JQUERY

Ανάπτυξη Διαδικτυακών Συστημάτων & Εφαρμογών

Τμ. Μηχανικών Πληροφορικής και Ηλεκτρονικών Συστημάτων

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What is jQuery?

- jQuery is a fast and concise JavaScript Library that simplifies HTML document traversing, event handling, animating, and Ajax interactions for rapid web development. (jQuery.com)

Why learn jQuery?

- Write less, do more:
  - *$("p.neat").addClass("ohmy").show("slow");*
  - *$("p.neat")*
    .addClass("ohmy")
    .show("slow");
- Performance
- Plugins
- It's standard
- … and fun!

window.onload

- We cannot use the DOM before the page has been constructed. jQuery gives us a more compatibile way to do this.
  - The DOM way

```
window.onload = function() { // do stuff with the DOM }
```

  - The direct jQuery translation

```
$(document).ready(function() { // do stuff with the DOM });
```

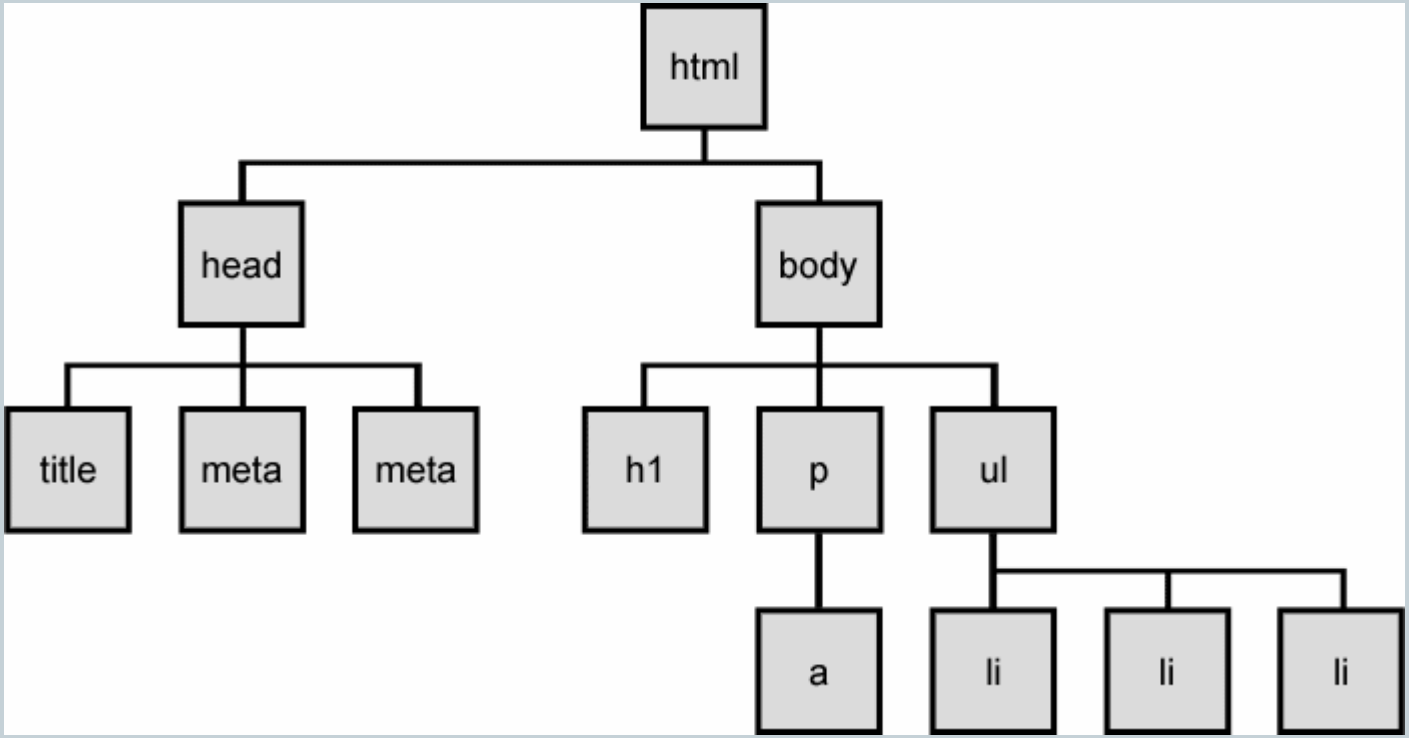
  - The jQuery way

```
$(function() { // do stuff with the DOM });
```

Aspects of the DOM and jQuery

- **Identification:** how do I obtain a reference to the node that I want.
- **Traversal:** how do I move around the DOM tree.
- **Node Manipulation:** how do I get or set aspects of a DOM node.
- **Tree Manipulation:** how do I change the structure of the page.

