

An Introduction to Website Design

Basics of HTML and
CSS programming

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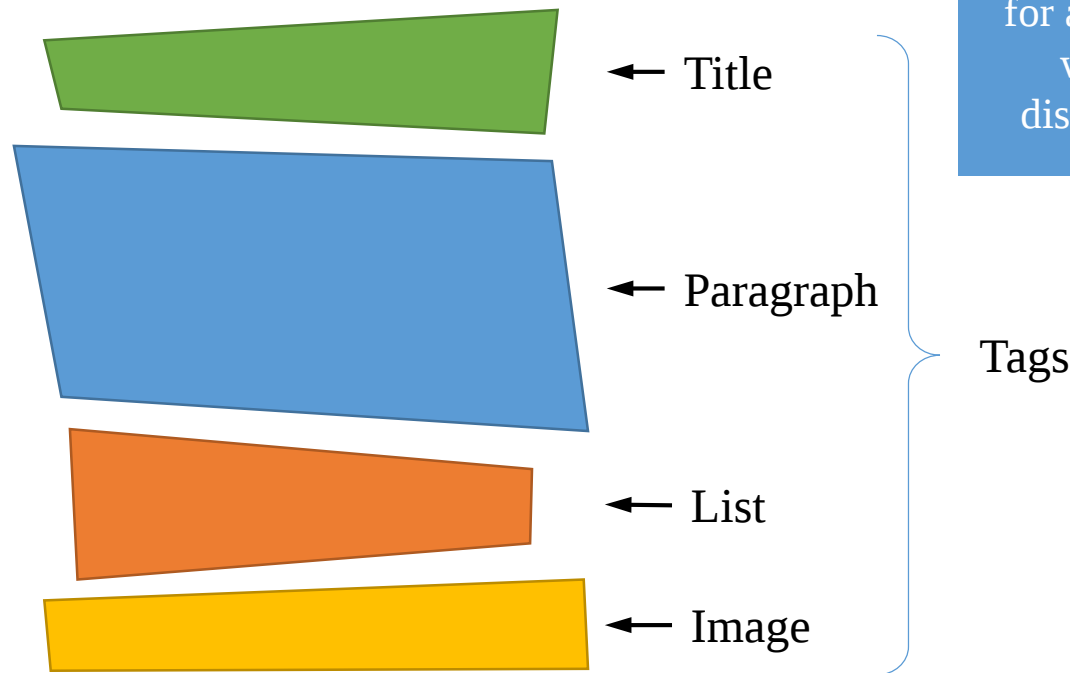
06/15/16



Lecture

What is HTML

HTML (**H**yper **T**ext **M**arkup **L**anguage) is a markup language for describing web documents



A markup language is a system for annotating a document in a way that is syntactically distinguishable from the text

