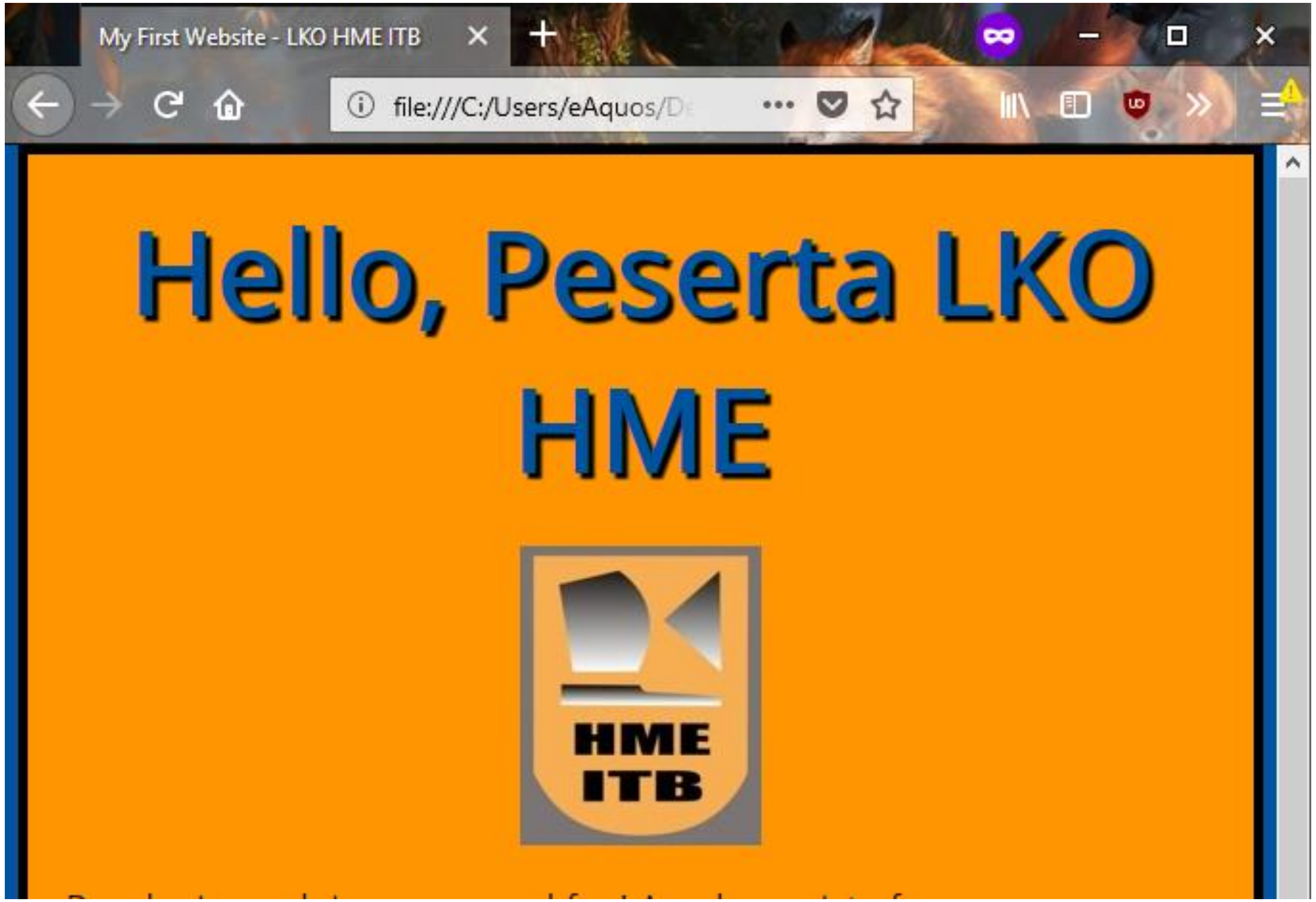
Personalized Welcome Message



Please enter your name.