The DOM tree



Selecting groups of DOM objects

name	description
getElementById	returns array of descendents with the given tag, such as "div"
getElementsByTagName	returns array of descendents with the given tag, such as "div"
getElementsByName	returns array of descendents with the given name attribute (mostly useful for accessing form controls)
querySelector *	returns the first element that would be matched by the given CSS selector string
querySelectorAll *	returns an array of all elements that would be matched by the given CSS selector string

jQuery node identification

```
// id selector
var elem = $("#myid");

// group selector
var elems = $("#myid, p");

// context selector
var elems = $("#myid > div p");

// complex selector
var elems = $("#myid > h1.special:not(.classy)");
```

jQuery Selectors:
http://api.jquery.com/category/selectors/

jQuery / DOM comparison

DOM method	jQuery equivalent
getElementById("id")	$("#id")
getElementsByTagName("tag")	$("tag")
getElementsByName("somename")	$("[name='somename']")
querySelector("selector")	$("selector")
querySelectorAll("selector")	$("selector")

jQuery terminology

- the jQuery function

  refers to the global jQuery object or the $ function depending on the context

- a jQuery object

  the object returned by the jQuery function that often represents a group of elements

- selected elements

  the DOM elements that you have selected for, most likely by some CSS selector passed to the jQuery function and possibly later filtered further

The jQuery object

- The $ function always (even for ID selectors) returns an array-like object called a jQuery object.
- The jQuery object wraps the originally selected DOM objects.
- You can access the actual DOM object by accessing the elements of the jQuery object.

```
// false
document.getElementById("myid") == $("#myid");
document.querySelectorAll("p") == $("p");
// true
document.getElementById("myid") == $("#myid")[0];
document.getElementById("myid") == $("#myid").get(0);
document.querySelectorAll("p")[0] == $("p")[0];
```

Using $ as a wrapper

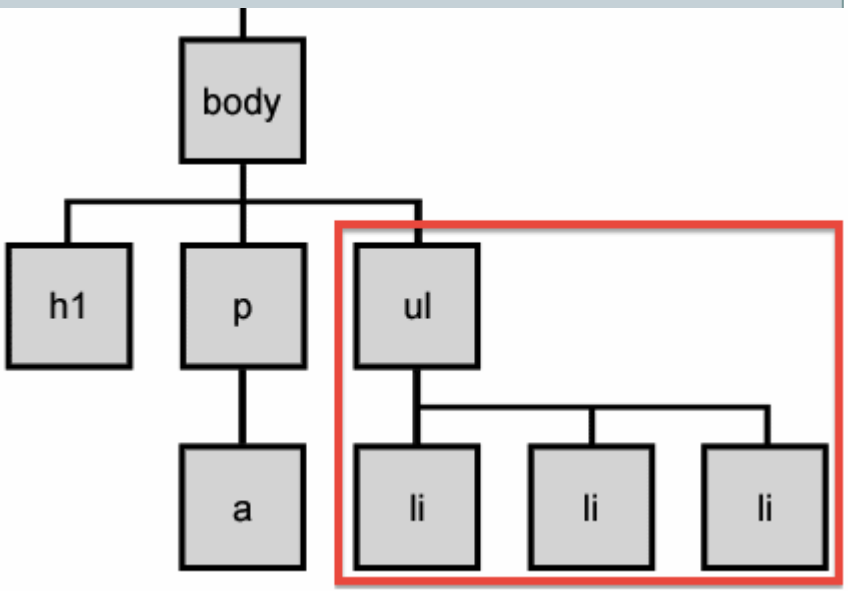
- $ adds extra functionality to DOM elements
- passing an existing DOM object to $ will give it the jQuery upgrade

```
// convert regular DOM objects to a jQuery object
var elem = document.getElementById("myelem");
Jquery_elem = $(elem);
var elems = document.querySelectorAll(".special");
Jquery_elems = $(elems);
```

