HUMAN COMPUTER INTERFACE

Human Computer Interfacing

- Human–computer interaction/interfacing (HCI) is the study, planning and design of the interaction between people (users) and computers.
- It is often regarded as the intersection of computer science, behavioral sciences, design and several other fields of study.

Origin of the Concept

- Sometimes called as Man-Machine Interaction or Interfacing, concept of Human-Computer Interaction/Interfacing (HCI) was automatically represented with the emerging of computer, or more generally machine, itself.
- The reason, in fact, is clear: most sophisticated machines are worthless unless they can be used properly by men
  - This basic argument simply presents the main terms that should be considered in the design of HCI:
    - Functionality
    - Usability

- *Functionality*
  - of a system is defined by the set of actions or services that it provides to its users.
  - However, the value of functionality is visible only when it becomes possible to be efficiently utilized by the user.
- *Usability*
  - of a system with a certain functionality is the range and degree by which the system can be used efficiently and adequately to accomplish certain goals for certain users.
- The actual effectiveness of a system is achieved when there is a proper balance between the functionality and usability of a system.

Usability

- Examples:
- Website 1
- Website 2
- Website 3

- During this course we will see how useful interfaces can be developed starting off with web based interfaces.
- Today's lecture will have a brief introduction to HTML and CSS, in next lecture we would shift to ASP.net

HTML

- **What is HTML?**
  - HTML is a language for describing web pages.
  - HTML stands for **H**yper **T**ext **M**arkup **L**anguage
  - HTML uses **tags** to describe web pages

- **HTML Documents = Web Pages**
  - HTML documents **describe web pages**
  - HTML documents **contain HTML tags** and plain text
  - HTML documents are also **called web pages**

HTML Tags

- HTML tags are keywords surrounded by **angle brackets** like <html>
- HTML tags normally **come in pairs** like and
- The first tag in a pair is the **start/opening tag,** the second tag is the **end/closing tag**
- Example

```
<html>
   <body>
      <h1>My First Heading</h1>
      <p>My first paragraph.</p>

   </body>
</html>
```

- **Example Explained**
  - The text between <html> and </html> describes the web page
  - The text between <body> and </body> is the visible page content
  - The text between <h1> and </h1> is displayed as a heading
  - The text between and is displayed as a paragraph

HTML Elements

- An HTML element is everything from the start tag to the end tag.
  - Some HTML elements have **empty content**
  - Empty elements are **closed in the start tag**
  - Most HTML elements can have **attributes**

- **Some of the elements:**
- **HTML Headings**
  - HTML headings are defined with the <h1> to <h6> tags.
- **Example**

```
<h1>This is a heading</h1>
<h2>This is a heading</h2>
<h3>This is a heading</h3>
```

HTML Elements

- **HTML Paragraphs**
  - HTML paragraphs are defined with the <p> tag.
- **Example**
  -
```
<p>This is a paragraph.</p>
<p>This is another paragraph.</p>
```

- **HTML Images**
  - HTML images are defined with the <img> tag.
- **Example**
  -

- **HTML Comments**
  - Comments can be inserted into the HTML code to make it more readable and understandable.
- **Example**
  - <!-- This is a comment -->

HTML Elements

- **HTML Lines**
  - The <hr /> tag creates a horizontal line in an HTML page. The hr element can be used to separate content:
- **Example**
  - This is a paragraph
    <hr />
    This is a paragraph
    <hr />
    This is a paragraph
- **HTML Links**
  - HTML links are defined with the <a> tag.
- **Example**
  - This is a link

HTML Elements

- **HTML Links - The name Attribute**
  - The name attribute specifies the name of an anchor. It is used to create a bookmark inside an HTML document.
- **Example**
  - A named anchor inside an HTML document:
    Useful Tips Section
  - Create a link to the "Useful Tips Section" inside the same document:
    Visit the Useful Tips Section
  - Or, create a link to the "Useful Tips Section" from another page:

    Visit the Useful Tips Section

HTML Elements

- **Tables:**
- Tables are defined with the <table> tag.
  - A table is divided into rows (with the <tr> tag), and each row is divided into data cells (with the <td> tag).
  - td stands for "table data," and holds the content of a data cell.
  - A <td> tag can contain text, links, images, lists, forms, other tables, etc.

- **Table Example**

```
<table border="1">
   <tr>
      <td>     row 1, cell 1     </td>
      <td>     row 1, cell 2     </td>
   </tr>
   <tr>
      <td>     row 2, cell 1     </td>
      <td>     row 2, cell 2     </td>
   </tr>
</table>
```

HTML Elements

- **HTML Table Headers**
  - Header information in a table are defined with the <th> tag.
  - All major browsers will display the text in the <th> element as bold and centered.

