CMPUT 175 LAB 8

Lab Part 1

Goal: Gain an intuition about how binary search works. (http://en.wikipedia.org/wiki/Binary_search_algorithm)

Lab Part 1

Sub Part1: Create a number guessing game.

In the first part of this lab you are tasked with creating a simple number guessing game. In it the user is given 6 guesses to determine a random whole number ranging 0 to 100. When the user guesses they are then told if they are too high or too low.

Lab Part 1

If they guess correctly they are then told “Hooray you won!” Otherwise if they have depleted their guesses they are told “Ohh no you lost, the correct number is xx”. If at any time they type “exit” the game ends.

Error handling is not important for this exercise

Sample output

Your Guess:50

Too Low.

Your Guess:75

Too High.

Your Guess: 62

Too Low.

Your Guess:68

Hooray you won!

Lab Part 1

Sub Part 2: Next implement a binary search for a number in the same range(0..100) as above but this time you pick the number. The computer will guess a number you then tell it if the number is too high(-) or too low(+). Typing win if the computer guesses correctly and exit if you wish to stop.

Sample output

User or Computer:Computer

Computer Guess:50

+

Computer Guess:75

-

Computer Guess: 62

+

Computer Guess:68

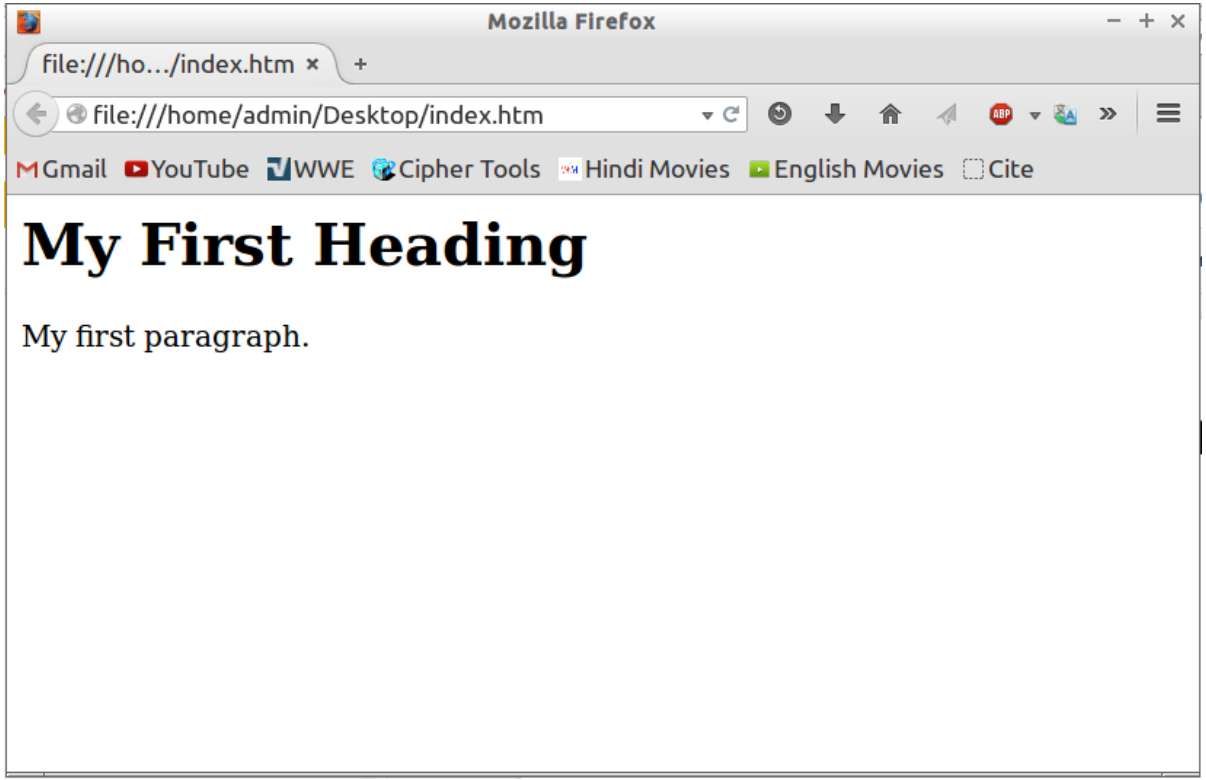
win

Hooray the computer won

HTML Basics

- Markup language for creating web pages
- Consists of a set of HTML tags
- Each tag describes a different aspect of the web page
- Sources: www.w3schools.com
- HTML reference: www.w3schools.com/tags/
- Other references: https://developer.mozilla.org/en-US/docs/Web/HTML

