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Hyper Text Markup Language (HTML) - continues

UFCFES-30-1

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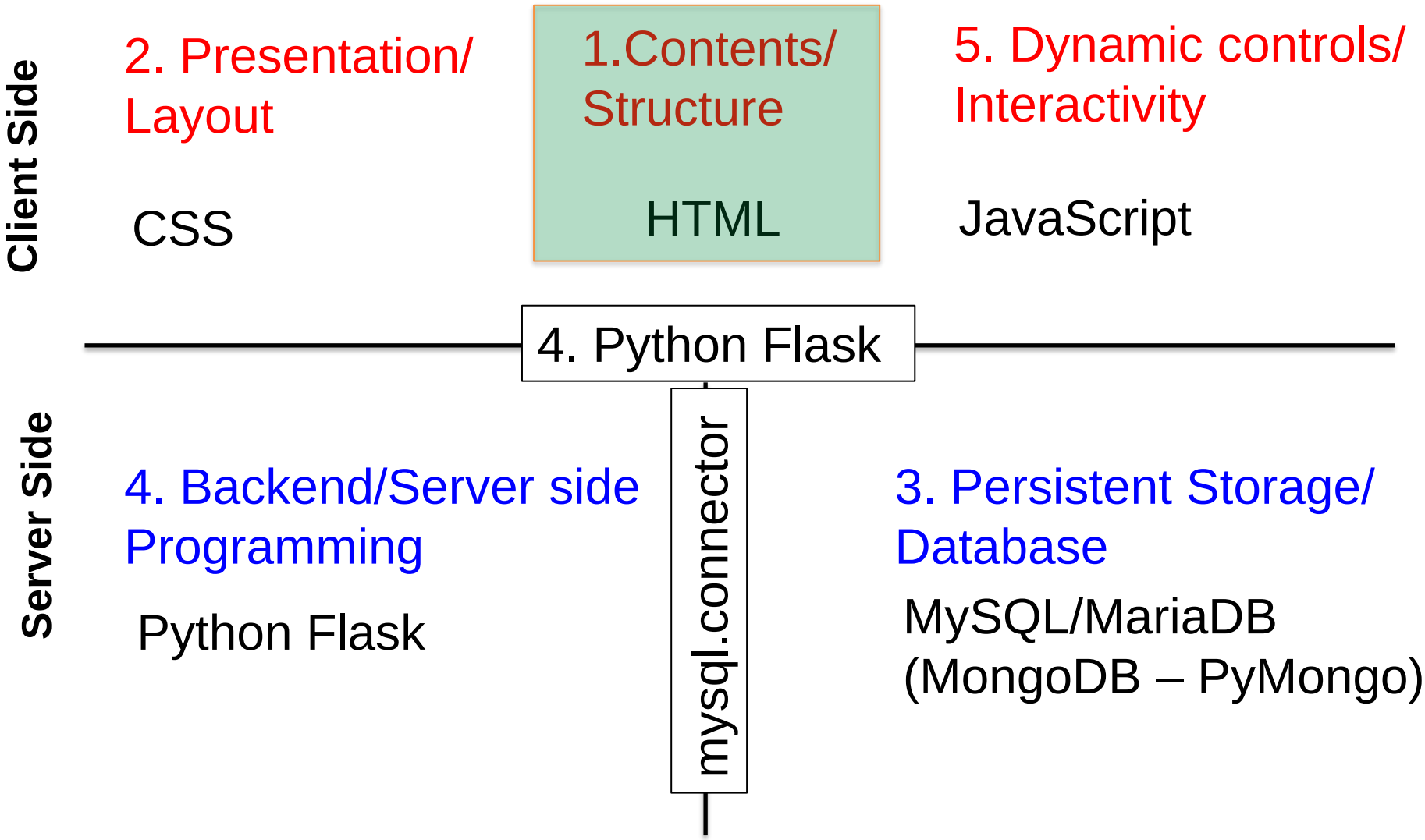
What are we covering in this lecture?