DOM context identification

- You can use querySelectorAll() and querySelector() on any DOM object.
- When you do this, it simply searches from that part of the DOM tree downward.
- Programmatic equivalent of a CSS context selector

```
var list =
document.getElementsByTagName("ul")[0];
var specials =
list.querySelectorAll('li.special');
```



find / context parameter

- jQuery gives two identical ways to do contextual element identification

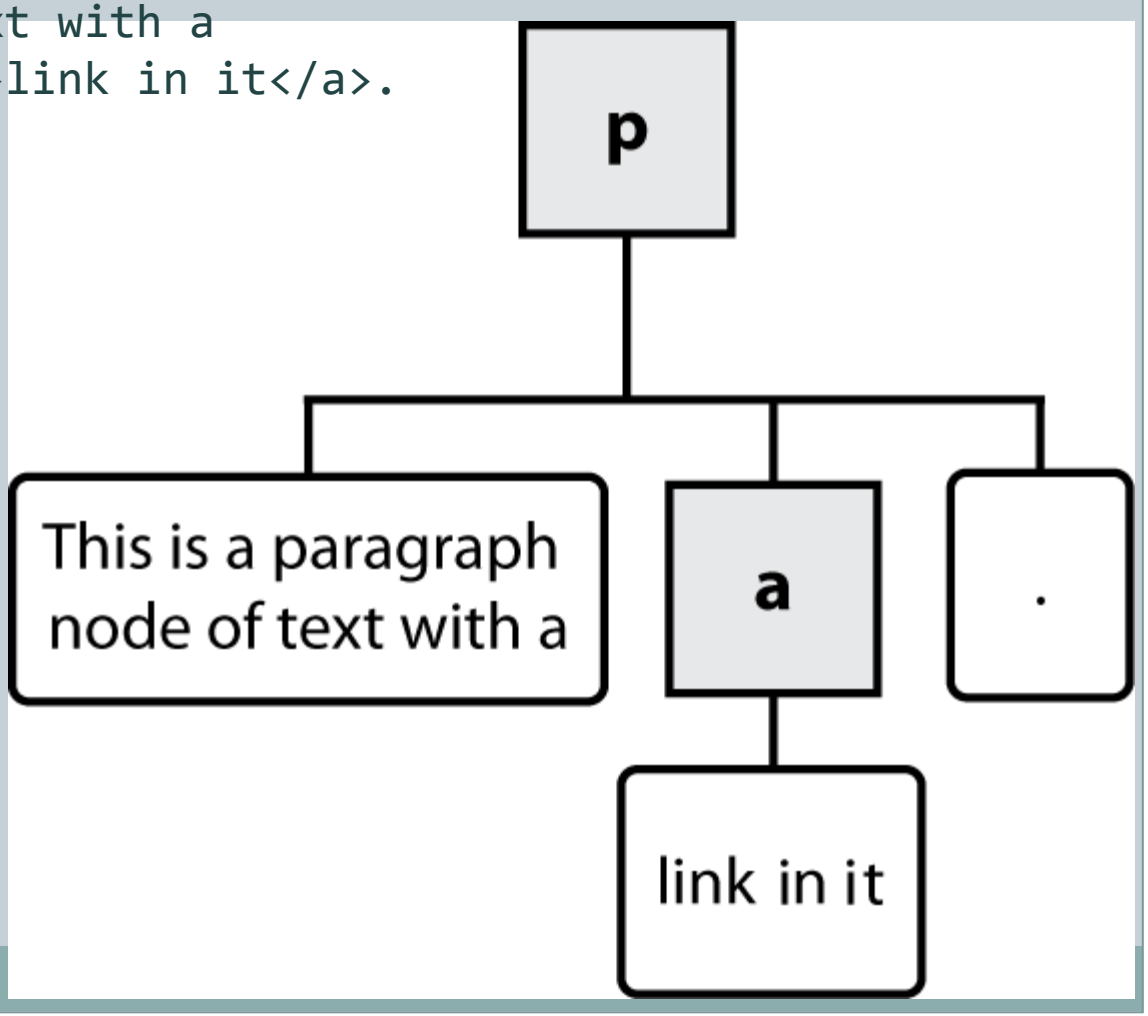
```
var elem = $("ul");
// These are identical
var specials = $("li.special", elem);
var specials = elem.find("li.special");

var specials = $("ul").find("li.special");

var specials = $("ul li.special");
var specials = $("#myid > li.special");
```