HTML Tags

HTML tags are keywords (tag names) surrounded by angle brackets

`<tagname> content </tagname>`

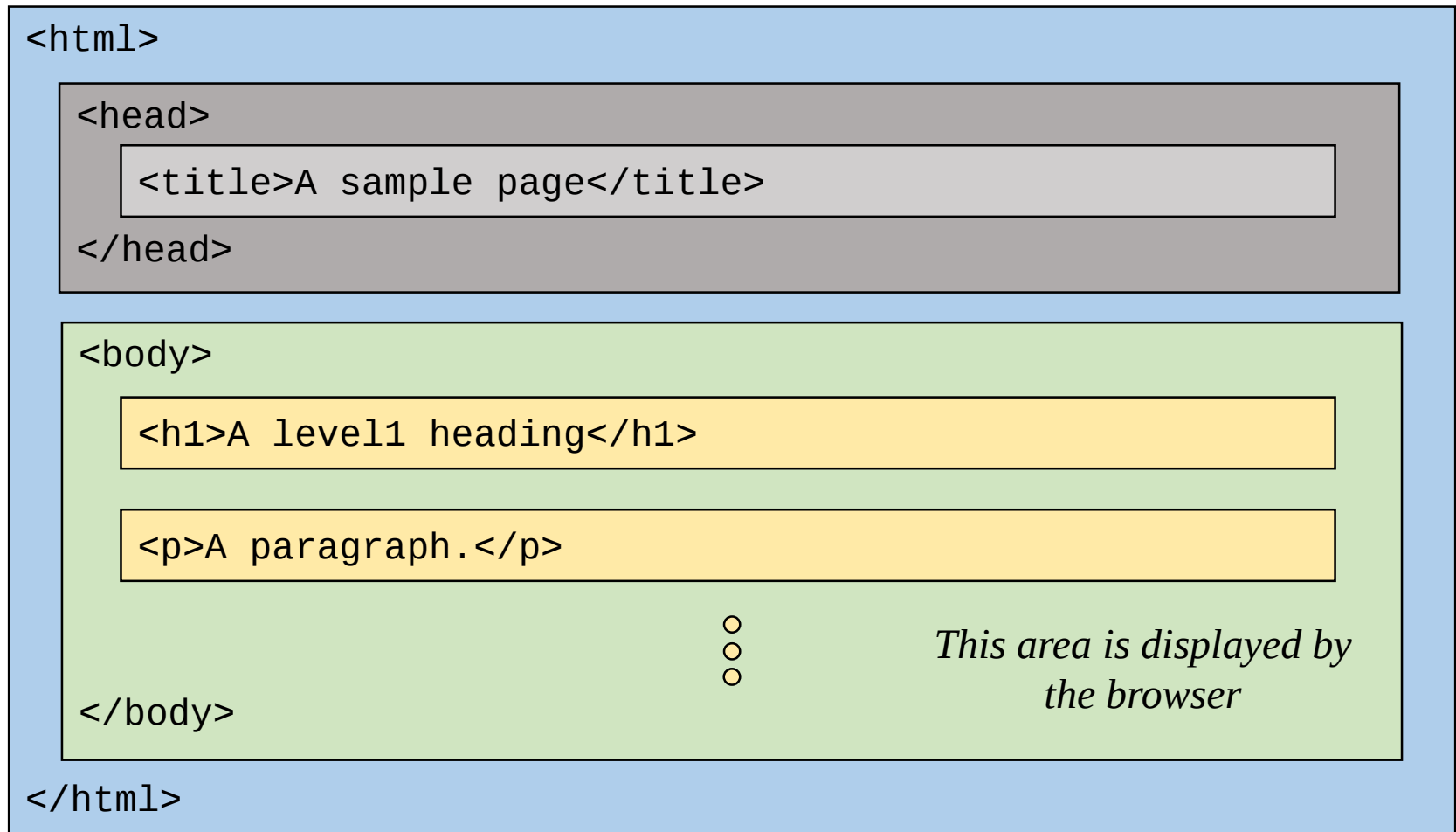
↑
Start Tag
or
Opening Tag

↑
End Tag
or
Closing Tag

Some Common HTML Tags

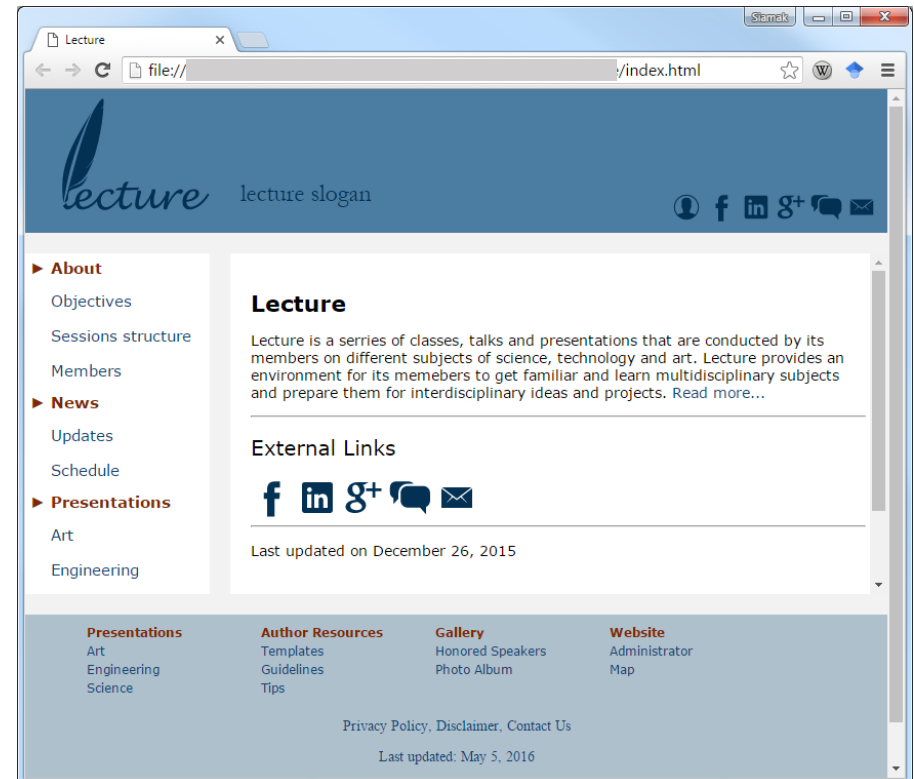
<code>html</code>	Describes an HTML document
<code>head</code>	To provide information about the document
<code>title</code>	Provides a title for a document
<code>body</code>	The visible web document contents
<code>h1, h2, ..., h6</code>	Heading level 1, 2, ... 6
<code>p</code>	Paragraph
<code>br</code>	A single line break
<code><!-- ... --></code>	Comment

HTML Page Structure



Web Browsers

A web browser (e.g. Chrome, IE, Firefox, Safari) uses HTML tags to determine how to display the web documents.

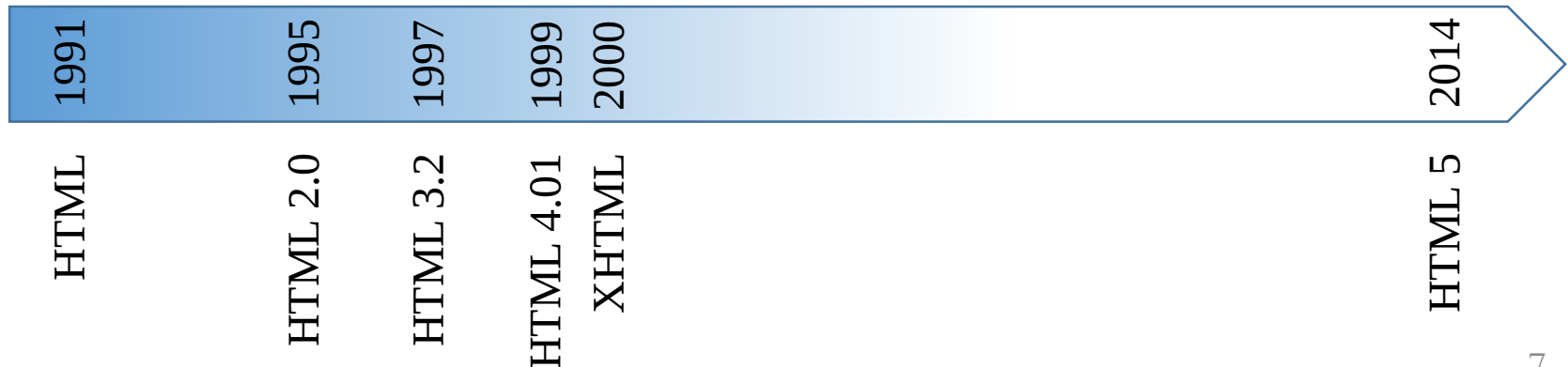


<!DOCTYPE> Declaration

<!DOCTYPE> defines the document type

HTML 5 Declarations: <!DOCTYPE html>

HTML Versions:



First Simple Example

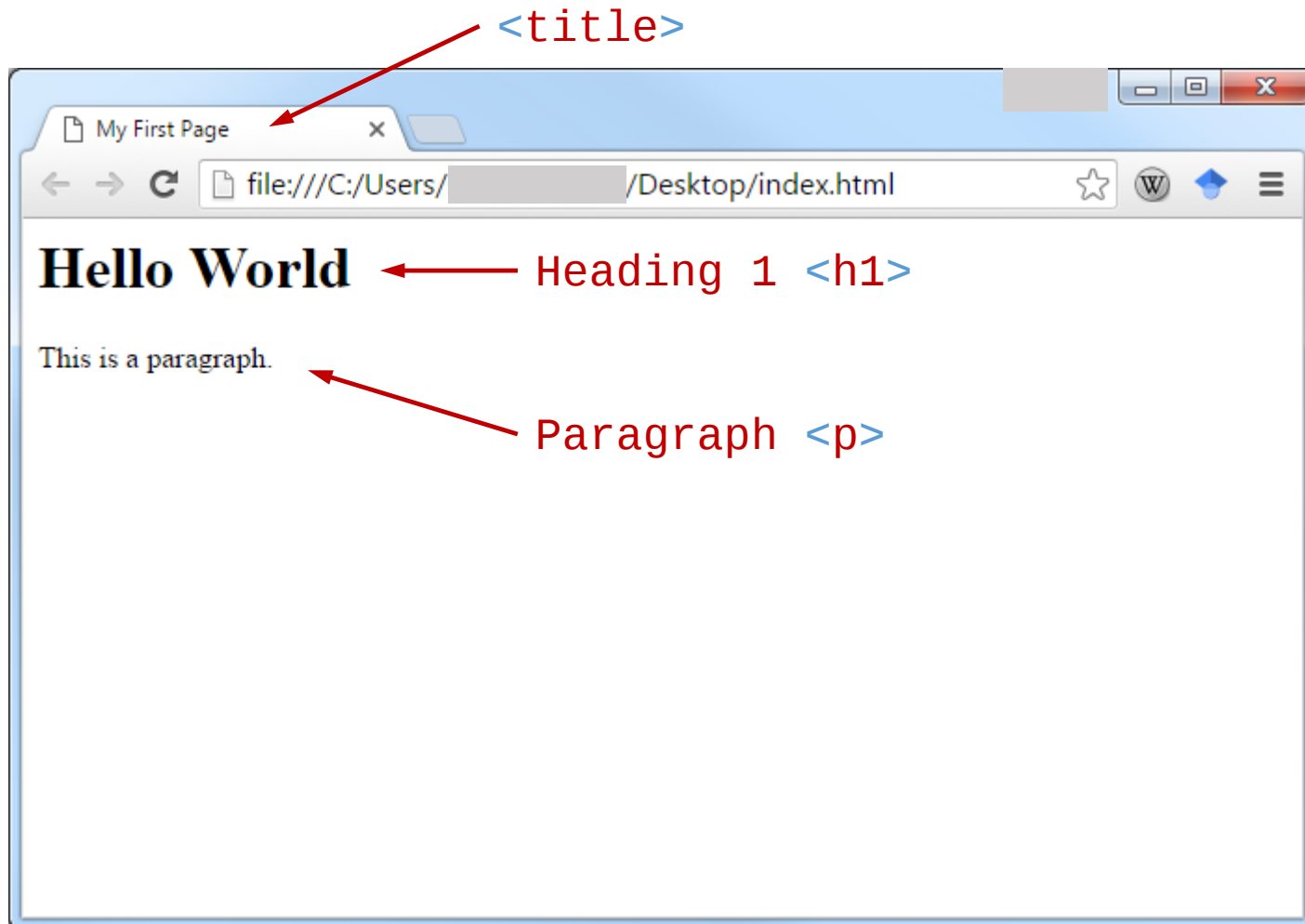
- 1) Open Notepad
- 2) Type the following code:

```
<!DOCTYPE html>
<html>
  <head>
    <title>My First Page</title>
  </head>

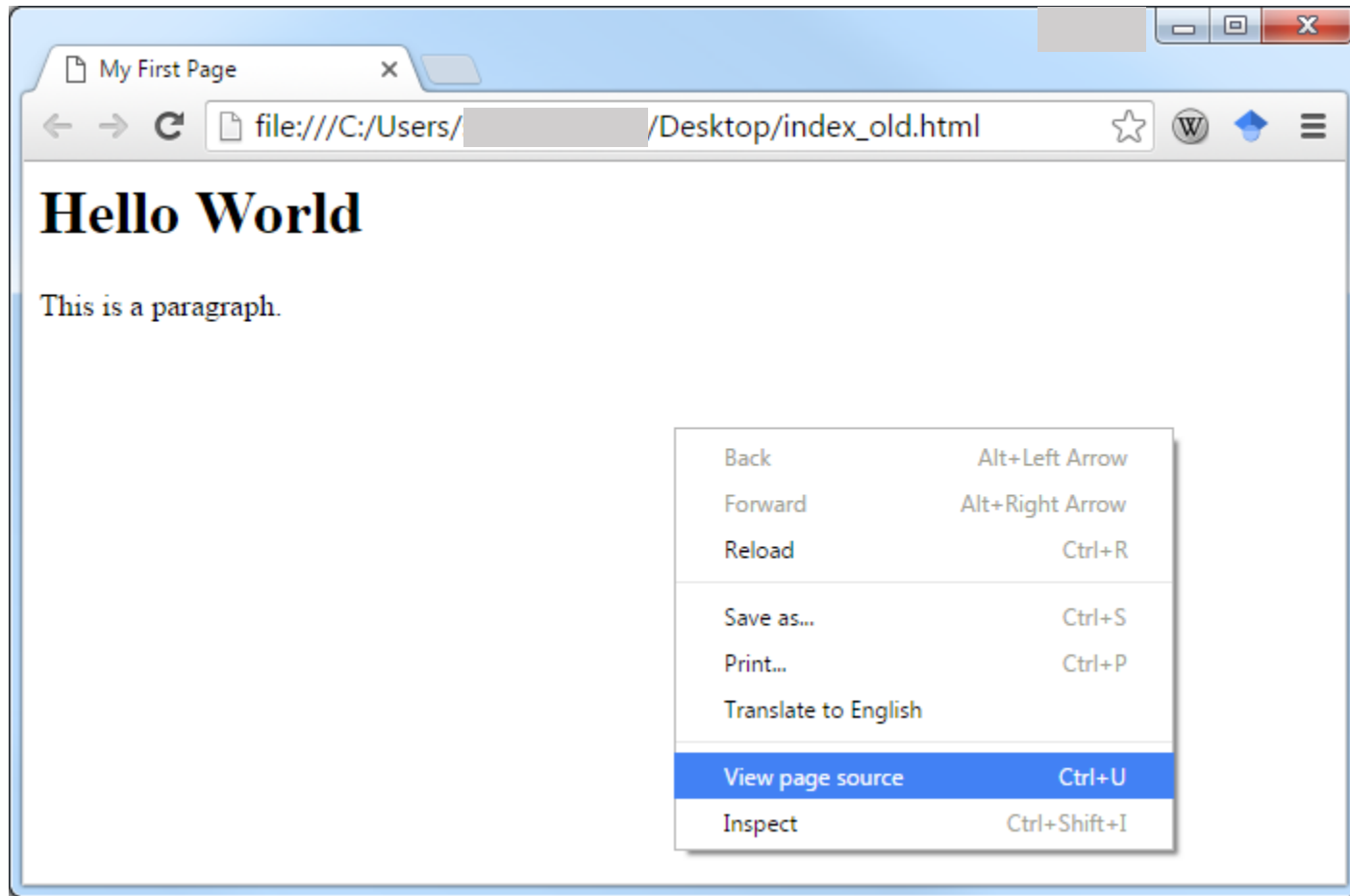
  <body>
    <h1>Hello World</h1>
    <p>This is a paragraph.</p>
  </body>
</html>
```

