Javascript – The Browser

INF1802

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Outline

- Module 2 – Javascript and the Browser

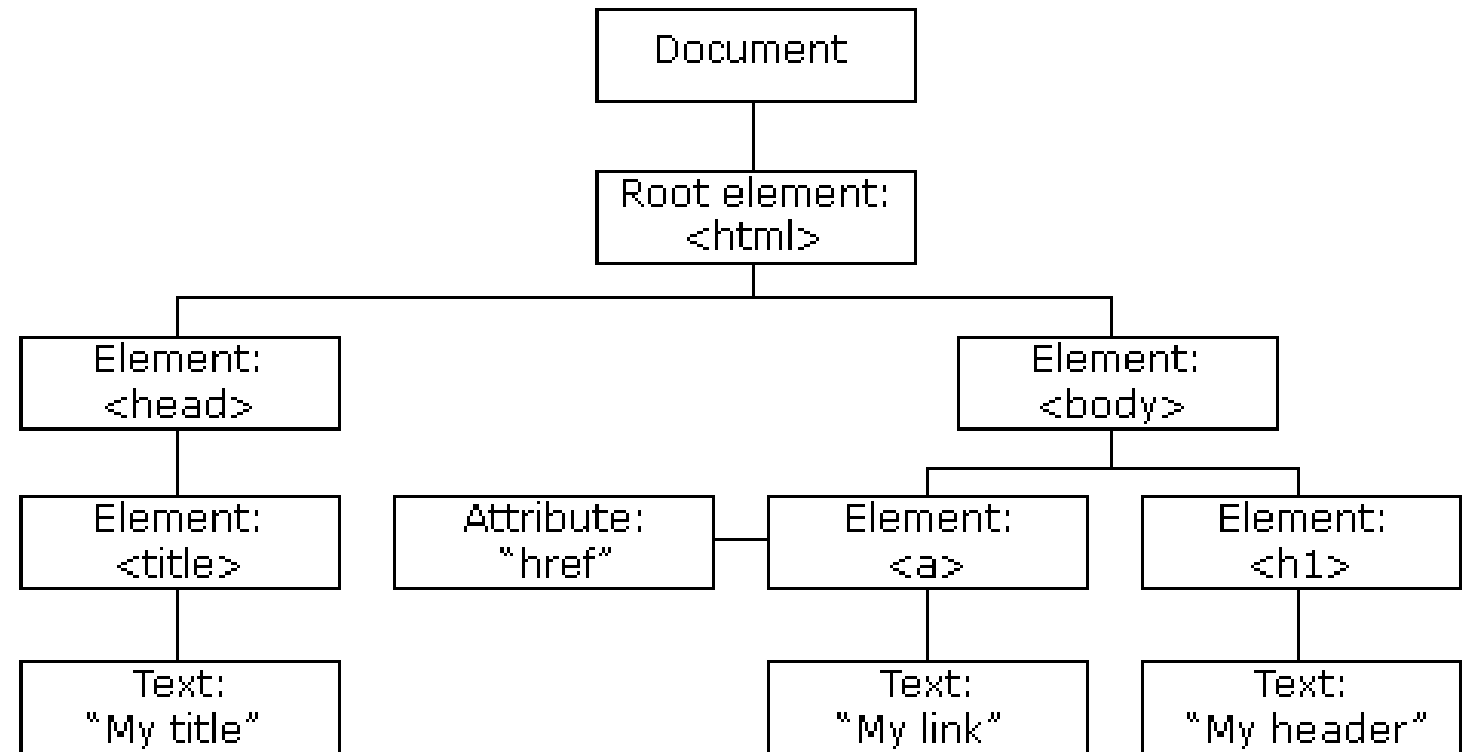# Reference

- W3Schools - Javascript
  - http://www.w3schools.com/js/

- Eloquent JavaScript. A Modern Introduction to Programming. Marijn Haverbeke.
  - http://eloquentjavascript.net/

Module 2 – The Browser

DOM

- When a web page is loaded, the browser creates a Document Object Model of the page.

- The HTML DOM model is constructed as a tree of objects

DOM

- The DOM is a W3C (World Wide Web Consortium) standard.

- The DOM defines a standard for accessing documents

"The W3C Document Object Model (DOM) is a platform and language-neutral interface that allows programs and scripts to dynamically access and update the content, structure, and style of a document."

DOM

- With the object model, JavaScript gets all the power it needs to create dynamic HTML:
  - JavaScript can change all the HTML elements in the page
  - JavaScript can change all the HTML attributes in the page
  - JavaScript can change all the CSS styles in the page
  - JavaScript can remove existing HTML elements and attributes
  - JavaScript can add new HTML elements and attributes
  - JavaScript can react to all existing HTML events in the page
  - JavaScript can create new HTML events in the page

DOM

- In the DOM, all HTML elements are defined as **objects**.
- The programming interface is the properties and methods of each object.
- A **property** is a value that you can get or set (like changing the content of an HTML element).
- A **method** is an action you can do (like add or deleting an HTML element).

