J is for Jedi?

Wheel you use,
invent it you don't.

Our jQuery Agenda

- Intro to the jQuery library
- $
- Selectors
- The jQuery Object
- Creating DOM elements
- DOM manipulations:
  - Append(), Prepend(), After(), Before()
  - Remove()
  - addClass(), removeClass()
  - atr(name of attribute,value)
- document.ready
- library
- CDN
- JQuery object
- Collection

Agenda

- Chaining
- Events Listeners
  - Click()
  - Bind()
  - Blur()
  - Mouseenter()
  - DOMContentLoaded
  - Load
- A bit about data
- Iterating on child elements
- toggleClass
- On, Off (activating and disabling events)
- This, $(event.**target**)
- **$(this)**
- Event trigger
- each

jQuery intro

Up until now, we have been enjoying vanilla (JS)

not knowing there are many ways to make it tastier...

- Meet jQuery

jQuery has changed the way millions write JavaScript.

jQuery intro

jQuery is a fast, small, and feature-rich JavaScript **library**.

Library – A collection of reusable code

Making our life easier!

- HTML document traversal and manipulation
- event handling
- Animation
- Ajax

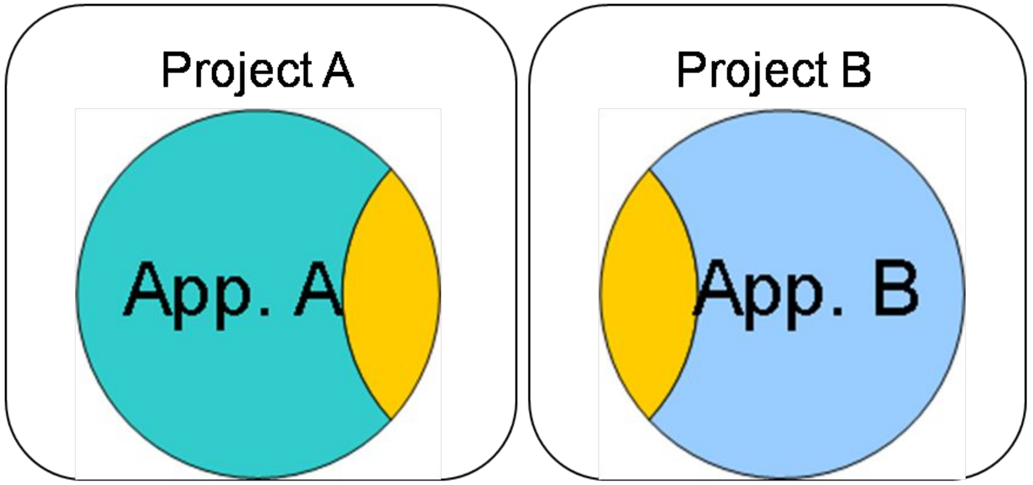
What comes with a library?

Library is a new dependency

- An API we need to learn
- Possible conflicts
- Adds code we never use

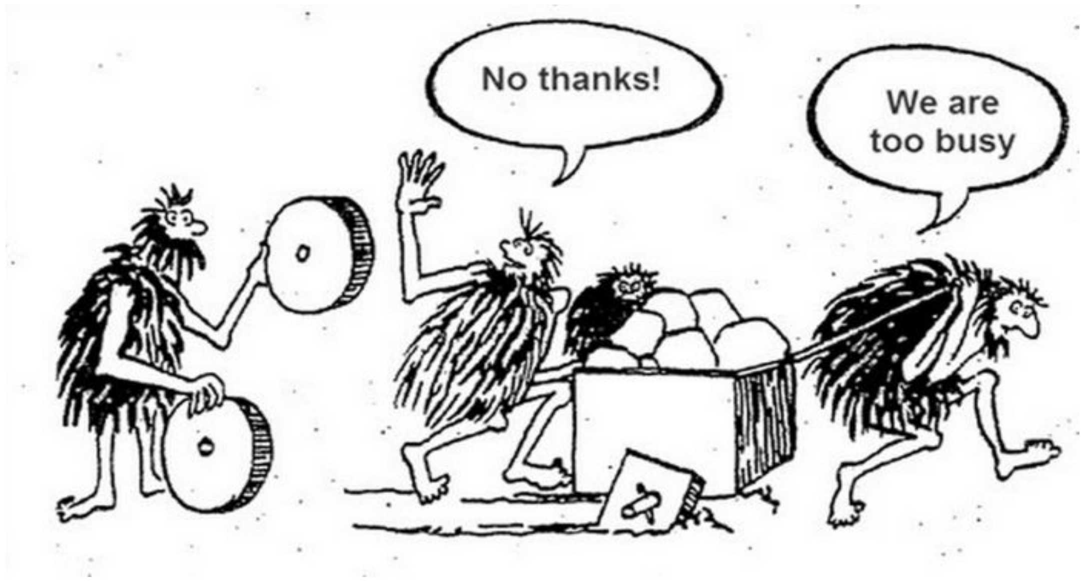
• The cost/benefit ratio for jQuery is very high

Why use a library?