Continuing from last week…

HTML Elements with Examples

Dealing with diversity

Overall Learning Map



HTML Page Structure

```
<html>

  <head>

    <title>Page title</title>

  </head>

  <body>

    <h1>This is a heading</h1>

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

    <p>This is another paragraph.</p>

  </body>

</html>
```

Source: http://www.w3schools.com/html/html_intro.asp

Tags with Attributes

- Attributes provide extra information about elements
  - **Key-value pair** and always in the opening tag
- Tags may have none, one or more attributes
- They appear in any order & separated by spaces or newlines
- **Tip:** Use quotes when attribute values contain spaces
  - <hr width="50%">
  - <h2 align="right">
  - <p align="left" width="50%">
  - <form method='GET' action='server.py'>

- Self Study about Attributes: http://www.w3schools.com/html/html_attributes.asp

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More and more HTML

- Entities
- Links and URLs
- Tables
- Forms
- Images
- A tag rag bag
- Lists
- HTML 5 – new tags and APIs

Entities

- Special characters are called **entities**
- Reserved characters or characters not shown on keyboard can be replaced with entities
- Example: When using '<' or '>' signs, web browser may mix it with HTML tags
- These can be used as text or numerical names
  - we will generally use the text name
  - they all start with "**&**" and end with "**;**"
- Here are some examples:
  - £ Pound sign (£)
  - < '<' sign
  -   A "hard" space

- See more http://www.w3schools.com/html/html_entities.asp

Links and URLs

- The power of HTML is Hypertext
  - A document is linked to another document
  - Or another section in the same document
- Split big documents - use hyperlinks
- Links are made with the Anchor tag <a>

Link Text
Zaheer's Page

Tables

- Tables are an organised collection of rows and columns of cells
- Cells contain data or headings
- Tables should be used to display tabular data – data that must be shown in regular rows and columns
- It is best to use tables with div tags as this allows better formatting – something from CSS
- Although common in the past, you should **not** use tables to format documents – use div instead!

World X1 vs Champs X1

Player	Score
Adam Gilchrist	150
Kevin Pietersen	103

Table Tags

- The basic tags for tables are:
  - <table> <caption> <th> <td> <tr>
  - http://www.w3schools.com/html/html_tables.asp
- The <table> tag starts a table
  - may have a <caption> (description)
- A new row is started with <tr>
- Or header rows with <th> - often bolder text
- A cell value is given by <td>
-
```
<table>
    <tr>
        <td> .. </td>
        <td> .. </td>
    </tr>
    <tr>
        <td> .. </td>
        <td> ..</td>
    </tr>
</table>
```

Table example

```
<!Doctype html>
<html>
<body>
<table border="3" style="width:100%">
    <caption> World X1 vs Champs X1 </caption>
    <tr> <th>Player </th> <th> Score </th></tr>
    <tr>
        <td>Adam Gilchrist</td>
        <td>150</td>
    </tr>
    <tr>
        <td>Kevin Pietersen</td>
        <td>103</td>
    </tr>
</table>
</body>
</html>
```

World X1 vs Champs X1

Player	Score
Adam Gilchrist	150
Kevin Pietersen	103

Images

- All browsers will display
  - Graphics Interchange Format (GIF) – good, lossless compression
  - Joint Photographic Experts Group (JPEG) images – data loss in compression
  - Other supported types e.g. PNG (portable network graphics)
  - Other types may need a plug-in
- Images are added by using the <img> tag:
  - <img src="MyPicture.gif">
- Attributes
  - src (required) e.g. src="photo.jpeg"
  - align top, middle, bottom, left or right
  - title tool tip text e.g. title="Three fish"
  - height width hspace vspace border
  - alt text to display in non-graphical browser