A Simple Web Page



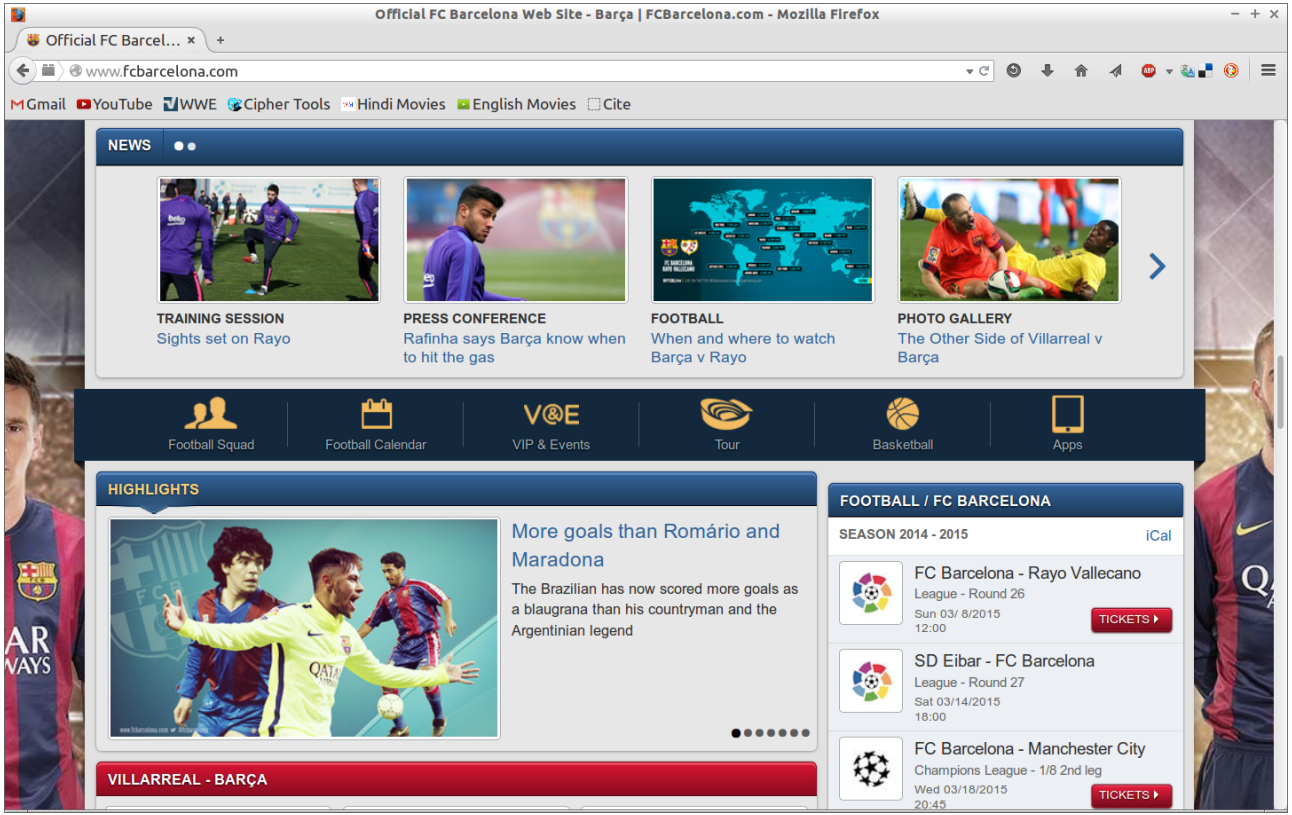
Code of A Simple Web Page

```
<html>
    <body>

      <h1>My First Heading</h1>

      <p>My first paragraph.</p>

    </body>
</html>
```

Your First Web Page

- Open a text editor like Notepad
- Write or copy the code from the previous slide into a new file
- Save the file on your Desktop as “**index.htm**”
- Double-click the file from your Desktop
- The file should open in your web browser, e.g. Internet Explorer, Google Chrome, Firefox, etc.