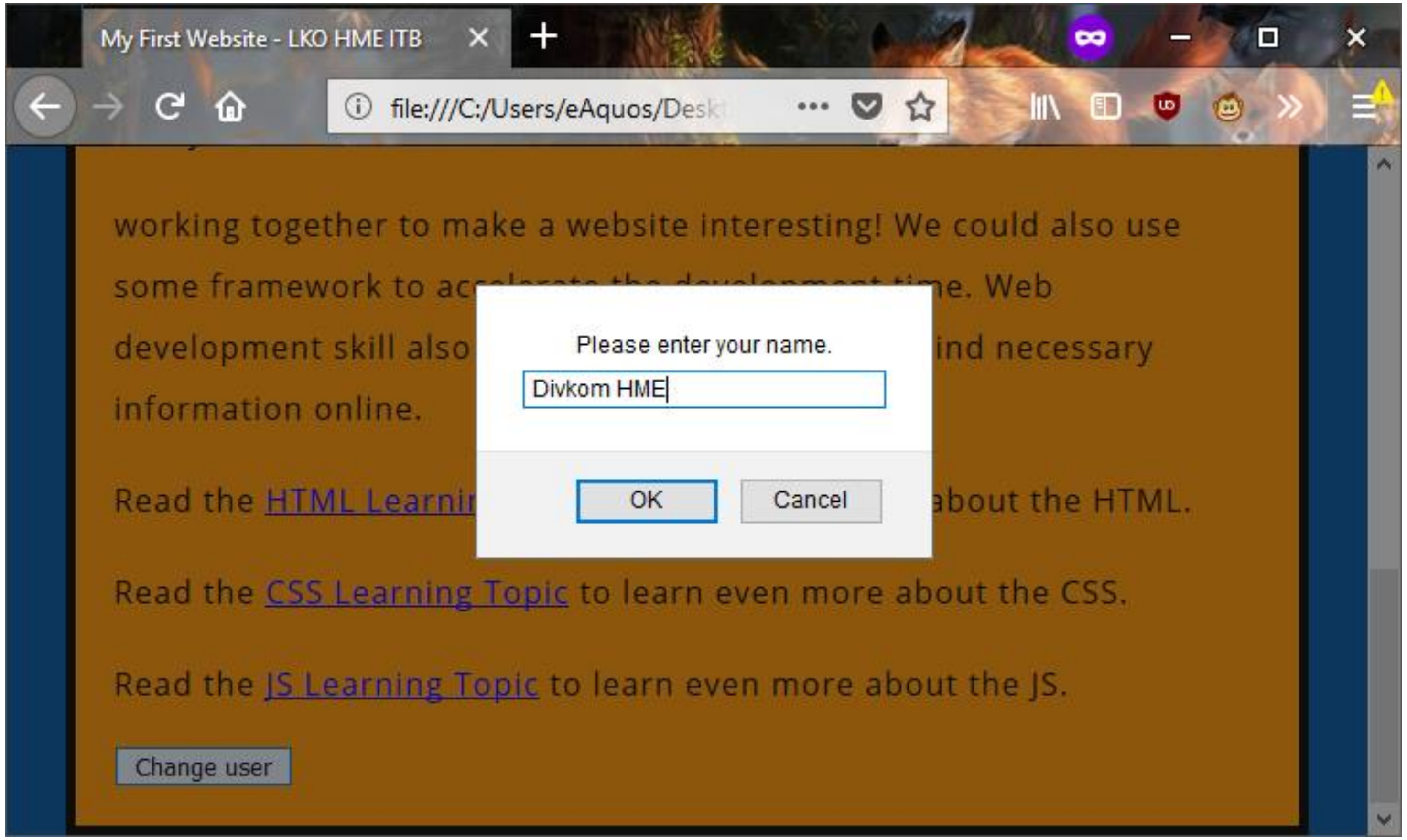
Peserta LKO HME

Personalized Welcome Message



Hello, Peserta LKO HME

Personalized Welcome Message



working together to make a website interesting! We could also use some framework to ac... e. Web development skill also ... ind necessary information online.

Please enter your name.