- Images may be used as hyperlinks
  - <img src="apple.gif">

Images

```
<!DOCTYPE html>
<html>
<body>
    <p>Insert an image from another folder:</p>
    <img src="/images/stickman.gif" alt="Stickman"
        width="24" height="39">

    <p>Insert an image from a web site:</p>
    <img src="/images/lamp.gif" alt="Lamp"
    width="15" height="15">

</body>
</html>
```

Insert an image from another folder:

Insert an image from a web site:

Hexadecimal colour codes

- Red, Green, Blue
- <tr align="left" bgcolor="#98FB98">
- <th bgcolor="#BC8F8F">Mon</th>
- What are these weird #..... things?
- These are hexadecimal colour codes
- Hexadecimal (hex) is a base 16 numbering system – digits in hex run from 0 to 15. For convenience, 10 – 15 are represented as letters A – F
- So 29 in decimal would be 16+13 = 1D in hex and 255 decimal would be FF in hex
- In the hex colour codes, the pairs of hex digits represent the amount of red, green and blue in the overall colour
- So #FF00FF is lots of red, no green, lots of blue = magenta
- And #808080 is some red, some green, some blue = grey
- In HTML5 you can also specify color by name (140 standard color names) e.g. color:Tomato

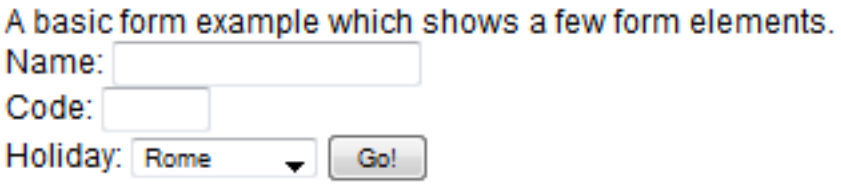
Forms

- HTML Forms are used to input different kinds of user data, e.g., contactus.html
- HTML forms are used to pass data to a server which processes that data and may return results back to client
- There are text fields, checkboxes, radio-buttons, submit buttons, lists and labels etc
- The <form> tag is used to create an HTML form:

- ```
  <form>
      input data
  </form>
  ```

- READ:
- http://www.w3schools.com/html/html_forms.asp
  ```

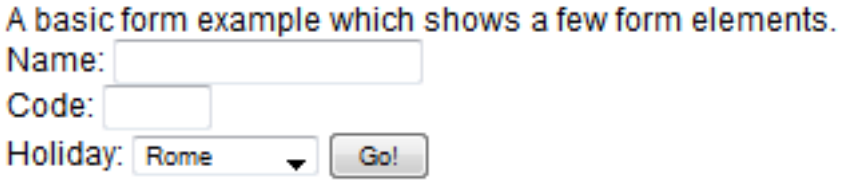
Form fields - submit



- <input type="submit"> defines a submit button.
- A submit button is used to send form data to a server. The data is sent to the file specified in the form's action attribute.

```
<form action=”/dumpsVar.py‟ method="get">
        <input type="submit" value="Go!">
</form>
```

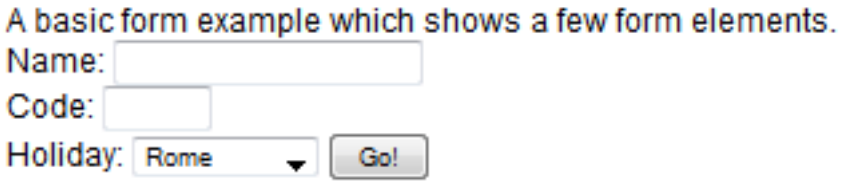
Form fields - text fields



- <input type="text"> defines a one-line input field that a user can enter text
- into:
  - <form action=”/dumpsVar.py">
    Name: <input type="text" name="uname" size="20">
    ....
    </form>

- The form itself is not visible. default width of a text field is 20 characters.
- The uname is the variable name transmitted

Form fields - password



- **Text Fields**
- <input type="password"> defines a one-line input field that a
- user can enter text into:
- <form action="/dumpsVar.py">
  Code: <input type="password", name="code" size=5>
  ....
  </form>

Form fields: Radio and Checkboxes

- **Select options:**
- **radio buttons select one only**
- <form>
  <input type="radio" name="prog" value="comp">Computing
  <input type="radio" name="prog" value="csi">CSI
  </form>

- **Checkboxes select more than one**
- <form>
  <input type="checkbox" name="comp" value="PC">I have a PC
  <input type="checkbox" name="comp" value="IPhone">I have an iPhone

  <input type="checkbox" name="comp" value="tablet">I have a tablet
  </form>

Form fields: Select and Options

- **Drop Down List:**
- **Give the selection a variable name e.g., cars**
- **Give all the options e.g., volvo, toyota, ford etc.**