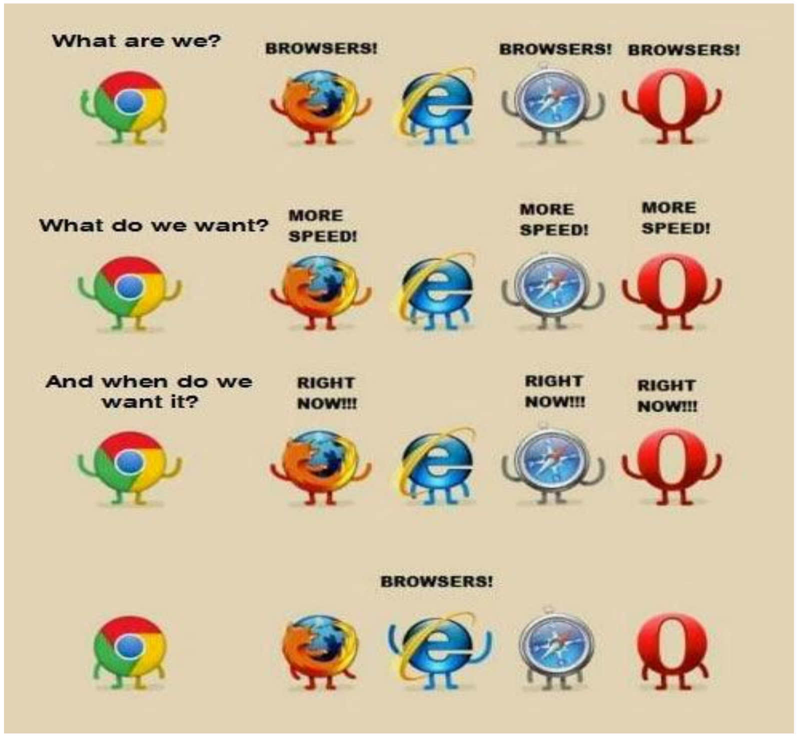
Code Reuse

Why use a library?



Use the wheel, don’t re-invent it.

Why use a library?



Cross browser support

From ninja to Jedi in a few ~~easy~~ steps

Step 1

Include the jQuery script in our HTML

There are two options to do that:

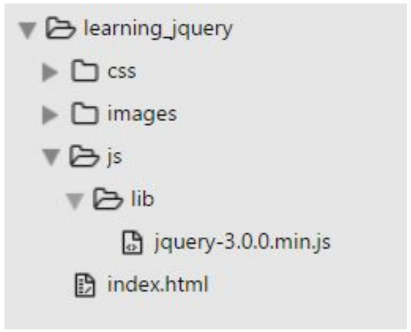
- Download the library from the jQuery website and put it in our JS folder

- Place a direct link to a jQuery CDN

Option 1

- Download the library

- Create a sub folder under our JS folder called lib (in order to distinguish external libraries and our own code)



```
▼ learning_jquery
  ▶ css
  ▶ images
  ▼ js
    ▼ lib
        jquery-3.0.0.min.js
    index.html
```

- Add a script tag to our HTML code with the path:

```
<script src="./js/lib/jquery-3.0.0.min.js"></script>
```

Option 2

- Just add the CDN URL in the script tag instead of your folder path

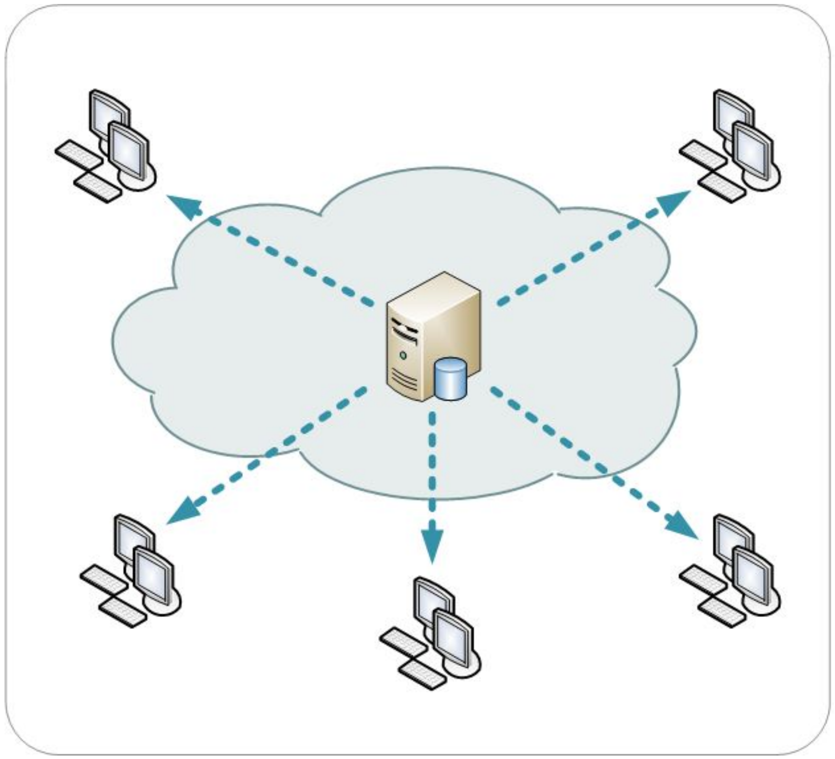
```html
<script src="https://code.jquery.com/jquery-3.0.0.min.js"></script>
```

CDN - Content Delivery Network
Distributed network of servers that delivers Web content based on the geographic locations