File   Edit   Selection   Find   View   Goto   Tools   Project   Preferences   Help

dom1.html   ✕

```html
1    <!DOCTYPE html>
2    <html>
3    <body>
4
5    <h1>My First Page</h1>
6
7    <p id="demo"></p>
8
9    <script>
10   document.getElementById("demo").innerHTML = "Hello World!";
11   </script>
12
13   </body>
14   </html>
```

Line 14, Column 8

dom1.html   ✕

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My First Page

Hello World!

getElementById is a **method**, innerHTML is a **property**

DOM – Properties and Methods

- http://www.w3schools.com/js/js_htmldom_document.asp

1 - Changing HTML Content

document.getElementById(*id*).innerHTML = *new HTML*

Finding HTML Element by Id

File   Edit   Selection   Find   View   Goto   Tools   Project   Preferences   Help

dom1.html   ✕

```html
1   <!DOCTYPE html>
2   <html>
3   <body>
4
5   <h1>My First Page</h1>
6
7   <p id="demo"></p>
8
9   <script>
10  document.getElementById("demo").innerHTML = "Hello World!";
11  </script>
12
13  </body>
14  </html>
```

Line 14, Column 8

dom1.html   ✕

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My First Page

Hello World!

var myElement = document.getElementById("intro");
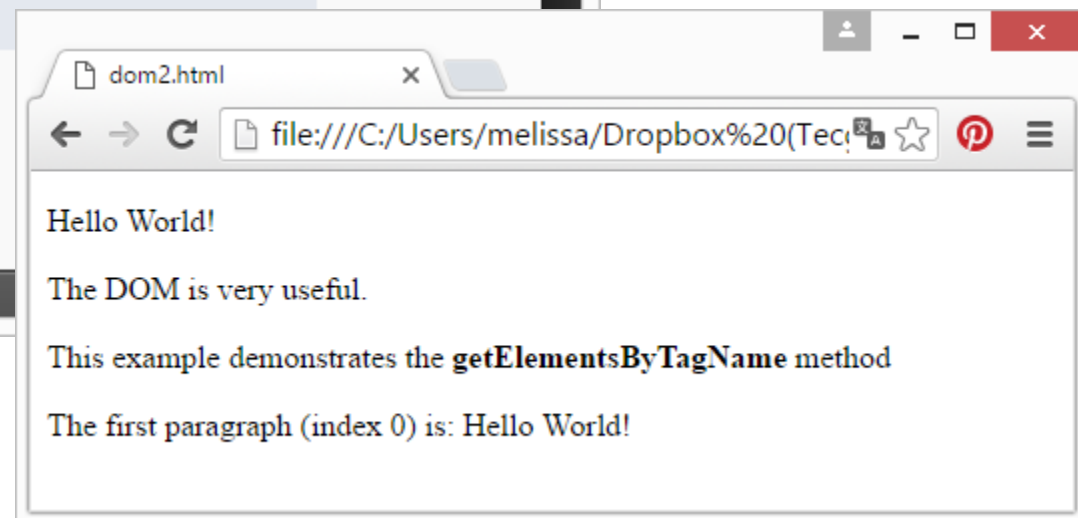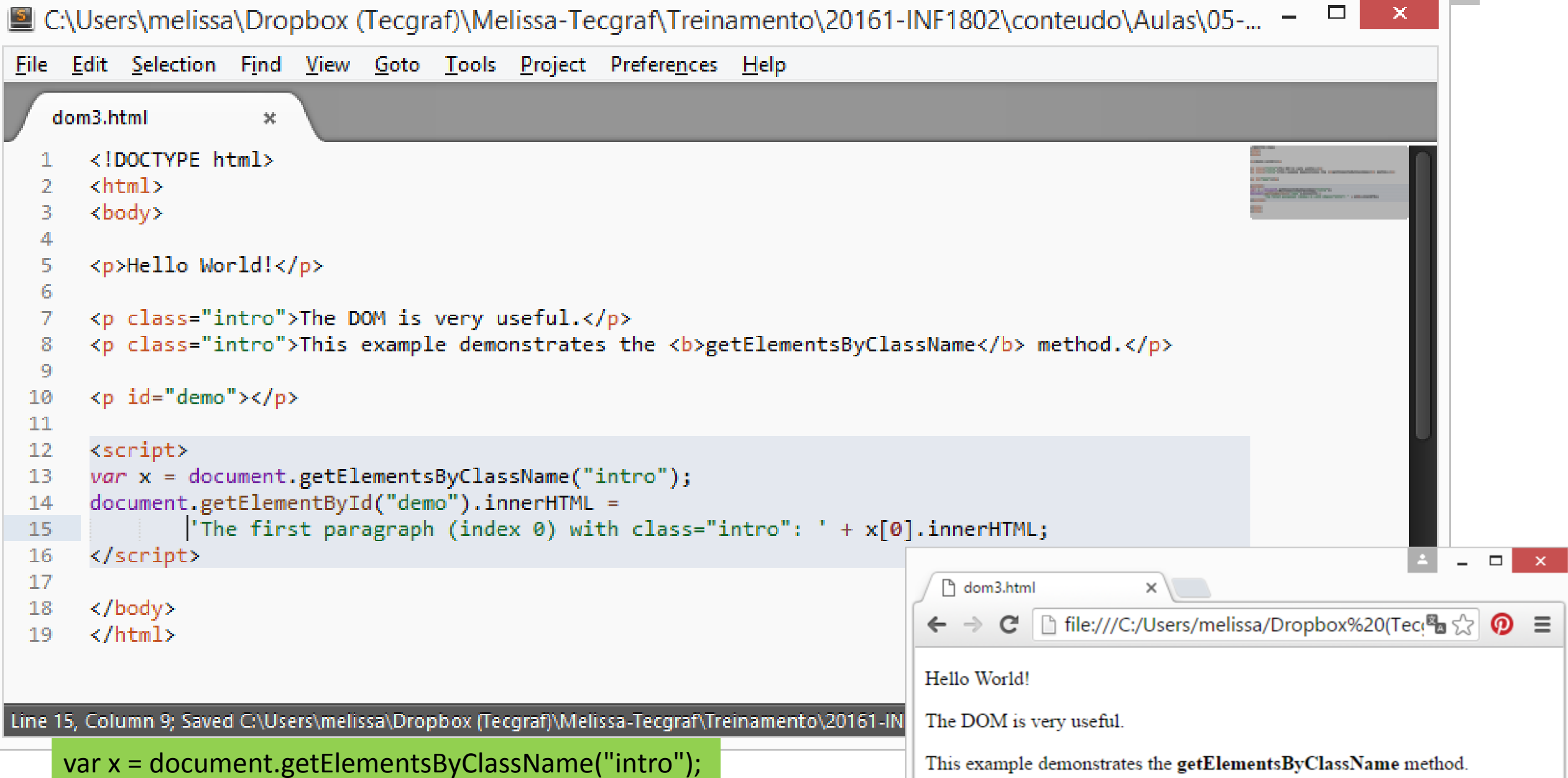
Finding HTML Elements by Tag Name