This is made with HTML



HTML Basic Tags

Documents `<html><body>`

Headings `<h1><h2><h3><h4><h5><h6>`

Paragraphs `<p>`

Hyperlinks `<a>`

Images `<img>`

Lists `<ul><ol><li>`

Tables `<table><tr><td>`

Divisions `<div>`

HTML Elements

- HTML documents are created using HTML elements
- An element is a start tag, content, and end tag

```
<p>My first paragraph.</p>
```

Start and End Tags

- Start and end tags are similar, e.g.

```
<p>          </p>
<body>       </body>
<html>       </html>
```

- Some HTML tags don’t have end tags, e.g.

```
<br />
<img />
```

Nesting Tags

- A tag can be nested within another
- In your first web page, the `<body>` tag is nested within the `<html>` tag, while the `<p>` and `<h1>` tags are both nested within the `<body>` tag

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

HTML Basic Tags - Documents

- The web page's HTML starts with `<html>` and ends with `</html>`
- In the browser, what is inside the `<body>` and `</body>` tags is shown

HTML Basic Tags - Headings

- There are 6 heading tags
  `<h1><h2><h3><h4><h5><h6>`
- Headings are shown with bold font
- `<h1>` describes the most important heading
- `<h6>` is for the least important heading
- Headings require a closing tag, i.e.
  `<h1>Title</h1>`

HTML Basic Tags - Paragraphs

- Dividing your web page into paragraphs makes it structured and organized
  `<p></p>`
- For going to a new line on a web page, you can also use the `<br />` tag

HTML Basic Tags - Hyperlinks

- Hyperlinks let you click on them and redirect or open another web page or document

  Click Here

- A hyperlink is created with the `<a>` tag and an *attribute*, `href`

```
<a href="http://cs.ualberta.ca">Click Here</a>
```

HTML Basic Tags - Images

- You can show images on a web page by using the `<img>` tag
- The `<img>` tag doesn't have a closing tag
- The location of the image file to use has to be specified by the attribute `src`

```
<img src="mypic.jpg" />
```

- The location of the image file can be relative to where the web page was saved

HTML Basic Tags - Lists (Unordered)

- You can create *bullet-point* lists with the `<ul>` and `<li>` tags
- List starts with `<ul>` and each item with `<li>`

```
<ul>
    <li>Mother Bear</li>
    <li>Father Bear</li>
    <li>Baby Bear</li>
</ul>
```

- Mother Bear
- Father Bear
- Baby Bear

HTML Basic Tags - Lists (Ordered)

- You can create *numbered* lists with the `<ol>` and `<li>` tags
- List starts with `<ol>` and each item with `<li>`

```
<ol>
    <li>Mother Bear</li>
    <li>Father Bear</li>
    <li>Baby Bear</li>
</ol>
```

1. Mother Bear
2. Father Bear
3. Baby Bear

HTML Basic Tags - Tables

- You can create a table on a web page by using the `<table>, <tr>, <td>` tags
- The table starts with the `<table>` tag
- A row starts with the `<tr>` tag
- A column starts with the `<td>` tag

HTML Basic Tags - Table Example

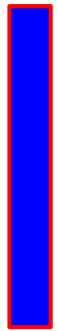
```
<table>
    <tr>
        <td>Name</td>
        <td>Job</td>
    </tr>
    <tr>
        <td>Han Solo</td>
        <td>Pilot</td>
    </tr>
</table>
```

Name	Job
Han Solo	Pilot

HTML Basic Tags - Divisions

- The `<div>` tag can be used as a container or a place holder
- It has a closing tag needed, `</div>`
- Like other tags, `<div>` elements can be styled

```
<div style="width:10px;height:200px;
background:blue;border:1px solid red;">
</div>
```

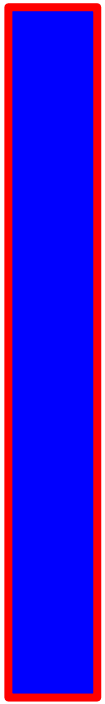


Style and Formatting

- The `style` attribute contains formatting details
- `style` is details use another markup language called Cascading Style Sheets (CSS)
- In CSS, we use properties and set values
- Properties are separated by the semi-colon