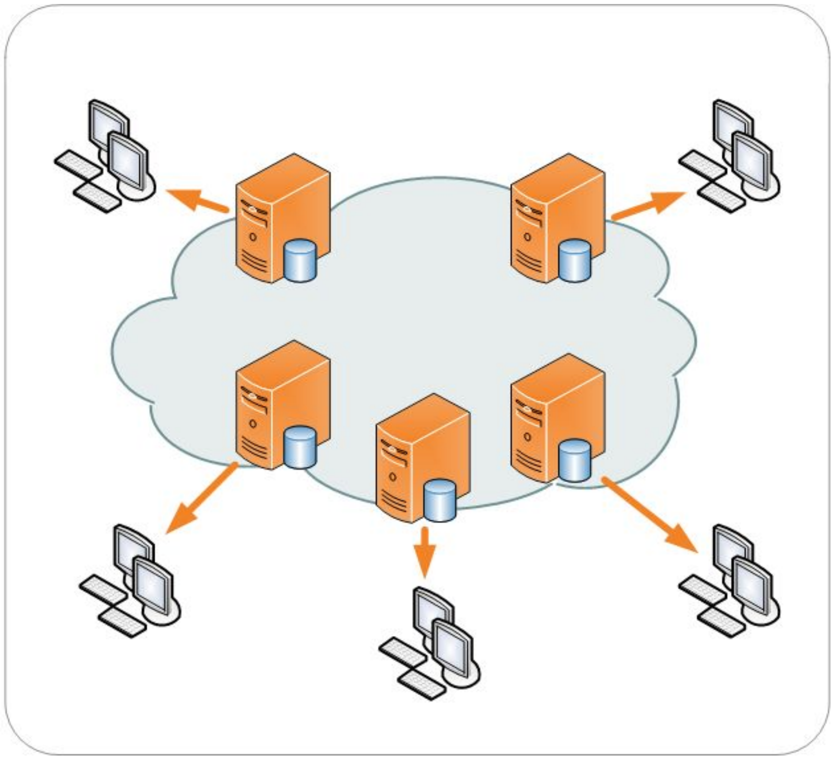
Option 2

- CDN - Content Delivery Network

Single server distribution



CDN distribution



Option 2

Using a CDN is always preferable

- Google servers are more reliable
- You don't pay for traffic

Unless you want to be able to code offline (like on a plane)

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Enjoy Inflight Wi-Fi
Available now for FREE* on selected flights
*During Free User Trial period of two months to obtain Guests' feedback and improve onboard experience
*Supported chat apps: LINE, Whatsapp, WeChat
AirAsia

Step 2

Every time we want to use the jQuery library, we need to use its' namespace .

The obvious namespace is just jQuery,
But the shorter version is just the $ sign.

```
$("#test").hide()        jQuery("#test").hide()
```

Questions

Step 3

So…
How can we use it to make our vanilla tastier?

Selecting elements from the DOM

Step 3

Selectors and the jQuery Object

Step 3

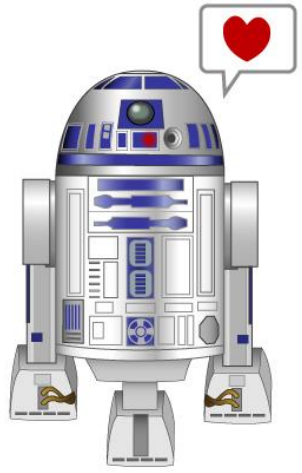
Selecting an element with the id of “control-panel” in JS

```
<body>
    <div id="control-panel"></div>
</body>
```

```
var controlPanel = document.getElementById("control-panel");
```

In jQuery

```
var controlPanel = $("#control-panel");
```



Step 3

What is the difference?

```
var controlPanel = document.getElementById("#control-panel");
var controlPanel = $("#control-panel");
```

- Shorter and more elegant
- jQuery selector function $ returns a jQuery object. Different than the object returned by getElementById

Step 3

There are more functions

But let’s look at some examples of selectors.

Step 3

Translate to English:

```
var controlPanel = $(".main.menu  #control-panel");
```

Element with id “**control-panel**” that is a descendant of an element with both “**main**” and “**menu**” classes

```
var listItems = $("ul li.list-item");
```

All elements with tag **li** and class **“list-item”** under element with tag **“ul”**

Wait… but that can return more than one element… More on that later, it is time for the next step!

Step 3

jQuery selectors can receive any CSS selector you know (and more)

```
var myFirstButton= $(".container button:first-child");

var flippedMemoryCards= $(".flipped.card:not(.disabled)");
```

Questions

Step 4

The many functions of a jQuery object

Step 4

So we have a jQuery object, what now?

```
var controlPanel = $("#control-panel");
```

Changing **one** CSS property

```
controlPanel.css("background-color","red");
```

Changing **many** CSS properties

```
controlPanel.css({
   "background-color":"red",
   "width":"100px",
   "display":"inline-block"
});
```

Step 4

Getting an attribute:

```
var panelId = controlPanel.attr("id");
```

Setting an attribute:

```
myImage.attr("src","./images/my_cat.jpg");
```

Actions on classes

- We can add, remove or toggle a class

```
// get all the elements with the class 'nice'.
var elms = $('.nice');

// add to all of them the class 'some-class'
elms.addClass('some-class');

// remove from all the class 'some-other-class'
elms.removeClass('some-other-class');

// remove the class open if it exists
// else, add "open"
elms.toggleClass('open');
```

Don’t worry.
Syntax is quiet weird, but you’ll get used to it soon.