- ```
<form>
    <select name="cars" size=3 multiple>
        <option value="volvo">Volvo</option>
        <option value="toyota">Toyota</option>
        <option value="ford">Ford</option>
        <option value="mercedes">Ford</option>
        <option value="suzuki">Ford</option>
        <option value="audi">Audi</option>

    </select>
</form>
```
```

Form - Input Element – other types

- <form>
  In Class Test Marks (between 1 and 5):
  <input type="number" name="quantity" min="1" max="5">
  </form>

In Class Test Marks (between 1 and 5): 1

- <form action="serverscript.py">
  Student Marks:
  <input type="number" name="marks" min="0" max="100" step="10" value="30">
  <input type="submit" value="Send to Server">
  </form>

Student Marks: 30 Send to Server

- <form>
  Enter E-mail:
  <input type="email" name="email">
  </form>

Automatically validates email syntax

Form - Input Elements

- Go through all new input elements [Very Important] – including text, password, submit, radio, checkbox, button, HTML5 specific: number, date, color, range, month, week, time, datetime, email, search, tel, url, etc.

- http://www.w3schools.com/html/html_form_input_types.asp

Form - Input Attributes - Examples

- <input type="text" name="firstname" value=”Zaheer">
  <input type="text" name="firstname" value=”Zaheer" readonly>
  <input type="text" name="firstname" value=”Zaheer" disabled>
  <input type="text" name="firstname" value=”Zaheer" size="20">
  <input type="text" name="firstname" value=”Zaheer" maxlength="20">
  <input type="text" name="firstname" value=”Zaheer" autofocus>

- <form action="server1.py">
  <input …… >
  <input type="submit" formaction="server2.py" value="Site Admins">
  <input type="submit" value="Customers">
  </form>

- Very Important: Check all other attributes and examples at:
  http://www.w3schools.com/html/html_form_attributes.asp

Form - Input Attributes - Examples

- **Patterns**

```
<form>
        <label for="firstname">First Name: </label>

        <input type="text" name="firstname" id="firstname" pattern="[A-Za-z ]{1,32}"
        title="Enter First name"> <br><br>
        <input type="submit">
</form>
```

- Supported input types: input types: text, date, search, url, tel, email, and password