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File   Edit   Selection   Find   View   Goto   Tools   Project   Preferences   Help

dom2.html

```
 2   <html>
 3   <body>
 4
 5   <p>Hello World!</p>
 6
 7   <p>The DOM is very useful.</p>
 8   <p>This example demonstrates the <b>getElementsByTagName</b> method</p>
 9
10   <p id="demo"></p>
11
12   <script>
13   var x = document.getElementsByTagName("p");
14   document.getElementById("demo").innerHTML =
15       'The first paragraph (index 0) is: ' + x[0].innerHTML;
16   </script>
17
18   </body>
19   </html>
```

Line 15, Column 5

dom2.html

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Hello World!

The DOM is very useful.

This example demonstrates the **getElementsByTagName** method

The first paragraph (index 0) is: Hello World!

Example: finds all <p> elements
var x = document.getElementsByTagName("p");

Finding HTML Elements by Class Name

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dom3.html   ✕

```
 1    <!DOCTYPE html>
 2    <html>
 3    <body>
 4
 5    <p>Hello World!</p>
 6
 7    <p class="intro">The DOM is very useful.</p>
 8    <p class="intro">This example demonstrates the <b>getElementsByClassName</b> method.</p>
 9
10    <p id="demo"></p>
11
12    <script>
13    var x = document.getElementsByClassName("intro");
14    document.getElementById("demo").innerHTML =
15            'The first paragraph (index 0) with class="intro": ' + x[0].innerHTML;
16    </script>
17
18    </body>
19    </html>
```

Line 15, Column 9; Saved C:\Users\melissa\Dropbox (Tecgraf)\Melissa-Tecgraf\Treinamento\20161-IN