Step 4

Clear HTML content:

```
controlPanel.empty();
```

Changing text content:

```
myTitle.text("Hello world");
```

Hiding an element (will set display to none):

```
controlPanel.hide();
```

Showing an element:

```
controlPanel.show();
```

Step 4

Fading in an element!

```
controlPanel.fadeIn();
```

Fading out an element!

```
controlPanel.fadeOut();
```

The full API (list of available functions)
Can be found in the jQuery website

Questions

Step 4

What happens when jQuery returns several results?
Consider the following HTML:

```
<ul id="my-menu">
  <li class="nav-option">Home</li>
  <li class="nav-option">About</li>
  <li class="nav-option">Gallery</li>
  <li class="nav-option">Contact Us</li>
</ul>
```

What will the following code do?

```
var listItems = $("#my-menu .nav-option");
listItems.hide();
```

Hide all of
the li elements

Step 4

Every result of the **$** query function is actually a collection (similar to array) of jQuery objects

```
var listItems = $("#my-menu .nav-option");
```

And as one it has the length property:

```
console.log(listItems.length);
```

Will print 4

Selectors Examples

Handling the DOM - the Jedi (jQuery) way

- Selectors Examples
- Get selectors by $ approach –

- $('input[type="text"]')
- $('input[disabled]')
- $('.divTableRow:even')
- $(".divTable .divTableRow .divTableCell:first-child")
- $('.divTableRow > div:nth-child(4)')
- $('[class^="cell"]')

New jQuery selector:

- $('button:first') - *Selects the first matched DOM element*

Same as $('button:eq(1)')

Step 5

Creating/removing elements

The easy way

Step 5

Creating an element using jQuery is super easy:

```
var navBar = $("<div/>");
navBar.addClass("nav-bar");
```

Just like JS we need to append it to the document

```
$("body").append(navBar);
```

Step 5

Let's create the following structure dynamically:

```
<ul id="my-menu">
  <li class="nav-option">Home</li>
  <li class="nav-option">About</li>
  <li class="nav-option">Gallery</li>
  <li class="nav-option">Contact Us</li>
</ul>
```

```
var menuOptions = ["Home","About","Gallery","Contact Us"];
var navBar = $("<ul/>");
navBar.attr("id","my-menu");
for (var i=0; i < menuOptions.length; i++){
        var myItem = $("<li/>");
        myItem.addClass("nav-option");
        myItem.text(menuOptions[i]);
        navBar.append(myItem);
}
$("body").append(navBar);
```

Step 5

Removing an element is also simple

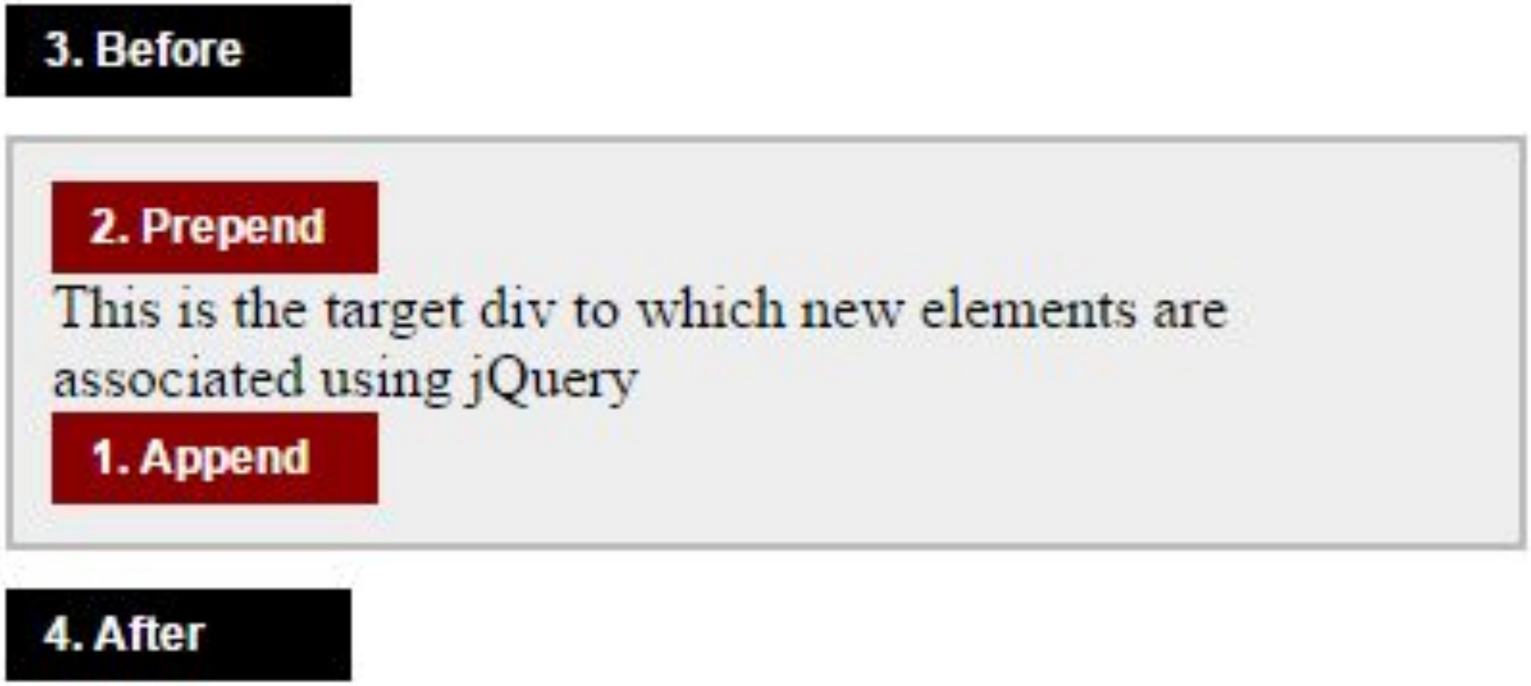
Remove an element with id “to-delete”

```
$("#to-delete").remove();
```