Read: https://www.w3schools.com/tags/att_input_pattern.asp

Read Regular expressions:
https://www.w3schools.com/js/js_regexp.asp

Coding Conventions

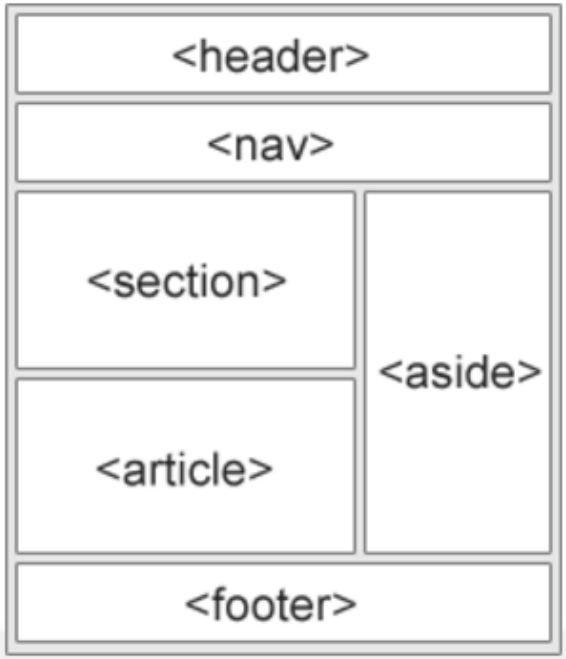
- Self Study - http://www.w3schools.com/html/html5_syntax.asp

- lowercase element names e.g. <section>,
- close all elements e.g. </section>
- lowercase attribute names e.g. class, name
- quote attribute values e.g. name="name"
- Always use alt, width and height attributes with img tag – for accessibility
- Code indentation to improve readability
- You may omit html, head and body tags but html is useful to define specific attributes like lang
- title element is required in HTML 5
- Language and character encoding should be defined earlier for proper interpretation and search engines indexing e.g. meta tag
- Short comments - <!-- comments -->
- User lowercase filenames
- No difference between .htm and .html
- Default files: index.html, index.htm, default.html, default.htm

New Semantic Elements in HTML5

- Very Important: Go through - <article>, <aside>, <details>, <figcaption>, <figure>, <footer>, <header>, <main>, <mark>, <nav>, <section>, <summary>, <time>
- READ: http://www.w3schools.com/html/html5_semantic_elements.asp
- Example:

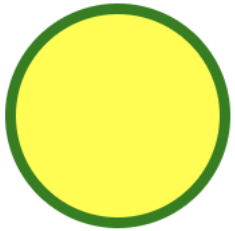
```
<header>
University of the West of England, Bristol
</header>
<nav> FET   FBL    HS   </nav>
<section>
        <h1>UWE</h1>
        <p>University of the West of England.....</p>
</section>
<footer> copyrights </footer>
```



Canvas and SVG and MathML

- HTML Canvas – 2D graphics using JavaScript
  http://www.w3schools.com/html/html5_canvas.asp
- HTML SVG – 2D graphics in XML
  http://www.w3schools.com/html/html5_canvas.asp
- MathML – for math symbols
  http://www.tutorialspoint.com/html5/html5_mathml.htm

- ```
  <!DOCTYPE html>
  <html>
  <body>
      <svg width="100" height="100">
          <circle cx="50" cy="50" r="40" stroke="green" stroke-width="4" fill="yellow" />
      </svg>
  </body>
  </html>
  ```


  ```

Video and Audio

- With HTML5, there is no need for plug-in to run a video in Web browser
- Video: http://www.w3schools.com/html/html5_video.asp
- Audio http://www.w3schools.com/html/html5_audio.asp
-
- Examples:

```
<audio controls>
      <source src="mysong.mp3" type="audio/mpeg">
Your browser does not support the audio element.
</audio>