Types of DOM nodes

```
<p>
This is a paragraph of text with a
<a href="/path/page.html">link in it</a>.
</p>
```



Traversing the DOM tree

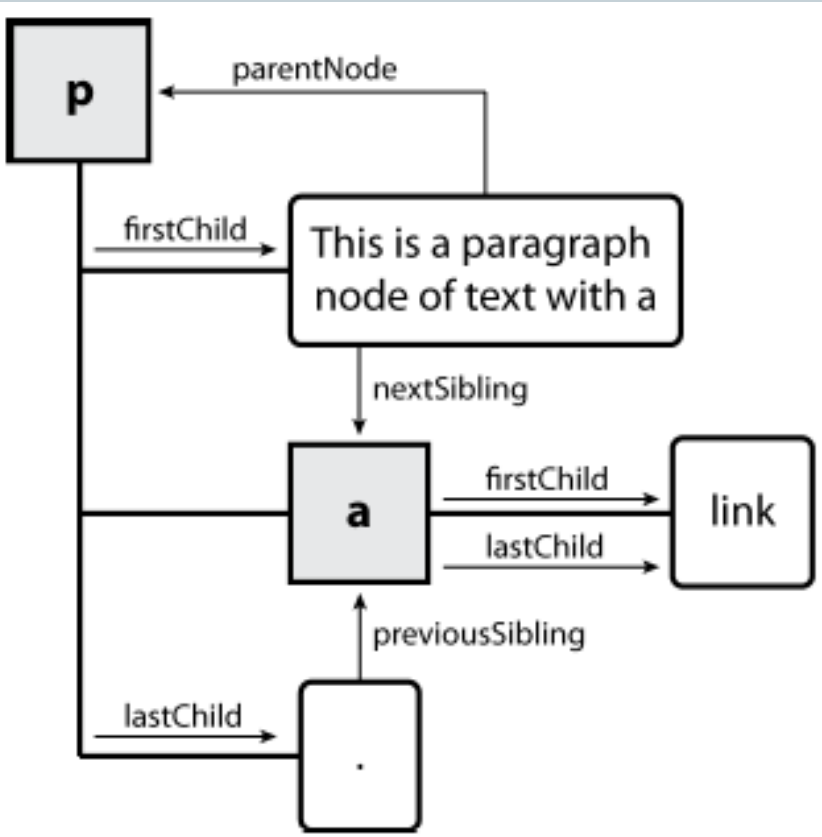
name(s)	description
firstChild, lastChild	start/end of this node's list of children
childNodes	array of all this node's children
nextSibling, previousSibling	neighboring nodes with the same parent
parentNode	the element that contains this node

complete list of DOM node properties:
http://www.w3schools.com/dom/dom_node.asp

DOM tree traversal example


```
<p id="foo">This is a paragraph of text with a
<a href="/path/to/another/page.html">link</a>.</p>
```

HTML



Elements vs text nodes


```
<div>
        <p>
                This is a paragraph of text with a
                <a href="page.html">link</a>.
        </p>
</div>
```

HTML

- Q: How many children does the div above have?
- A: 3
  - an element node representing the <p>
  - two text nodes representing "\n\t" (before/after the paragraph)
- Q: How many children does the paragraph have? The a tag?

jQuery tutorials

- Code Academy

  http://www.codecademy.com/courses/you-and-jquery/0?curriculum_id=4fc3018f74258b00003001f0f#!/exercises/0

- Code School:

  http://www.codeschool.com/courses/jquery-air-first-flight

jQuery Syntax For Event Methods

Example:

To assign a click event to all paragraphs on a page, you can do this:

```
$("p").click();
```

The next step is to define what should happen when the event fires. You must pass a function to the event:

Τρόπος 1:

```
$("p").click(function(){
    // action goes here!!
});
```

Τρόπος 2:

```
$("p").click(do_it);


….

function do_it() {
      ……
}
```

Commonly Used jQuery Event Methods

click()

- The click() method attaches an event handler function to an HTML element.
- The function is executed when the user clicks on the HTML element.
- The following example says: When a click event fires on a <p> element; hide the current <p> element:

```
$("p").click(function(){
        $(this).hide();
});
```

- Try it from this link: http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_click

Commonly Used jQuery Event Methods

mouseenter()

- The mouseenter() method attaches an event handler function to an HTML element.

- The function is executed when the mouse pointer enters the HTML element.

```
$("#p1").mouseenter(function(){
        alert("You entered p1!");
});
```

- Try it from this link: http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_mouseenter

For a full list of jQuery events, see the API:

http://api.jquery.com/category/events/

jQuery Effects

- With jQuery, you can do the following effects:

  Hide, Show, Toggle, Slide, Fade, and Animate

jQuery hide() and show()

```
$("#hide").click(function(){
        $("p").hide();
});

$("#show").click(function(){
        $("p").show();
});
```

See an example from this link: http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_hide_show

You can also control the speed of the hiding by providing a parameter:

```
$("button").click(function(){
        $("p").hide(1000);
 });
```

See an example in this link:

http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_hide_slow

jQuery Sliding Methods

- With jQuery you can create a sliding effect on elements.
- jQuery has the following slide methods:
  - slideDown()
  - slideUp()
  - slideToggle()
- See an example from this link: http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_slide_down

jQuery Animations - The animate() Method

Example:

The following example demonstrates a simple use of the animate() method; it moves a element to the right, until it has reached a left property of 250px:

```
$("button").click(function(){
        $("div").animate({left:'250px'});
 });
```

Try it in this link:

jQuery Animations - The animate() Method

Multiple properties can be animated at the same time:

```
$("button").click(function(){
        $("div").animate({
                left:'250px',
                opacity:'0.5',
                 height:'150px',
                width:'150px'
        });
});
```

Try it in this link:
http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_animation1_multicss

For a list of jQuery effects, see the API:

http://api.jquery.com/category/effects/

jQuery – Get content and attributes

jQuery contains powerful methods for changing and manipulating HTML elements and attributes.

Get Content - text(), html(), and val() :

Three simple, but useful, jQuery methods to get content are:

text() - Sets or returns the text content of selected elements

html() - Sets or returns the content of selected elements (including HTML markup)

val() - Sets or returns the value of form fields

- The following example demonstrates how to get content with the jQuery text() and html() methods:

```
$("#btn1").click(function(){
    alert("Text: " + $("#test").text());
});

$("#btn2").click(function(){
    alert("HTML: " + $("#test").html());
});
```

- See an example from this link: http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_dom_html_get

- The following example demonstrates how to get the value of an input field with the jQuery val() method:

```
$("#btn1").click(function(){
        alert("Value: " + $("#test").val());
});
```

See an example from this link: http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_dom_val_get

jQuery - Set Content and Attributes

- We can use the same three methods to set content:
  - text() - Sets or returns the text content of selected elements
  - html() - Sets or returns the content of selected elements (including HTML markup)
  - val() - Sets or returns the value of form fields

- The following example demonstrates how to set content with the jQuery text(), html(), and val() methods:http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_dom_html_set

.each

- Με αυτή τη μέθοδο διατρέχουμε όλα τα dom στοιχεία ενός jquery object:

```
<input value='1' id='x1'><input value='1' id='x2'>
<input value='1' id='x3'>
<input value='1' id='x4'>
<span id='result'></span>
……

var s=0;
$('input').each( function(i,x) {  s += $(x).val(); });
$('#result').text(s);
```

jQuery - Add and Remove Elements

jQuery append()

- The jQuery append() method inserts content AT THE END of the selected HTML elements.

```
$("p").append("Some appended text.");
```

See an example from this link:
http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_html_append

jQuery prepend()