Creating elements

- append() - Inserts content **inside** the selected elements, at the **end**
- prepend() - Inserts content **inside** the selected elements, at the **beginning**
- after() - Inserts content **after** the selected elements
- before() - Inserts content **before** the selected elements

Creating Elements



3. Before

2. Prepend

This is the target div to which new elements are associated using jQuery

1. Append

4. After

Questions

Step 6

Selecting elements with context

Step 6

Sometimes we want to query elements within a specific parent

Let’s say we want all of the elements with class “to-delete” under a div with class “board2”

We have two options:

```
var elementsToRemove = $("div.board2 .to-delete");
```

OR

```
var board2 = $("div.board2");
var elementsToRemove = board2.find(".to-delete");
```

Performance

Whenever we are using a selector,
jQuery is querying the whole DOM
And it takes time

This is why this

```
var board2 = $("div.board2");
var changeColorTo  = board2.find(".colored");
var elementsToRemove = board2.find(".to-delete");
var replaceText = board2.find(".replace-me");
```

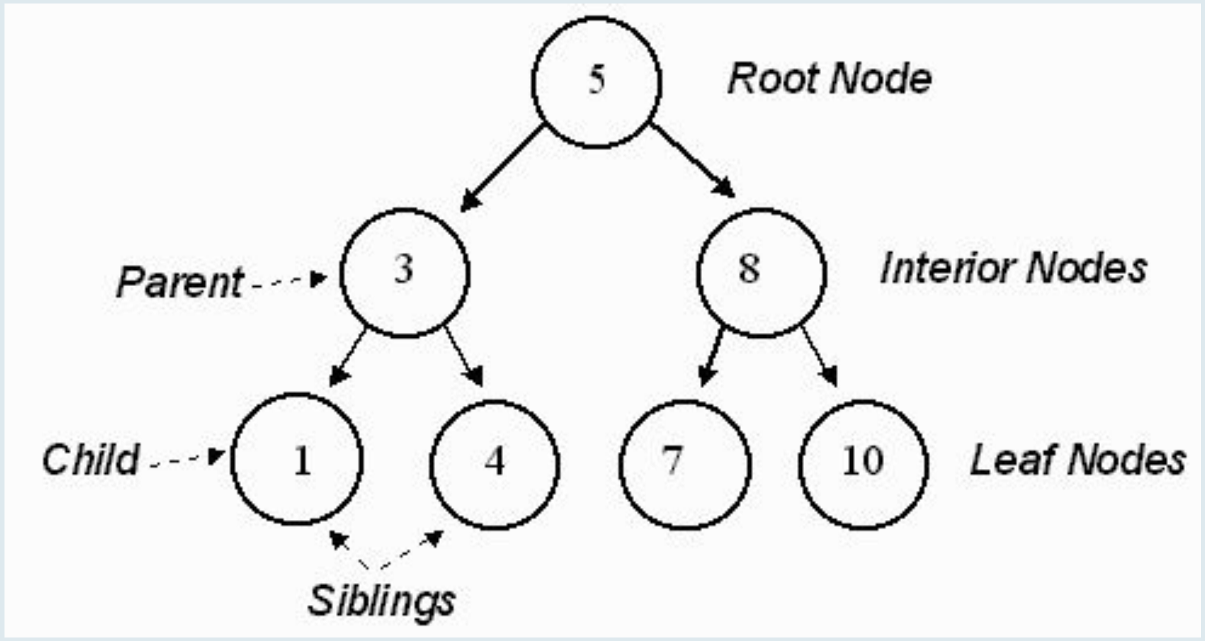
Is better than this:

```
$("div.board2 .colored");
$("div.board2 .to-delete");
$("div.board2 .replace-me");
```

Tree Data Structure

5 minutes of computer science theory

A tree is an abstract data structure.