- 3) Save the file as index.html (change .txt extension to .html)
- 4) Double click on your file to open it in your browser

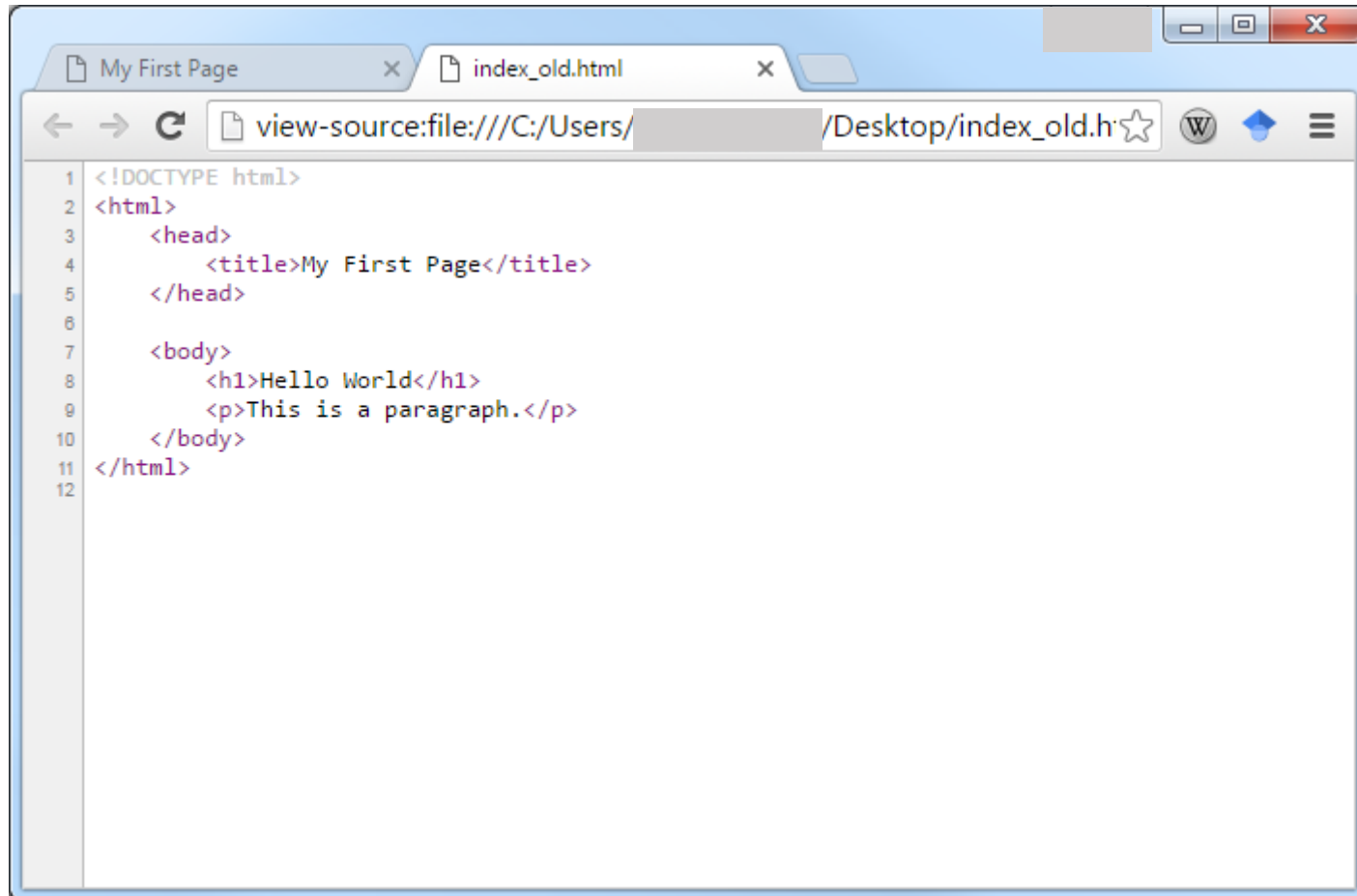
First Simple Example



How to View HTML Source



How to View HTML Source

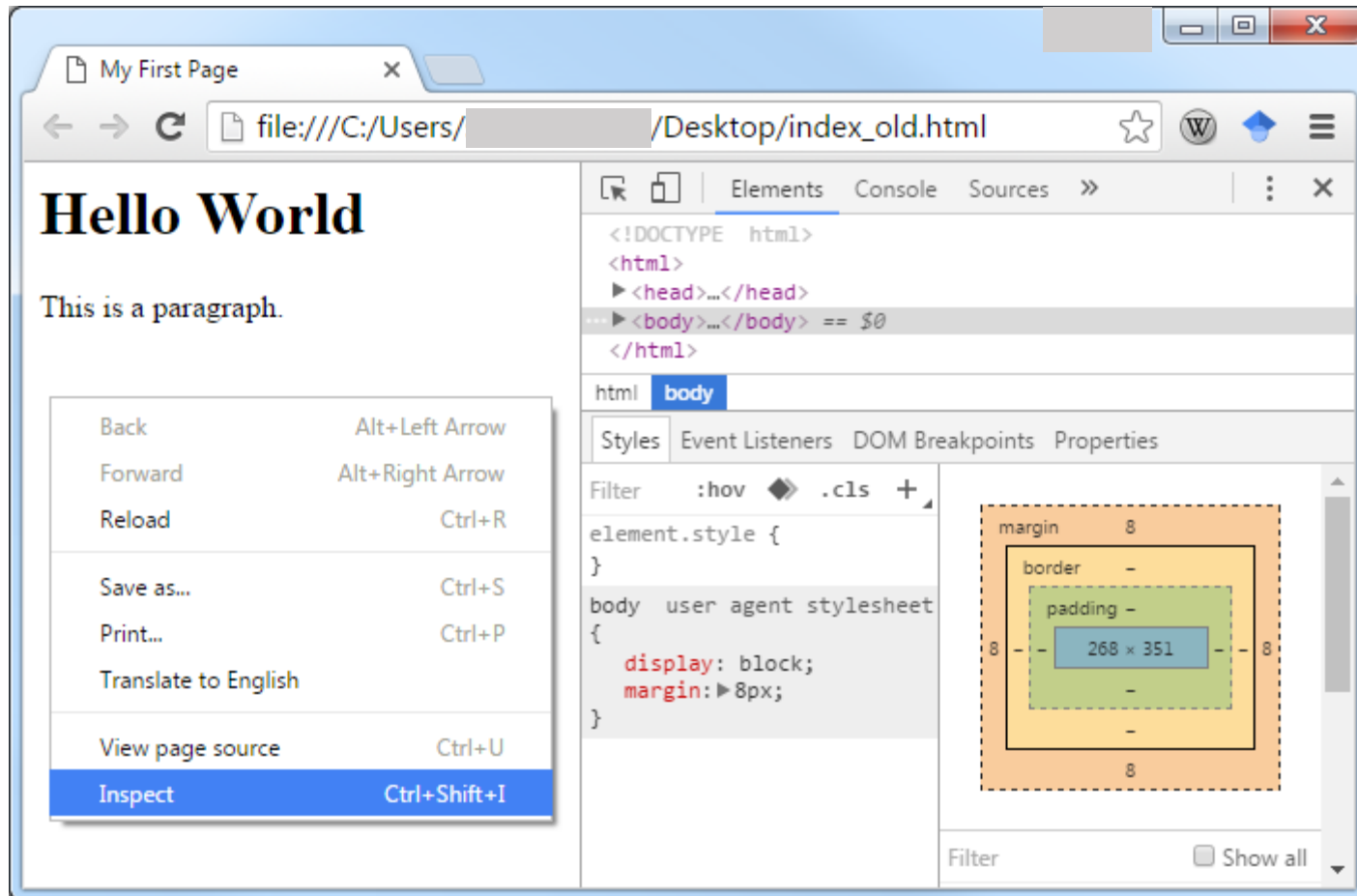


```

1 <!DOCTYPE html>
2 <html>
3   <head>
4     <title>My First Page</title>
5   </head>
6
7   <body>
8     <h1>Hello World</h1>
9     <p>This is a paragraph.</p>
10  </body>
11 </html>
12

```

Chrome Inspect Tool



HTML Links

```
<a href="Link Address">Link Text</a>
```

A horizontal curly brace is positioned below the `href="Link Address"` part of the code, indicating that this part specifies the link destination.

href attribute specifies the link destination