- The jQuery prepend() method inserts content AT THE BEGINNING of the selected HTML elements.

```
$("p").prepend("Some prepended text.");
```

- See an example from this link: http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_html_prepend

- You can also add multiple elements at once:

```
function appendText() {
var txt1 = "<p>Text.</p>"; // Create element with HTML
var txt2 = $("<p></p>").text("Text."); // Create with jQuery
var txt2 = $("<p>Text.</p>"); // Create with jQuery (2)

var txt3 = document.createElement("p"); // Create with DOM
txt3.innerHTML = "Text.";
$(“body").append(txt1, txt2, txt3); // Append the new elements
}
```

See the example from this link:
http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_html_append2

jQuery remove()

- The jQuery remove() method removes the selected element(s) and its child elements.

```
$("#div1").remove();
```

- See the example from this link:http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_dom_remove

jQuery – Manipulating CSS elements

- jQuery has several methods for CSS manipulation.
  - addClass() - Adds one or more classes to the selected elements
  - removeClass() - Removes one or more classes from the selected elements

- The following stylesheet will be used for all the examples below:

```
.important
{
        font-weight:bold;
        font-size:xx-large;
}
.blue
{
        color:blue;
}
```

jQuery addClass()

- The following example shows how to add class attributes to different elements.

```
$("button").click(function(){
        $("h1,h2,p").addClass("blue");
        $("div").addClass("important");
});
```

- See the example from this link: http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_dom_addclass

jQuery removeClass()

- The following example shows how to remove a specific class attribute from different elements

```
$("button").click(function(){
        $("h1,h2,p").removeClass("blue");
});
```

- See an example from this link: http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_dom_removeclass

jQuery css()

- The css() method sets or returns one or more style properties for the selected elements.
- To return the value of a specified CSS property, use the following syntax:

```
css("propertyname");
```

- The following example will return the background-color value of the FIRST matched element:

```
$("p").css("background-color");
```

- See the example below: http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_css_getcolor

jQuery css()

- To set a specified CSS property, use the following syntax:

```
css("propertyname","value");
```

- The following example will set the background-color value for ALL matched elements:

```
$("p").css("background-color","yellow");
```

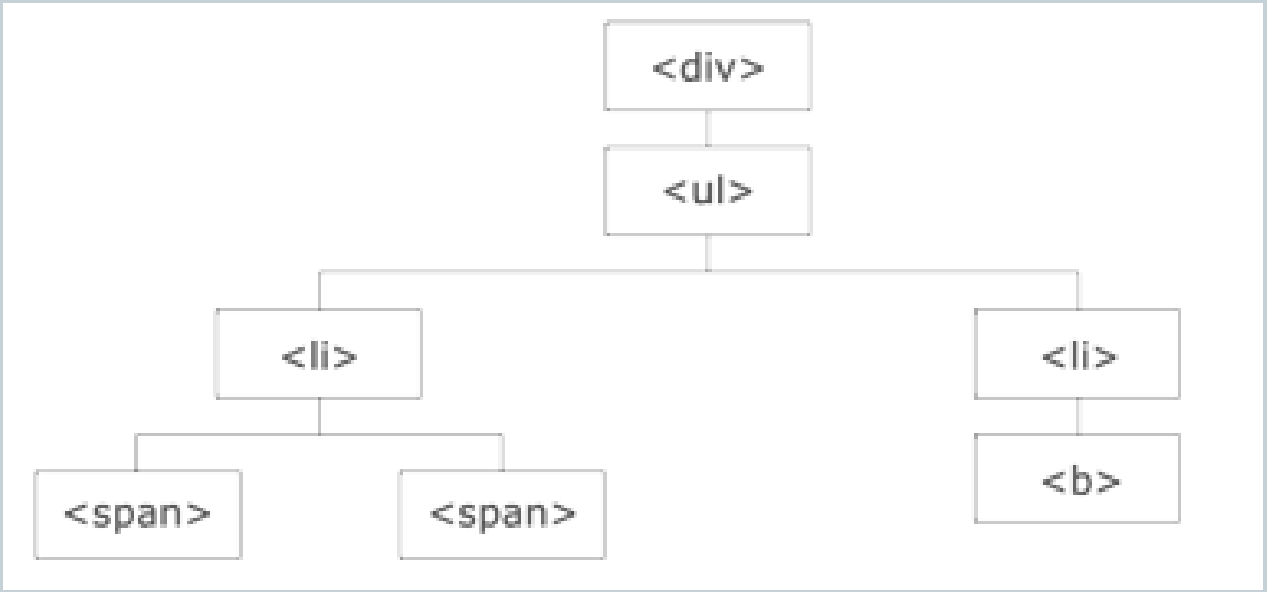
- See the example in this link: http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_css_setcolor