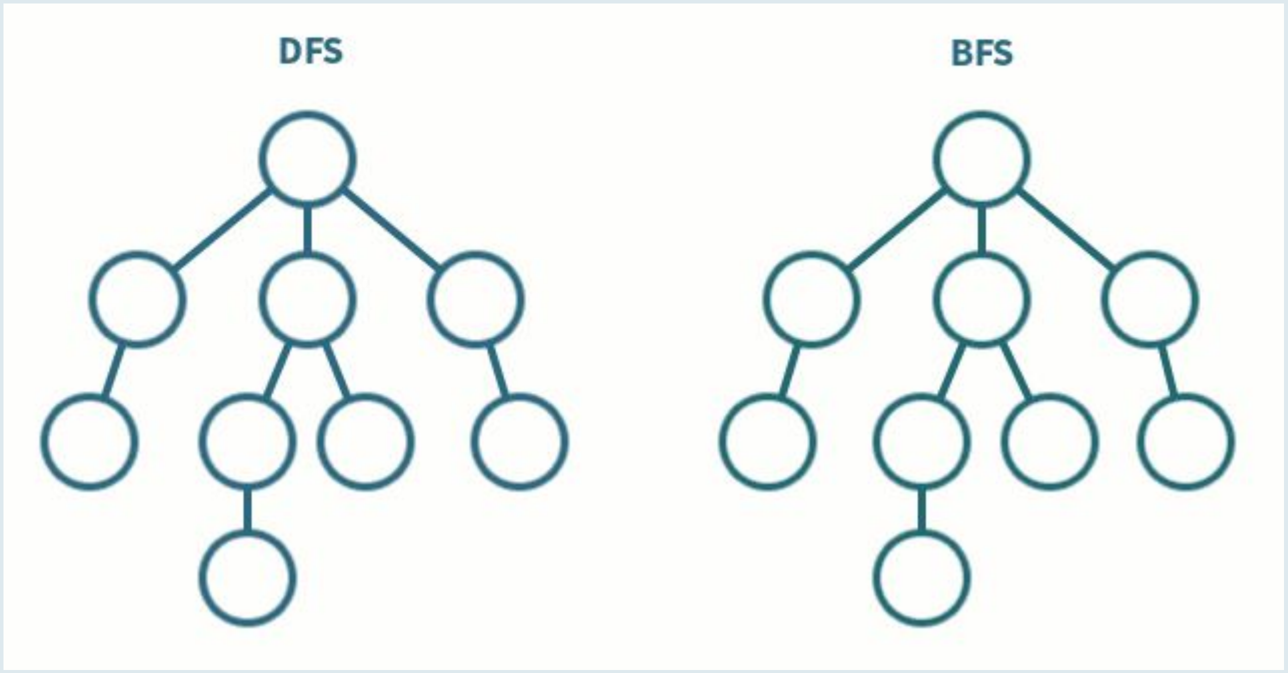
It has many implementations, for example – the DOM