Attributes are used to provide additional information about tags and html elements.

Example (Addressing a web location)

```
<a href="http://www.google.com">Google</a>
```

Example (Addressing a local file)

```
<a href="./my_html.html">My local file/page</a>
```

HTML Links

Lets add a link to our example:

```
<!DOCTYPE html>
<html>
  <head>
    <title>My First Page</title>
  </head>

  <body>
    <h1>Hello World</h1>
    <p>This is a paragraph. </p>
    <a href="http://www.google.com">click here</a>
  </body>
</html>
```

HTML Images

```

```

Adding a picture to our code:

...

```
<body>
```

```
<h1>Hello World</h1>
```

```
<p>This is a paragraph.</p>
```

```
<a href="http://www.google.com">click here</a>
```

```

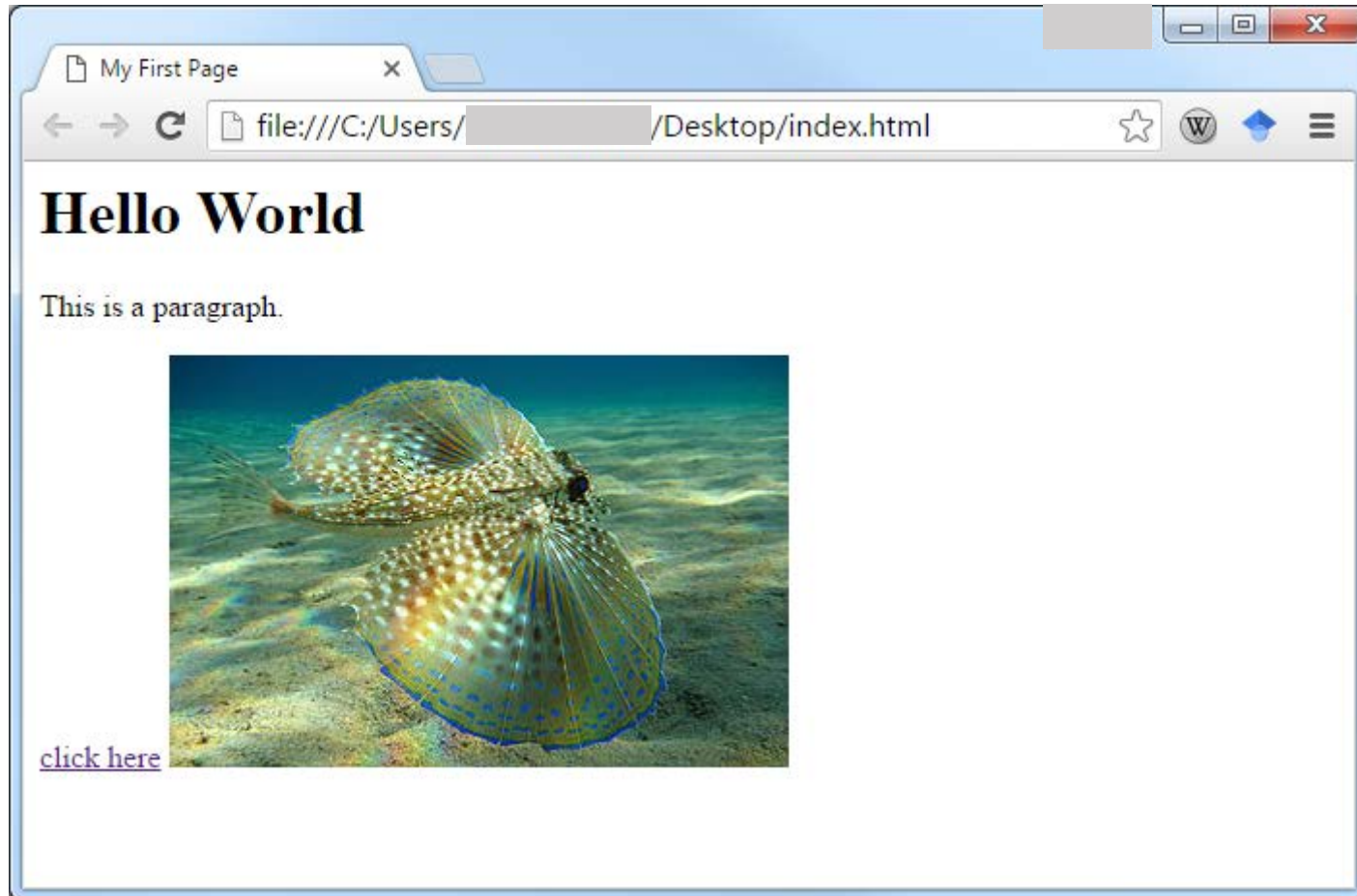
```

```
</body>
```