- Example:

```
<table border="1">
   <tr>
      <th>     Header 1     </th>
      <th>     Header 2     </th>
   </tr>
   <tr>
      <td>     row 1, cell 1     </td>
      <td>     row 1, cell 2     </td>
   </tr>
</table>
```

HTML Text Formatting Tags

Tag	Description
<b>	Defines bold text
<big>	Defines big text
	Defines emphasized text
<i>	Defines italic text
<small>	Defines small text
	Defines strong text
<sub>	Defines subscripted text
<sup>	Defines superscripted text

HTML Attributes

- HTML elements can have **attributes.** Attributes provide **additional information** about an element
- Attributes are always specified in **the start tag.**
- Attributes come in name/value pairs like: **name="value"**
- **Attribute Example**
  - HTML links are defined with the <a> tag. The link address is specified in the href attribute:
  - This is a link

HTML Attributes Reference

- Below is a list of some attributes that are standard for most HTML elements:

Attribute	Value	Description
Class	*classname*	Specifies a classname for an Element
id	*id*	Specifies a unique id for an element
Style	*style_definition*	Specifies an inline style for an element
Title	*tooltip_text*	Specifies extra information about an element (displayed as a tool tip)

- .

HTML Style

- **Background Color**
  - The background-color property defines the background color for an element:

- **Example**

```
<html>
    <body style="background-color:yellow">

    <h2 style="background-color:red">This is a heading</h2>
    <p style="background-color:green">This is a paragraph.</p>

    </body>
</html>
```

HTML Style

- **Font, Color and Size**
  - The font-family, color, and font-size properties defines the font, color, and size of the text in an element:

- **Example**
  - <html>
    <body>

    <h1 style="font-family:verdana">A heading</h1>

    A Paragraph.

    </body>
    </html>

HTML Forms

- HTML forms are used to pass data to a server.
  - A form can contain input elements like text fields, checkboxes, radio-buttons, submit buttons and more.
  - A form can also contain select lists, textarea, fieldset, legend, and label elements.

- The <form> tag is used to create an HTML form:

  <form>
  .
  input elements
  .
  </form>

HTML DIV

- The tag defines a division or a section in an HTML document.
- It is often used to group elements to format them with styles.
- a div can contain any/every other type of html element within its beginning and ending tag.
- Example:

```
<div style="color:#00FF00">
        <h3>This is a header</h3>
        <p>This is a paragraph.</p>
</div>
```

- Cascading Style Sheets

Cascading Style Sheets (CSS)

- Cascading style sheets are **external style sheets** that determine how HTML elements will be displayed.

CSS

- HTML was never intended to contain tags for formatting a document.
- HTML was intended to define the content of a document, like:
  - <h1>This is a heading</h1>
  - This is a paragraph.
- Development of large web sites, where fonts and color information were added to every single page, became a long and expensive process.
- Styles are normally saved in external .css files.
- External style sheets enable us to change the appearance and layout of all the pages in a Web site by editing one single file.

CSS Syntax

- A CSS rule has two main parts:
  - a selector
  - one or more declarations
- Selector:
  - The selector is normally the HTML element you want to style.
- Declaration:
  - Each declaration consists of
    - A property
    - a value.
  - The property is the style attribute you want to change. Each property has a value
    - ```
      p
      {
      color:      red;
      text-align: center;
      }
      ```

ID and Class Selectors

- In addition to setting a style for a HTML element, CSS allows us to specify our own selectors called “id” and “class”.
- **The id Selector**
  - The id selector is used to specify a style for a single, unique element.
  - The id selector uses the id attribute of the HTML element, and is defined with a "#".
- **Example**
  - The style rule below will be applied to the element with id="para1":
  - ```
    #para1
    {
      text-align:      center;
      color:           red;
    }
    ```

ID and Class Selectors

- **The class Selector**
  - The class selector is used to specify a style for a group of elements.
  - This allows you to set a particular style for any HTML elements with the same class.
  - The class selector uses the HTML class attribute, and is defined with a "."
- **Example**
  - In the example below, all HTML elements with class="center" will be center-aligned:
  - ```
    .center
    {
       text-align:          center;
    }
    ```

Inserting CSS files

- There are three ways of inserting a style sheet into an HTML document:
  - External style sheet
  - Internal style sheet
  - Inline style
    ```

External Style Sheet

- An external style sheet is ideal when the style is applied to many pages.
- Each page must link to the style sheet using the <link> tag.

- The <link> tag goes inside the head section.
- Example:
  - <head>
    <link rel="stylesheet" type="text/css" href="mystyle.css" />
    </head>

- An example of a style sheet file is shown below:

```
hr
{color:sienna;}
    p
{margin-left:20px;}
    body
{background-image:url("images/back40.gif");}
```

Internal Style Sheet

- An internal style sheet should be used when a single document has a unique style.
- Internal styles are defined in the head section of an HTML page, by using the <style> tag.

- Example:

```
<head>
   <style type="text/css">
                hr
                {color:sienna;}
                p
                {margin-left:20px;}
                body
                {background-image:url("images/back40.gif");}
   </style>
</head>
```

Inline Styles

- An inline style loses many of the advantages of style sheets by mixing content with presentation.

- To use inline styles the style attribute is used in the relevant tag.
- The style attribute can contain any CSS property.

- Example:
- The example shows how to change the color and the left margin of a paragraph:

```
<p style="color:sienna;margin-left:20px">
This is a paragraph.
</p>
```