Tree Traversal

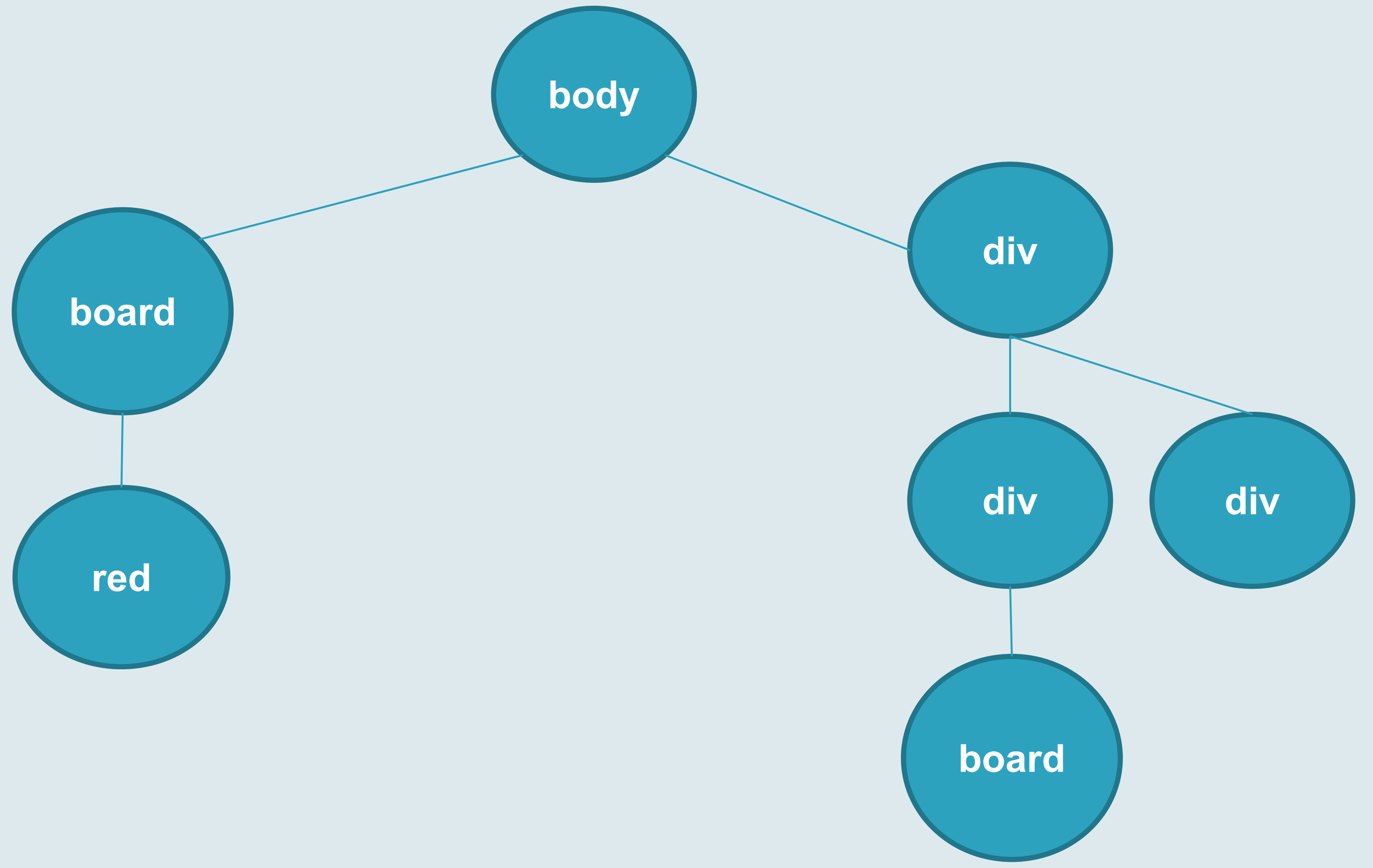
DFS vs BFS

DFS = depth first search (go deep)

BFS = breadth first search (go by circles)



DOM Traversal



```
var board = $(".board");
var btn = board.find(".red");
```

VS.

```
var board = $(".board");
var btn = $(".board .red");
```

Questions

Step 7

jQuery is forgiving

Step 7

An important fact about jQuery's forgiving nature

Consider the following HTML

```html
<ul id="menu">
   <li class="nav-option">Home</li>
   <li class="nav-option">About</li>
   <li class="nav-option">Gallery</li>
   <li class="nav-option">Contact Us</li>
</ul>
```

The following code Will not cause an error

```javascript
var hideMenuButtons = function () {
   var menu = $("#this-is-not-the-menu-id");
   menu.find("li.nav-option").hide();
};
```

Step 7

To know if the query returned results,
we can always use the following method:

```
var hideMenuButtons = function(){
    var menu = $("#this-is-not-the-menu-id");
    if (menu.length > 0){
        menu.find("li.nav-option").hide();
    }
};
```

Where should we put the js files?
If we put them in the head, this code from the previous steps (fixed) will not work:

```
var hideMenuButtons = function(){
    if (menu.length > 0){
        menu.find("li.nav-option").hide();
    }
};

hideMenuButtons();
```

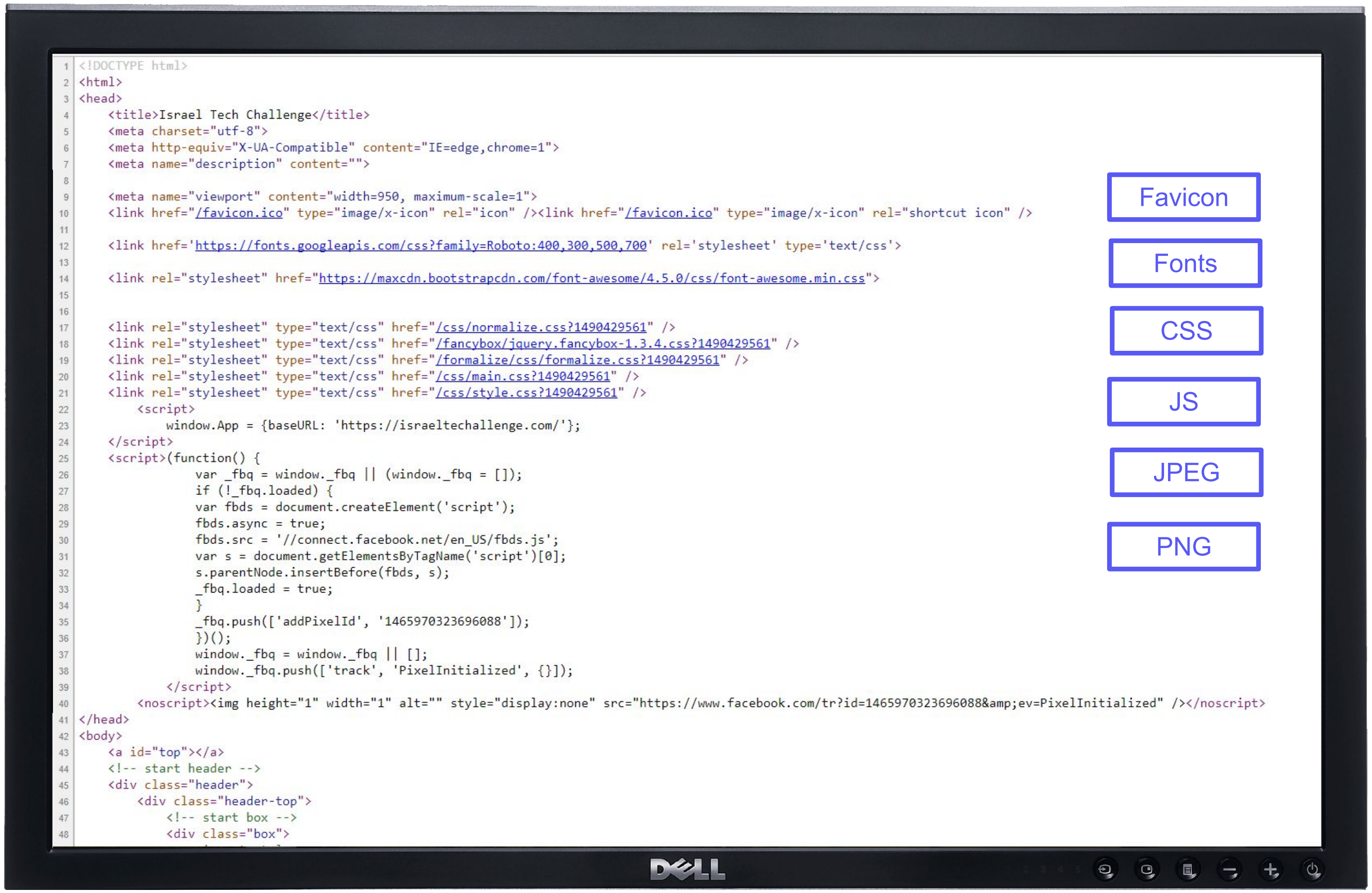
Why?