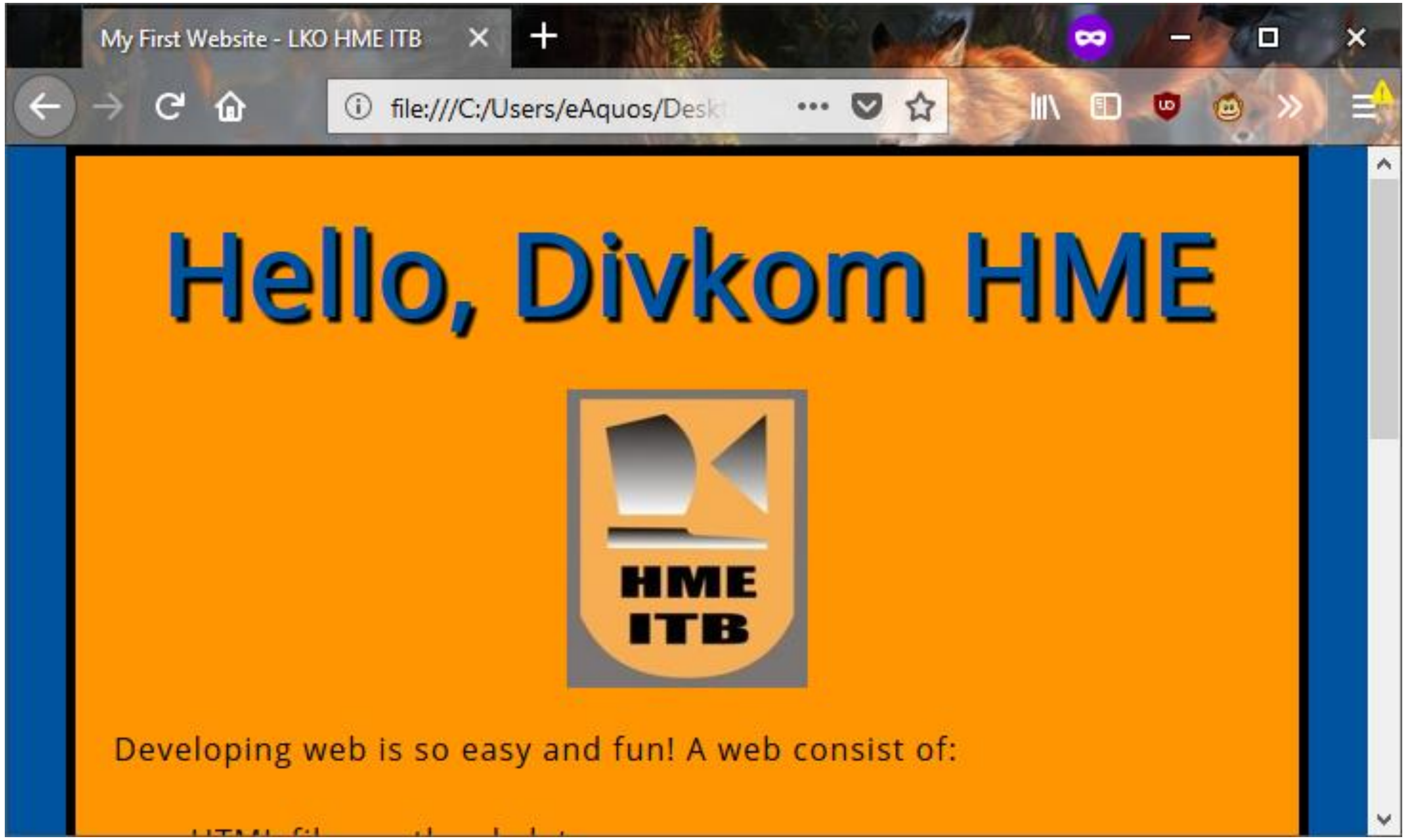
Divkom HME

Read the HTML Learni... about the HTML.

Read the CSS Learning Topic to learn even more about the CSS.

Read the JS Learning Topic to learn even more about the JS.