`var x = document.getElementsByClassName("intro");`

---

dom3.html   ✕

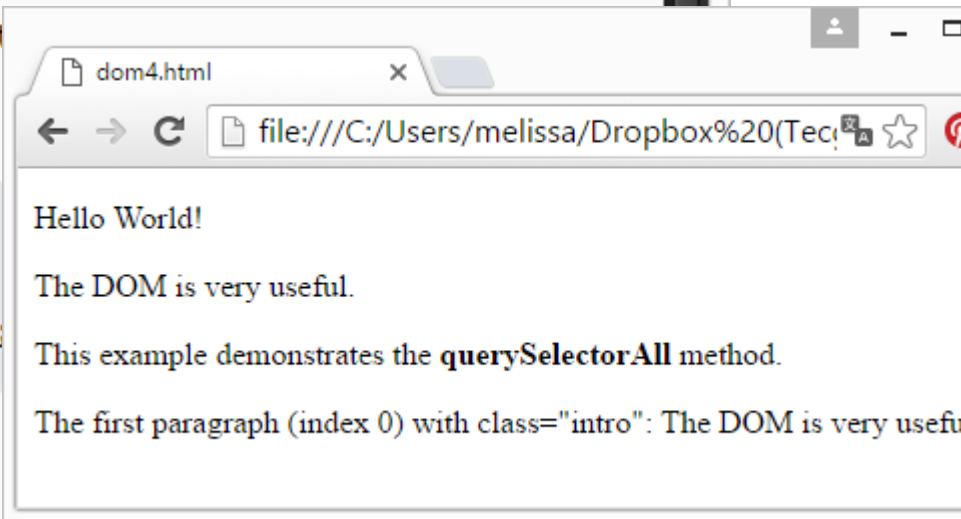file:///C:/Users/melissa/Dropbox%20(Tec

Hello World!

The DOM is very useful.

This example demonstrates the **getElementsByClassName** method.

The first paragraph (index 0) with class="intro": The DOM is very useful

Finding HTML Elements by CSS Selectors

```
dom4.html                    ×

1   <!DOCTYPE html>
2   <html>
3   <body>
4
5   <p>Hello World!</p>
6
7   <p class="intro">The DOM is very useful.</p>
8   <p class="intro">This example demonstrates the <b>querySelectorAll</b> met
9
10  <p id="demo"></p>
11  |
12  <script>
13  var x = document.querySelectorAll("p.intro");
14  document.getElementById("demo").innerHTML =
15      'The first paragraph (index 0) with class="intro": ' + x[0].innerHTML;
16  </script>
17
18  </body>
19  </html>
```

```
dom4.html                    ×

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Hello World!

The DOM is very useful.

This example demonstrates the querySelectorAll method.

The first paragraph (index 0) with class="intro": The DOM is very usefu
```

If you want to find all HTML elements that matches a specified CSS selector
(id, class names, types, attributes, values of attributes, etc), use the querySelectorAll() method.
Example: returns a list of all <p> elements with class="intro".
var x = document.querySelectorAll("p.intro");

DOM – more …

- http://www.w3schools.com/js/js_htmldom_elements.asp
  - Test yourself with exercises 1 - 5

File Edit

2 - Changing the Value of an Attribute

```
ex20.html
1
2
3  <body>
4
5  <img id="image" src="desenho1.JPG">
6
7  <script>
8  document.getElementById("image").src = "desenho2.JPG";
9  </script>
10
11  <p>The original image was desenho1, but the script changed it t
    desenho2</p>
12
13  </body>
14  </html>
```
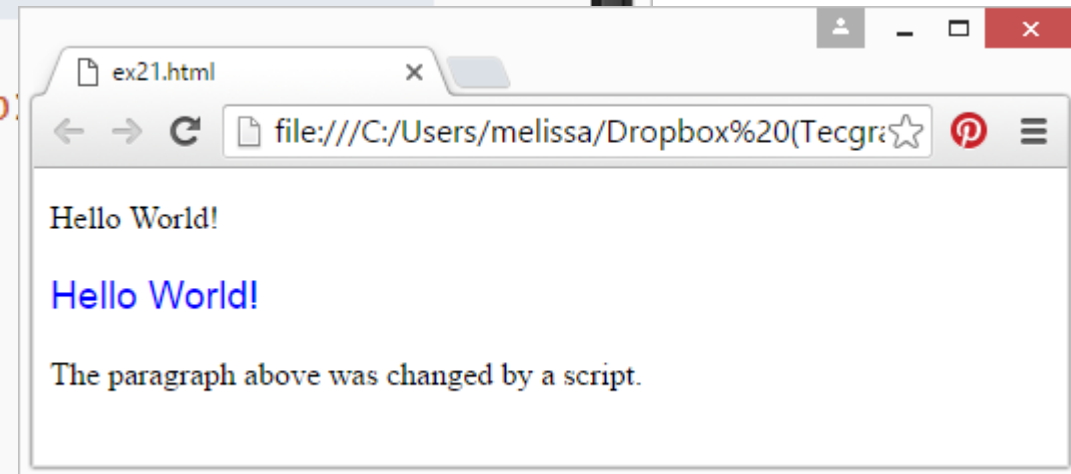
document.getElementById(*id*).*attribute=new value*

ex20.html

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The original image was desenho1, but the script changed it to desenho

ex21.h

3 - Changing HTML Style

```
1
2
3
4
5   <p id="p1">Hello World!</p>
6   <p id="p2">Hello World!</p>
7
8   <script>
9   document.getElementById("p2").style.color = "blue";
10  document.getElementById("p2").style.fontFamily = "Arial";
11  document.getElementById("p2").style.fontSize = "larger";
12  </script>
13
14  <p>The paragraph above was changed by a script.</p>
15
16  </body>
17  </html>
```

ex21.html ✕

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Hello World!