...

alt displays an alternative string if the image fails to load

Empty HTML Elements



Good HTML Practice 1

Empty HTML Elements

Empty elements are HTML elements which have no content.

Example:

`<br>` is an empty element that does not have a closing tag (i.e. `</br>`)

HTML 5 does not require empty elements to be closed. But it is a good practice to close elements in the opening

Example:

`<br />`

This makes the document readable by XML

Good HTML Practice 2

HTML Tags

HTML tags are not case sensitive (i.e. `<P>` is the same as `<p>`)

Although HTML 5 does not require lowercase tags, it is recommended to use lowercase tags to make the documents compatible with other HTML formats such as XHTML.

lang Attribute

- Document language can be declared in the `<html>` tag using `lang` attribute.
- Defining language is important for accessibility applications and search engines.

```
<!DOCTYPE html>
<html lang="en-US">
  <head>
    <title>My First Page</title>
  </head>

  <body>
    <h1>Hello World</h1>
    <p>This is a paragraph. </p>
    <a href="http://www.google.com">click here</a>
  </body>
</html>
```

title Attribute

- A title for a tag can be defined using the **title** attribute.
- **title** will be displayed as a tooltip upon hovering over the element.

```
<!DOCTYPE html>
<html lang="en-US">
  <head>
    <title>My First Page</title>
  </head>

  <body>
    <h1>Hello World</h1>
    <p title="My text">Hover over this text. </p>
    <a href="http://www.google.com">click here</a>
  </body>
</html>
```

Good HTML Practice 3

Quoting Attribute Values

HTML 5 standard does not require quotes around attribute values. However, it is recommended to use quotes because:

- Making the document compatible with HTML 4
- To reduce the syntax error due to the spaces

Example:

✗ `<p title=HTML Introduction>`



The title will be displayed incorrectly

✓ `<p title="HTML Introduction">`

HTML Headings

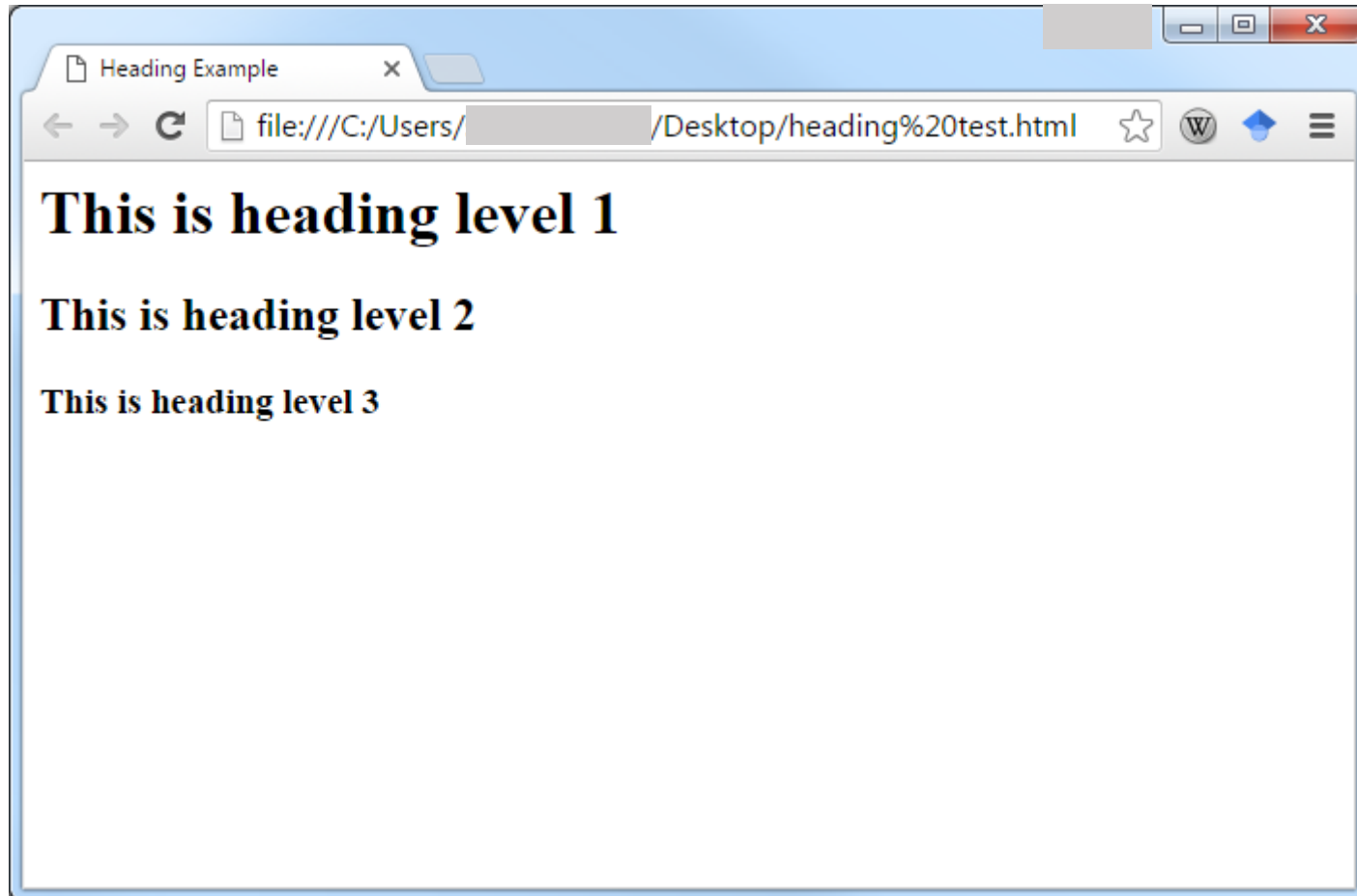
- There are 6 levels of headings in HTML: `<h1>` to `<h6>`
- HTML headings must be used as headings only. That are:
 - To define document structure
 - Inform reader about the materials
- Search engines utilize headings to index the structure and contents of a document. If you want to make your text BIG or Bold, use other attributes or elements.
- `h1` = Main heading > `h2` > `h3` > ... > `h6`