jQuery - Traversing

jQuery traversing, which means "move through", are used to "find" (or select) HTML elements based on their relation to other elements. Start with one selection and move through that selection until you reach the elements you desire.

Traversing

- The image below illustrates a family tree. With jQuery traversing, you can easily move up (ancestors), down (descendants) and sideways (siblings) in the family tree, starting from the selected (current) element. This movement is called traversing



Ancestors

- An ancestor is a parent, grandparent, great-grandparent, and so on. With jQuery you can traverse up the DOM tree to find ancestors of an element.

- Three useful jQuery methods for traversing up the tree are:
  - parent()
  - parents()
  - parentsUntil()

- The **parent()** method returns the direct parent element of the selected element.
- This method only traverse a single level up the tree.
- The following example returns the direct parent element of each elements:

```
$(document).ready(function(){
        $("span").parent();
});
```

See the example here: http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_parent

- The **parents()** method returns all ancestor elements of the selected element, all the way up to the document's root element (<html>).
- The following example returns all ancestors of all elements:

```
$(document).ready(function(){
        $("span").parents();
  });
```

See the example:
http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_parents

- The **parentsUntil()** method returns all ancestor elements between two given arguments.
- The following example returns all ancestor elements between a and a element:

```
$(document).ready(function(){
        $("span").parentsUntil("div");
});
```

See the example here:
http://www.w3schools.com/jquery/tryit.asp?filename=tryjquery_parentsuntil

Descendants and Siblings

- Two useful jQuery methods for traversing down the tree are:
  - children()
  - find()

- There are many useful jQuery methods for traversing sideways in the tree:
  - siblings()
  - next()
  - nextAll()
  - nextUntil()
  - prev()
  - prevAll()
  - prevUntil()

Reminder

- You can write your own code using JQuery API: http://api.jquery.com/
- You can use the code of other people: http://plugins.jquery.com/

Τακτικές στο Jquery (και γενικά στην js)

- Ορίσματα/options σε συναρτήσεις ➔ αντικείμενα

```
myfunc( {'name':'Antonis', 'surname': 'Sidiropoulos'})

function myfunc(opts) {
     do_with_data(opts['name'], opts['birthdate'],
opts['fathersname']);
}
```

- Έτσι συνήθως χρησιμοποιείται ένα αντικείμενο που περιέχει όλα τα ορίσματα που θέλουμε να δώσουμε προς την συνάρτηση.
- Συνήθως μέσα στην συνάρτηση ορίζουμε default τιμές για τις ιδιότητες του αντικειμένου που δεν έχουν οριστεί.
- Η χρήση των αντικειμένων ως ορίσματα γίνεται με “call by reference”

Τακτικές στο Jquery (και γενικά στην js)

- Anonymous functions

```
function p1(opts) {
      … // do things
      return 'OK';
}
var f1 = function (opts) {
      … // do other things
      return 'OK';
}
var f2 = f1  //αντιγραφή του δείκτη προς την συνάρτηση.
var p2 = p1  //αντιγραφή του δείκτη προς την συνάρτηση.
var x1 = f1()  //κλήση της συνάρτησης
var x2 = f2()  //κλήση της ίδιας συνάρτησης
var x3 = p2()  //κλήση της p2 άρα της p1.
```

- Όταν μετά από ένα όνομα συνάρτησης δεν υπάρχει (), τότε παίρνουμε τον pointer προς την συνάρτηση,
- Όταν μετά από ένα όνομα συνάρτησης υπάρχει (), τότε καλείται η συνάρτηση