Hello World!

The paragraph above was changed by a script.

document.getElementById(*id*).style.*property=new style*

Changing HTML Style – more …

- http://www.w3schools.com/js/js_htmldom_css.asp
  - Test yourself with exercises 1 - 5

DOM Events

- The HTML DOM allows you to execute code when an event occurs.
- Events are generated by the browser when "things happen" to HTML elements:

DOM Events - Examples

- When a user clicks the mouse

- When a web page has loaded

- When an image has been loaded

- When the mouse moves over an element

- When an input field is changed

- When an HTML form is submitted

- When a user strokes a key

1 – Event: onclick (id)

ex22.html

```
1  <!DOCTYPE html>
2  <html>
3  <body>
4
5  <h1 id="id1">My Heading 1</h1>
6
7  <button type="button"
8  onclick="document.getElementById('id1').style.color = 'red'">
9  Click Me!</button>
10
11 </body>
12 </html>
```

Line 12, Column 8   Tab Size: 4   HTML

My Heading 1

Click Me!

My Heading 1

Click Me!

2 – Event: onclick (text)

ex23.html

```
1  <!DOCTYPE html>
2  <html>
3  <body>
4
5  <h1 onclick="this.innerHTML='Ooops!'">
   Click on this text!</h1>
6
7  </body>
8  </html>
```

Line 8, Column 8   Tab Size: 4   HTML
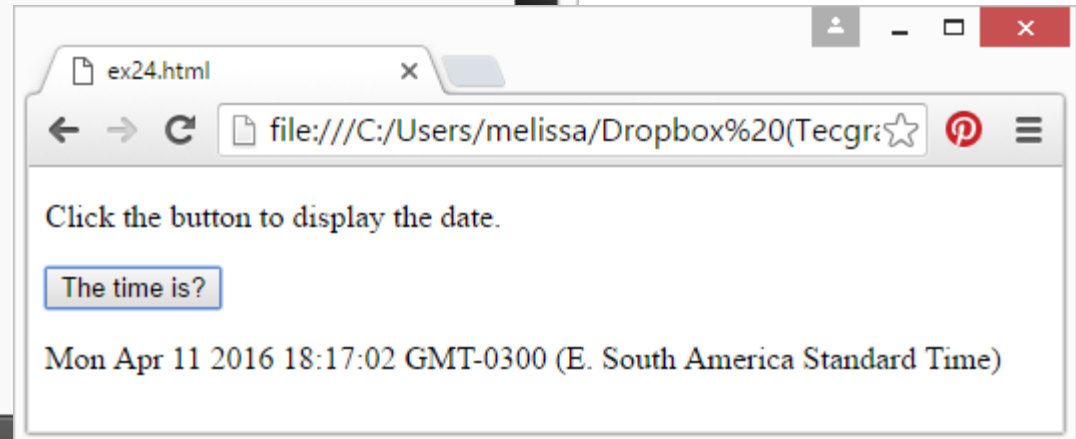
ex23.html
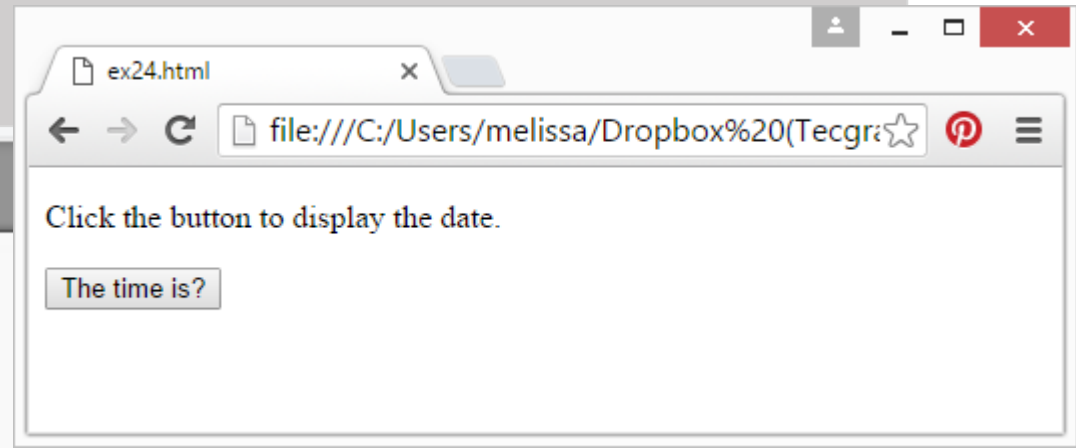file:///C:/Users/melissa/Dropbox%20(Tecgra

Click on this text!

ex23.html
file:///C:/Users/melissa/Dropbox%20(Tecgra

Ooops!