HTML Headings

Exercise:

```
<!DOCTYPE html>
<html lang="en-US">
  <head>
    <title>Heading Example</title>
  </head>
  <body>
    <h1>This is heading level 1</h1>
    <h2>This is heading level 2</h2>
    <h3>This is heading level 3</h3>
  </body>
</html>
```

HTML Headings



Line Breaks and Horizontal Rules

`<br>` element defines a line break

Example:

`<p>` A line break `<br />` breaks this line `</p>`

`<hr>` creates a horizontal line in an HTML document

Example:

`<h1>`This is heading level 1`</h1>`

`<hr />`

`<h2>`This is heading level 2`</h2>`

HTML Style Attribute

style attribute allows the author to define the style of an HTML element

General syntax for **style**:

style="property1:value; ...; property: value"

Some of the properties that can be changed:

Background Color	<code>background-color</code>
Text Color	<code>color</code>
Fonts	<code>font-family</code>
Text Size	<code>font-size</code>
Text Alignment	<code>text-align</code>

HTML Colors

In HTML/CSS color values can be set in different ways:

- Using color names: There are 140 standard color names
- RGB values (Red, Green, Blue)
- Hexadecimal colors: RGB values in hexadecimal format

There are multiple websites that provide Hex codes for colors

Red	rgb(255,0,0)	#FF0000
Orange	rgb(255,165,0)	#FFA500
Yellow	rgb(255,255,0)	#FFFF00
Green	rgb(0,255,0)	#00FF00
Cyan	rgb(0,255,255)	#00FFFF
Blue	rgb(0,0,255)	#0000FF
Magenta	rgb(255,0,255)	#FF00FF
White	rgb(255,255,255)	#FFFFFF
Black	rgb(0,0,0)	#000000

CSS

CSS stands for **C**ascading **S**tyle **S**heets

Styling a HTML document can be done in 3 different ways:

- Inline: by using **style** attribute
- Internal: using **<style>** element in **<head>** section of the HTML document
- External: using a separate CSS file

CSS Position Property

Allowable position property values:

Value	Description
Static (default)	Elements render in order, as they appear in the document flow
absolute	The element is positioned relative to its first positioned (not static) ancestor element.
fixed	The element is positioned relative to the browser window.
relative	The element is positioned relative to its normal position, so "left:20px" adds 20 pixels to the element's LEFT position.
initial	Sets this property to its default value.
inherit	Inherits this property from its parent element.

CSS styling example

```
<!DOCTYPE html>
<html>
<head>
  <link rel="stylesheet"
        href="styles.css">
</head>
<body>

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

</body>
</html>
```

index.html

```
body {
  background-color: lightgrey;
}

h1 {
  color: blue;
}

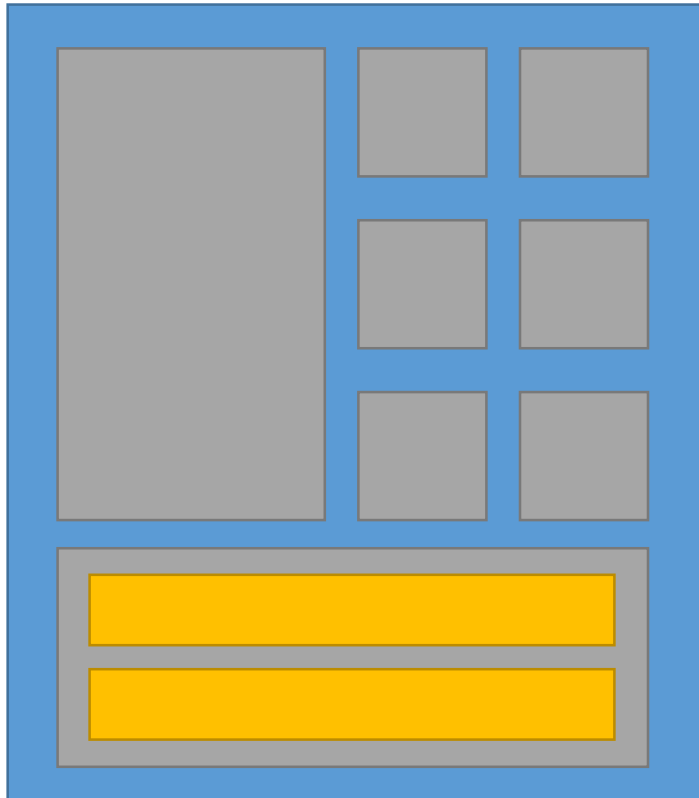
p {
  color: green;
}
```

styles.css

div Element

- A **div** is a division of a document
- Each **div** can be assumed as a box that can contain different elements such as headers, paragraphs and pictures.
- The position of each **div** can be defined with respect to **div** that is contained in (ancestor)