<video width="320" height="240" controls>
  <source src="testmovie.mp4" type="video/mp4">
Your browser does not support the video tag.
</video>
```

For Advanced Topics

- Geolocation - http://www.w3schools.com/html/html5_geolocation.asp
- Drag and Drop - http://www.w3schools.com/html/html5_draganddrop.asp
- Local Storage - http://www.w3schools.com/html/html5_webstorage.asp
- Web workers – http://www.w3schools.com/html/html5_webworkers.asp
- Server-Sent Event - https://www.w3schools.com/html/html5_serversentevents.asp

Get the best from your web browser

- BEWARE - Documents appear different in different browsers - especially colours and backgrounds

- Remember simple and easy to navigate website is often the best option so keep web pages clean and simple

- Things for you to find out - how do you …
  - view the source of a web page in a web browser?
  - use web browser developer tools?
  - open a link in a new window?
  - set a new home page?
  - test your web page on mobile phone screen?
  - check your history in a browser?
  - find a particular word on the page you are viewing?

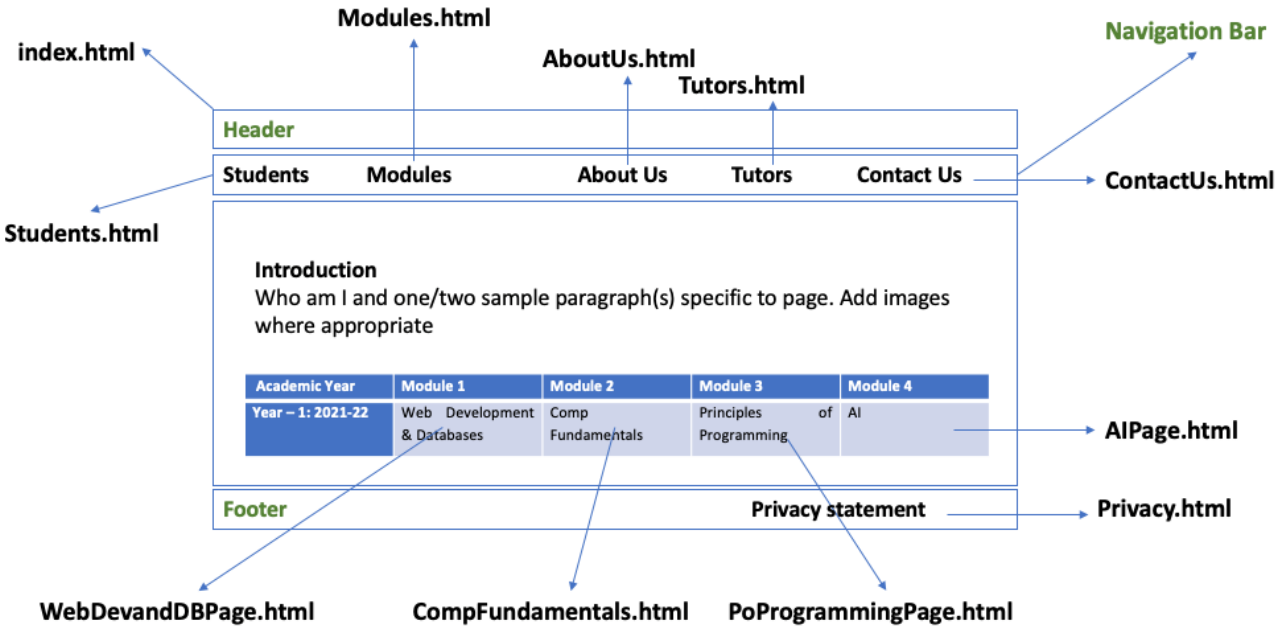
HTML 4 → HTML 5

- Though new pages should be written in HTML5, you need to **know about HTML 4 as most existing pages are written using this** and a large part of developer effort goes into maintaining existing pages/sites
- **Self Study:** Many features of HTML 4 are no longer supported
  - Migration from HTML4 to HTML5 - http://www.w3schools.com/html/html5_migration.asp

Typical HTML4	Typical HTML5
	<header>
	<nav>
	<section>
	<article>
	<footer>

Web project

- Learn tags/attributes and their use
- **Tip:** Start with designing webpage layout – **wireframes** i.e. 2D illustration of a page's interface focusing on space allocation, content prioritization, intended behaviour etc.
- Read: https://www.usability.gov/how-to-and-tools/methods/wireframing.html



Lots to learn …

- Lots to learn from online resources and in practical

- Complete practical exercises as this will help you to learn HTML and use it when we'll start generating dynamic webpages through Python Flask

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Summary

- HTML background
- HTML Standards
- HTML Page structure
- HTML elements
- HTML Form
- HTML5 new elements
- Next Topic will be CSS