Style and Formatting - `<div>`

- `width:10px` - Sets the width to 10 pixels
- `height:200px` - Sets the height to 200 pixels
- `background:blue` - Sets background to blue
- `border:1px solid red` - Sets border to red using a solid line of width 1 pixel
- A pixel is a unit of measurement



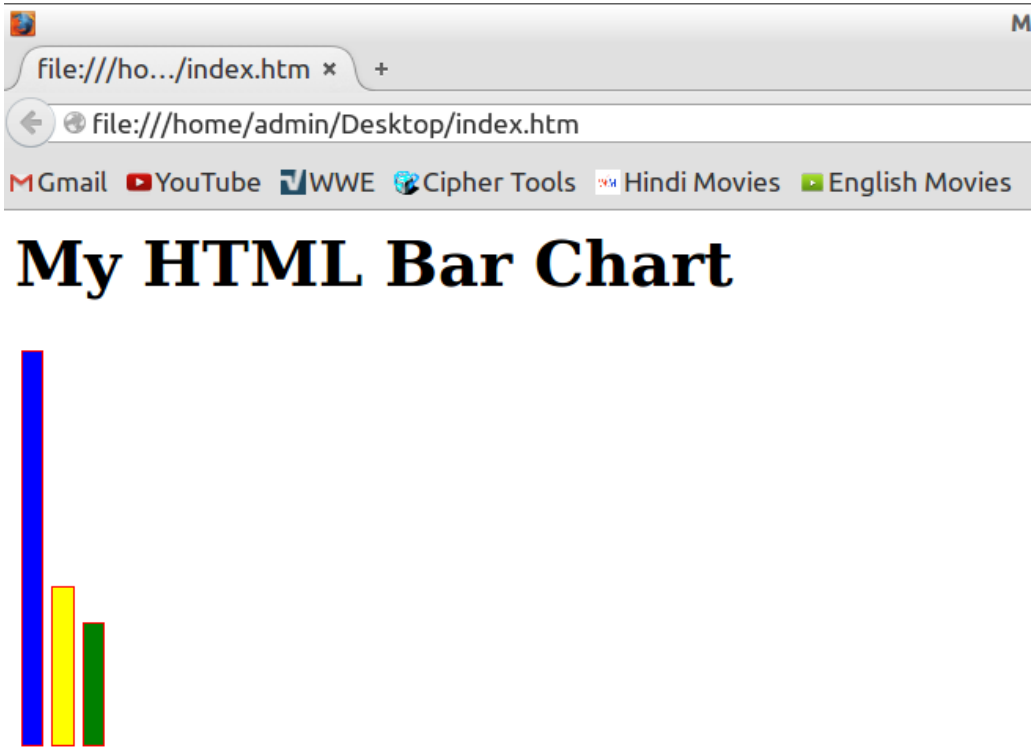
Creating bar chart with `<div>` and `<table>`

- To create a bar chart, we can use a `table`'s columns to hold the bars
- Each bar is drawn using a `<div>` tag
- Each `div` can have a different height to represent the bar heights
- Different colors can be used for each bar if needed

Creating bar chart with and <table>

```
<table>
     <tr>
          <td valign="bottom">
               <div style="width:10px;height:200px;background:blue;
               border:1px solid red;"></div>
          </td>
          <td valign="bottom">
               <div style="width:10px;height:80px;background:yellow;
               border:1px solid red;"></div>
          </td>
          <td valign="bottom">
               <div style="width:10px;height:61px;background:green;
               border:1px solid red;"></div>
          </td>
     </tr>
</table>
```

Creating bar chart with and <table>



Part 2 - build your own page

In this exercise you will read a file containing some student IDs and marks, process them and show the results in a html page.

- Your program reads the data from the file **input.txt**. Each line in this file contains one ID and one mark, separated by a space.

Part 2 - build your own page

- The marks are **integer** numbers between 0 and 100.
- In the html page, you should show the average, minimum, and maximum mark in the class

Part 2 - build your own page

- You also have to show a bar chart containing statistics of the marks.
- X axis shows mark intervals, for example [0-9], [10-19], [20-29] and so on to [90-100].
- Y axis shows the number of students that got a mark in the corresponding interval.

Part 2 - sample output

Welcome to statistics page!

Average is: 55.5375
Minimum is: 3
Maximum is: 98