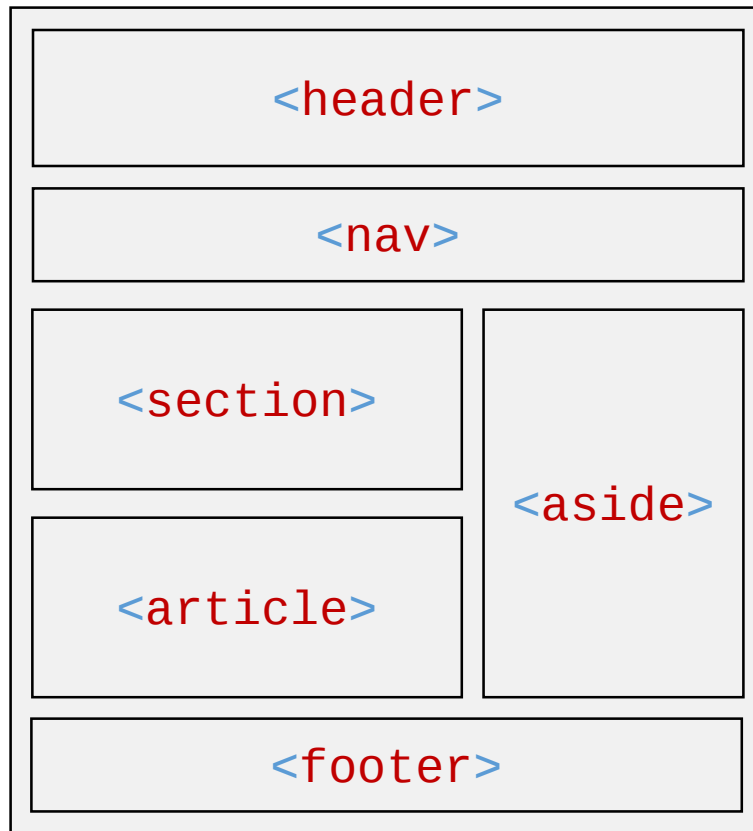
div Element



- Each **div** level is defined with the same color
- One or more **divs** can be contained in another **div**

HTML Layout

HTML 5 offers a set of **semantic** elements that define different parts of a web document



`<header>` defines a header for a document or a section

`<nav>` defines a container for navigation links

`<section>` defines a section in a document

`<article>` defines an independent self-contained article

`<aside>` defines content aside from the content

`<footer>` defines a footer for a document or a section

HTML Responsive Web Design

- The responsive design allows the webpage to adopt itself to any screen size.

```
<!DOCTYPE html>
<html lang="en-us"><head><style>
.wpi {float: left; margin: 5px; padding: 15px; width: 300px; height: 300px;
      border: 1px solid black;}
</style></head>
<body>
```

```
<h1>This is a Responsive Web Page</h1>
```

```
<div class="wpi">
  <h2>Mechanical Engineering</h2>
  <p>Department of Mechanical Engineering is located in HL</p>
</div>
```

```
<div class="wpi">
  <h2>Electrical Engineering</h2>
  <p>Department of Electrical Engineering is located in AK</p>
</div>
</body></html>
```

HTML ID Attribute

- IDs are used to identify each HTML element or tag
- These identifications can be used to reference the corresponding tags
- CSS, JavaScript, PHP or other programming languages can utilize the IDs to modify or change tag or element contents

Syntax:

```
<tag id="TagID">
```

HTML ID Attribute Example

```
<!DOCTYPE html>
<html>
  <body>
    <h1 id="school">My School</h1>
    <h1 id="city">This City</h2>
    <button onclick="displayResult()">Change Text</button>
    <a href="#city">Jump to city</a>
    <script>
      function displayResult(){
        document.getElementById("school").innerHTML = "Lecture";
      }
    </script>
  </body>
</html>
```

HTML Classes

- Classes are used to define similar styles for a category of elements
- Unlike IDs, classes are not unique and many similar elements can be part of the same class.
- Classes can be defined in CSS code

Syntax:

```
Element.ClassName {property1:value; ...; property: value}
```

HTML Class Example

```
<!DOCTYPE html>
<html>
<head>
  <style>
    div.school{
      background-color:#AC2B37;
      color: white;
      margin: 25px;
      padding: 15px;
    }
  </style>
</head>
```

```
<body>
  <div class="school">
    <h2>Mechanical Engineering</h2>
    <p>Information about Mechanical
      Engineering</p>
  </div>
  <div class="school">
    <h2>Electrical Engineering</h2>
    <p>Information about Electrical
      Engineering</p>
  </div>
</body>
</html>
```

Continue →

Good HTML Practice 4

Style sheets

Always try to separate element styles from HTML code. You can make a separate style sheet file and import it into HTML documents

Syntax:

```
<head>  
<link rel="stylesheet" type="text/css" href="mystyle.css">  
</head>
```

In this example, [mystyle.css](#) can have all the style definitions of the html document

Note: A HTML document can have more than one style sheet.

HTML Tables

```
<table id ="tb1" border="1" style="width:100%">
  <caption>Teaching</caption>
  <tr>
    <th>Class Name</th>
    <th>Number of Students</th>
  </tr>
  <tr>
    <td style="text-align:center">Matlab</td>
    <td>53</td>
  </tr>
  <tr>
    <td>Python</td>
    <td style="text-align:center">5</td>
  </tr>
</table>
```

HTML Forms

```
<form action="action_page.php" method="post" target="_blank" accept-
charset="UTF-8" enctype="application/x-www-form-
urlencoded" autocomplete="off" novalidate>
```

```

form elements

```

```

</form>

```

The form input elements can be text, radio buttons, checkboxes, submit buttons. etc

```
<form>
```

```
First name:<br />
```

```
<input type="text" name="firstname"> <br />
```

```
Last name:<br />
```

```
<input type="text" name="lastname"> <br />
```

```
<input type="radio" name="gender" value="male" checked>Male<br />
```

```
<input type="radio" name="gender" value="female">Female<br />
```

```
<input type="radio" name="gender" value="other">Other<br />
```

```
</form>
```