3 – Event: onclick (button)

```
 3    <body>
 4
 5    <p>Click the button to display the date.</p>
 6
 7    <button onclick="displayDate()">The time is?</button>
 8
 9    <script>
10    function displayDate() {
11        document.getElementById("demo").innerHTML = Date();
12    }
13    </script>
14
15    <p id="demo"></p>
16
17    </body>
18    </html> |
```
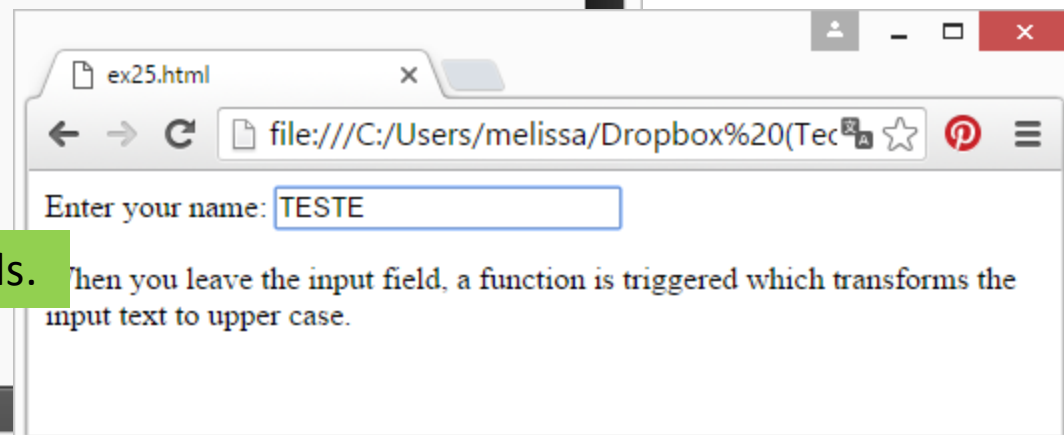
ex23.html

Line 18, Column 9

ex24.html

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Click the button to display the date.

The time is?

ex24.html

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Click the button to display the date.

The time is?

Mon Apr 11 2016 18:17:02 GMT-0300 (E. South America Standard Time)

4 – Event: onchange

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File   Ed

ex25.