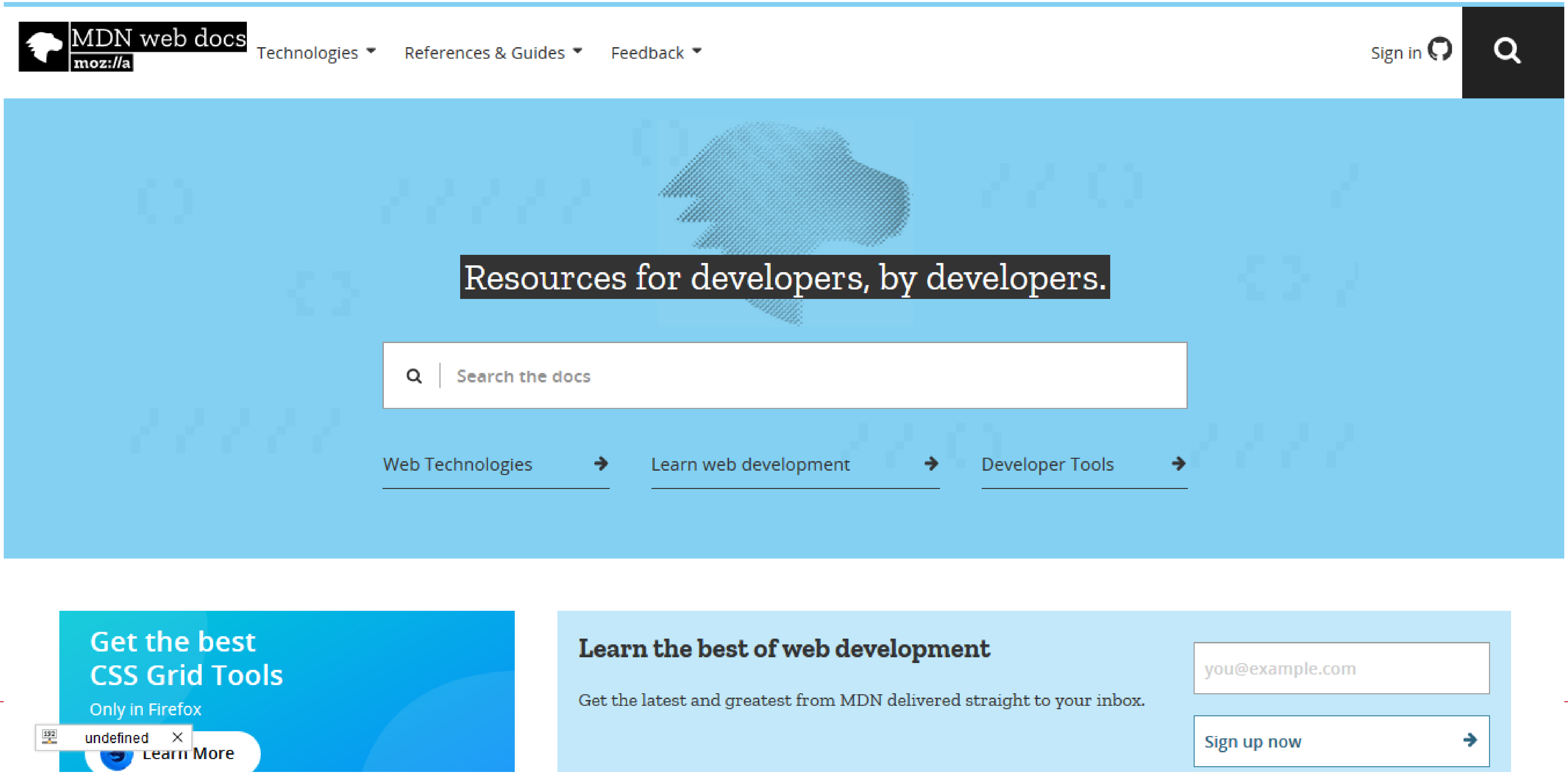
Personalized Welcome Message



Hello, Divkom HME

Developing web is so easy and fun! A web consist of:

More Resource



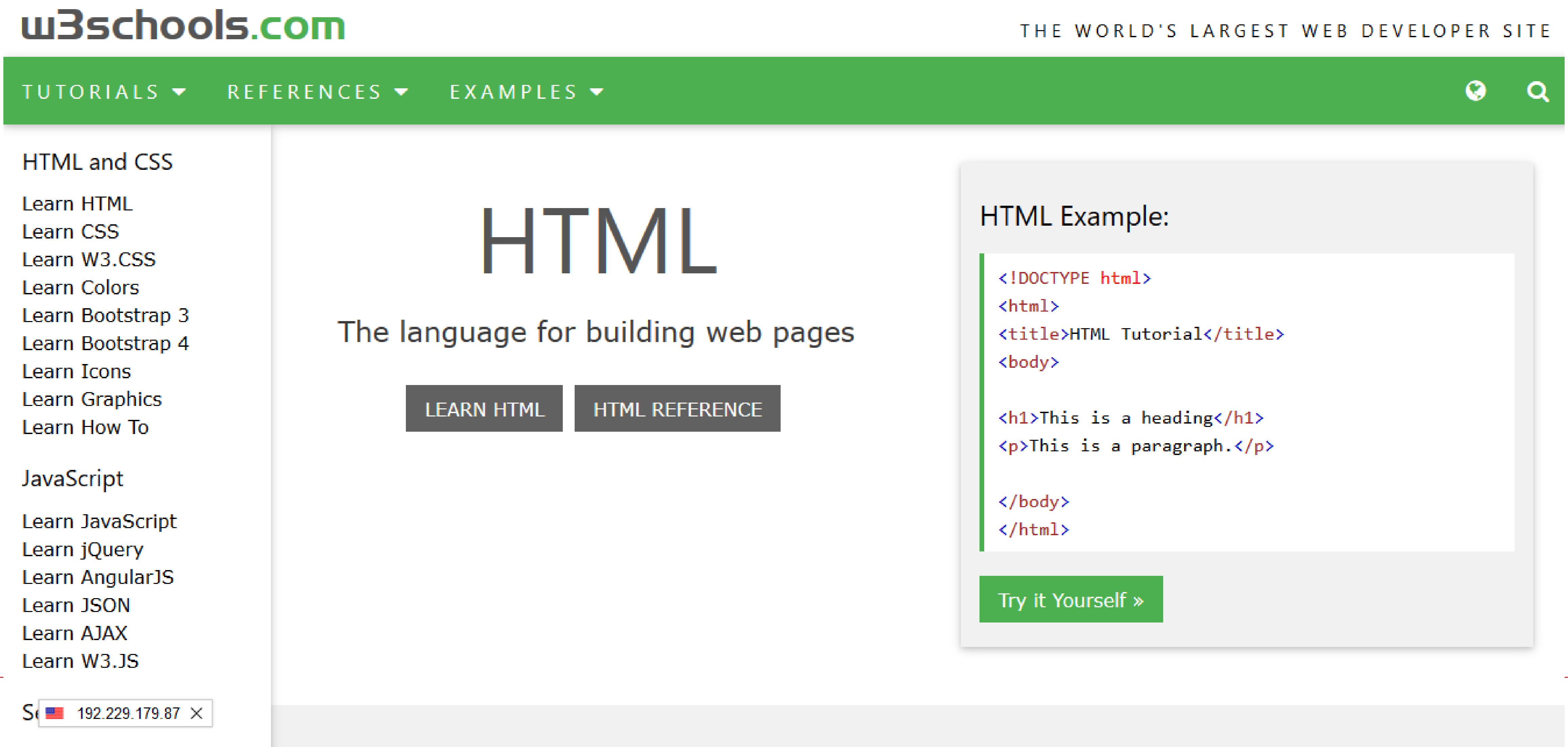
Resources for developers, by developers.

Get the best CSS Grid Tools

Learn the best of web development

Get the latest and greatest from MDN delivered straight to your inbox.

More Resource



HTML and CSS

Learn HTML
Learn CSS
Learn W3.CSS
Learn Colors
Learn Bootstrap 3
Learn Bootstrap 4
Learn Icons
Learn Graphics
Learn How To