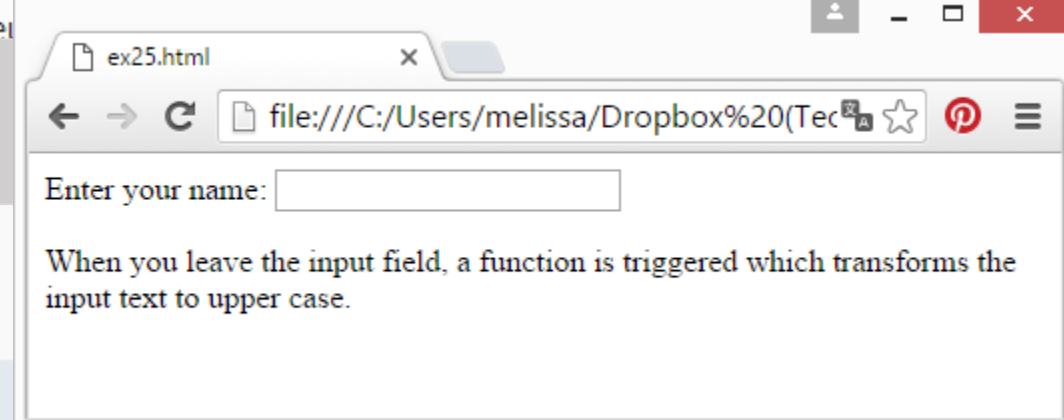```
 1 <!DOCTYPE html>
 2 <html>
 3 <head>
 4 <script>
 5 function myFunction() {
 6   var x = document.getElementById("fname");
 7   x.value = x.value.toUpperCase();
 8 }
 9 </script>
10 </head>
11 <body>
12
13 Enter your name: <input type="text" id="fname" onchange="myFunction()">
14 <p>When you leave the input field, a function is triggered which
    transforms the input text to upper case.</p>
15
16 </body>
17 </html>
```
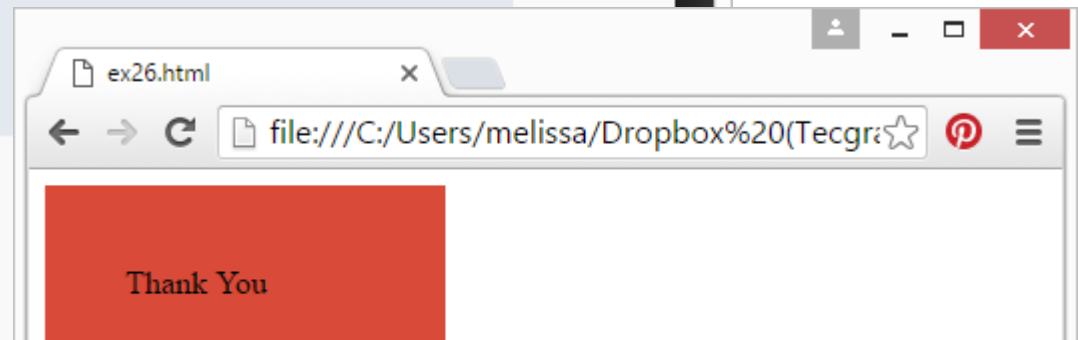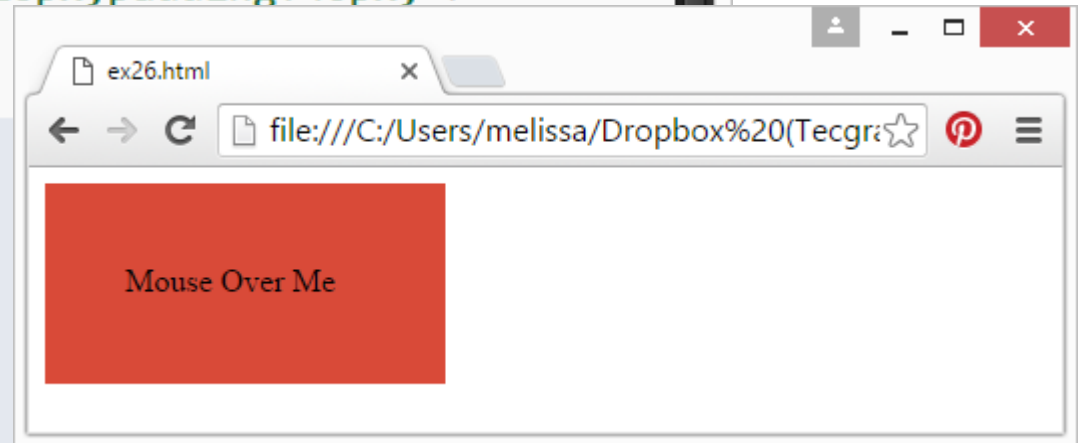
Line 17, Column 8

ex25.html

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Enter your name: [                    ]

When you leave the input field, a function is triggered which transforms the input text to upper case.

ex25.html

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Enter your name: [teste]

When you leave the input field, a function is triggered which transforms the input text to upper case.

ex25.html

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Enter your name: [TESTE]

When you leave the input field, a function is triggered which transforms the input text to upper case.

onchange: often used in combination with validation of input fields.

# 5 – Event: onmouseover; onmouseout

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File

ex:

```
 1 <!DOCTYPE html>
 2 <html>
 3 <body>
 4
 5 <div onmouseover="mOver(this)" onmouseout="mOut(this)"
 6 style="background-color:#D94A38;width:120px;height:20px;padding:40px;">
 7 Mouse Over Me</div>
 8
 9 <script>
10 function mOver(obj) {
11   obj.innerHTML = "Thank You"
12 }
13
14 function mOut(obj) {
15   obj.innerHTML = "Mouse Over Me"
16 }
17 </script>
18
19 </body>
20 </html>
```
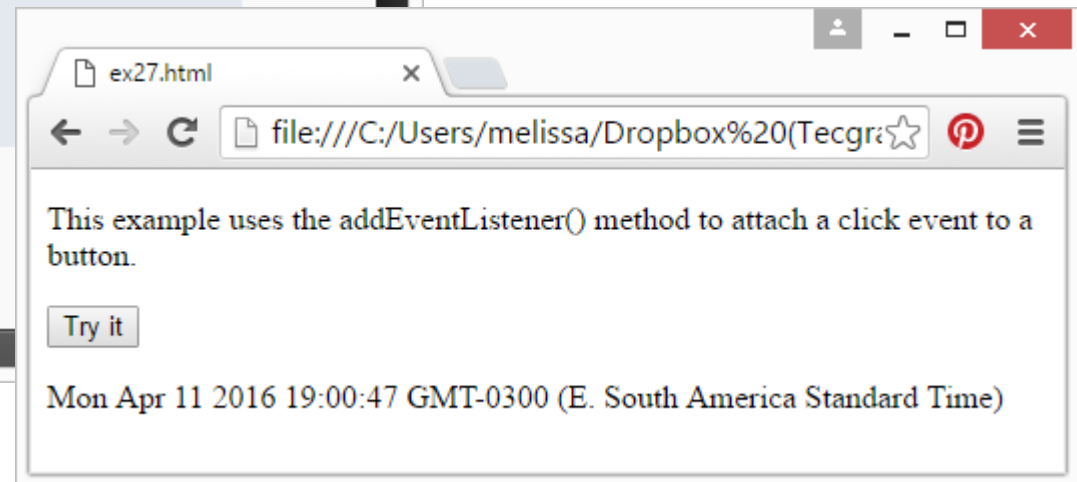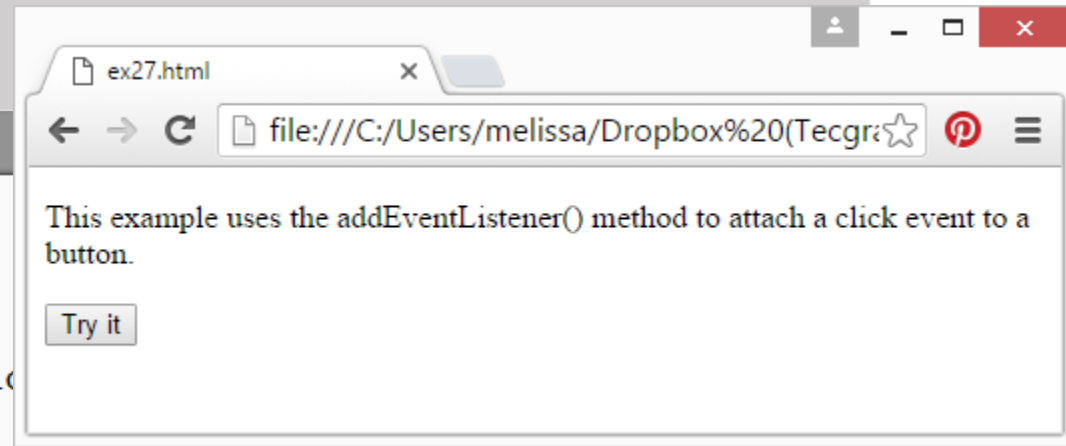
Line 20, Column 9

ex26.html

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Mouse Over Me

ex26.html

file:///C:/Users/melissa/Dropbox%20(Tecgr

Thank You

onmouseover/ onmouseout: triggered a function when the user mouses over, or out of, an HTML element

# DOM Events

- http://www.w3schools.com/js/js_htmldom_events.asp
  - Test yourself  with exercises 1 - 3

# Listener

```html
<!DOCTYPE html>
<html>
<body>

<p>This example uses the addEventListener() method to attach a click event to a button.</p>

<button id="myBtn">Try it</button>

<p id="demo"></p>

<script>
document.getElementById("myBtn").addEventListener("click", displayDate);

function displayDate() {
    document.getElementById("demo").innerHTML = Date();
}
</script>

</body>
</html>
```

Line 20, Column 9

---

ex27.html

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This example uses the addEventListener() method to attach a click event to a button.

Try it

---

ex27.html

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This example uses the addEventListener() method to attach a click event to a button.

Try it

Mon Apr 11 2016 19:00:47 GMT-0300 (E. South America Standard Time)

File Edit Sel

ex28.html

```html
2  <html>
3  <body>
4
5  <p>This example uses the addEventListener() method to add many events on the same
   button.</p>
6
7  <button id="myBtn">Try it</button>
8
9  <p id="demo"></p>
10
11 <script>
12 var x = document.getElementById("myBtn");
13 x.addEventListener("mouseover", myFunction);
14 x.addEventListener("click", mySecondFunction);
15 x.addEventListener("mouseout", myThirdFunction);
16
17 function myFunction() {
18     document.getElementById("demo").innerHTML += "Moused over!<br>";
19 }
20
21 function mySecondFunction() {
22     document.getElementById("demo").innerHTML += "Clicked!<br>";
23 }
24
25 function myThirdFunction() {
26     document.getElementById("demo").innerHTML += "Moused out!<br>";
27 }
28 </script>
29
30 </body>
31 </html>
32  |
```

Line 32, Column 1   Tab

---

ex28.html ✕

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This example uses the addEventListener() method to add many events same button.

[Try it]

---

ex28.html ✕

← → C 🔒 file:///C:/Users/melissa/Dropbox%20(Tecgr☆ 📌 ≡

This example uses the addEventListener() method to add many events on the same button.

[Try it]

Moused over!
Moused out!
Moused over!
Moused out!
Moused over!
Clicked!
Moused out!

Example – Image Gallery