JavaScript

Learn JavaScript
Learn jQuery
Learn AngularJS
Learn JSON
Learn AJAX
Learn W3.JS

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HTML

The language for building web pages

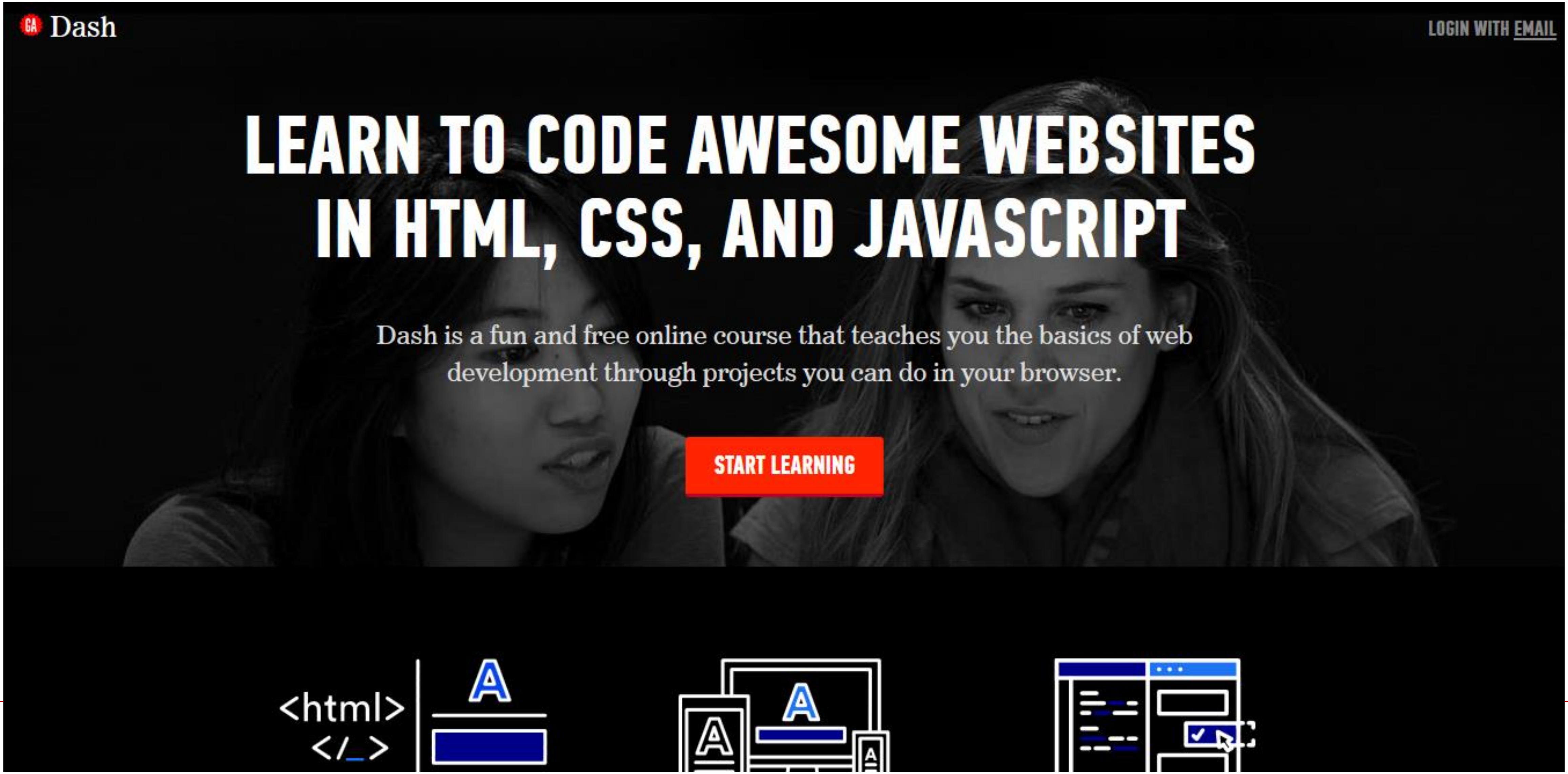
HTML Example:

```
<!DOCTYPE html>
<html>
<title>HTML Tutorial</title>
<body>

<h1>This is a heading</h1>
<p>This is a paragraph.</p>

</body>
</html>
```

More Resource



LEARN TO CODE AWESOME WEBSITES IN HTML, CSS, AND JAVASCRIPT

Dash is a fun and free online course that teaches you the basics of web development through projects you can do in your browser.

More Resource

- Audio Visual Resources:

There and Back Again: A Packet's Tale
How Internet Works in 5 minutes
Web Demystified
Web Development tutorial for Beginners

- Futher Readings (If you like Reading more!):

How does the Internet Works by MDN
Getting started with the Web by MDN
Learn HTML Pathway by MDN
Learn CSS Pathway by MDN
Learn JS Pathway by MDN

The End of Our Journey

Thank you for all your attention! Probably all of this is very comprehensive and tiring to follow. But, worry not because you can review the code later!

This is the introduction to the Front-end Web Development. But, only using this knowledge and a little more effort you can build professional Website in no time! Cool isn't it?

Building website is simple, the most complex part of building a website is solving real problem. Don't let creativity dies inside your head! After all what you need is only text editor, internet connection, and some drinks!