We need to wait for the browser to load
The DOM

Step 8

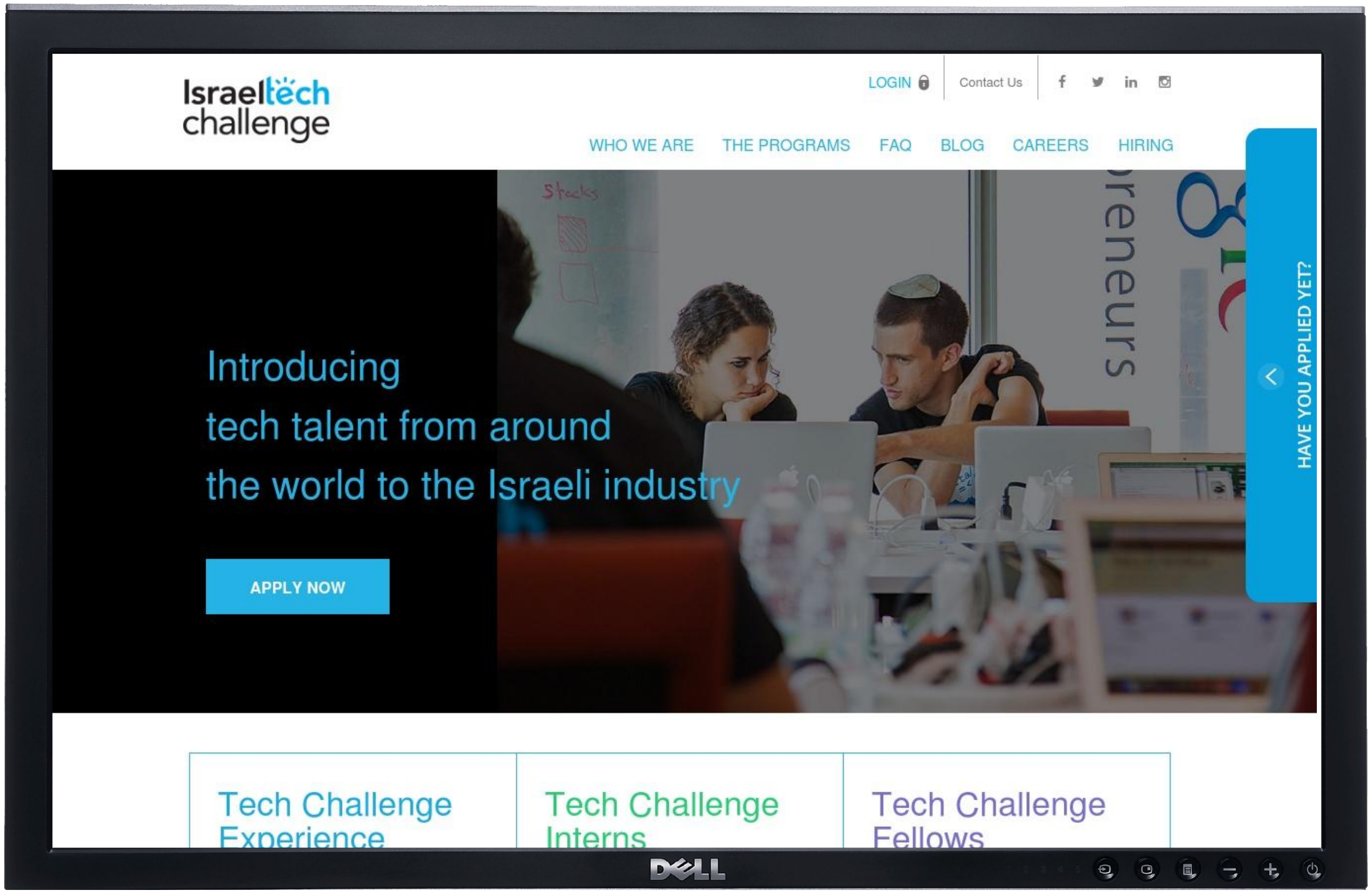
Waiting for the DOM to load

Loading a webpage requires resources



```
<!DOCTYPE html>
<html>
<head>
    <title>Israel Tech Challenge</title>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge,chrome=1">
    <meta name="description" content="">

    <meta name="viewport" content="width=950, maximum-scale=1">
    <link href="/favicon.ico" type="image/x-icon" rel="icon" /><link href="/favicon.ico" type="image/x-icon" rel="shortcut icon" />

    <link href='https://fonts.googleapis.com/css?family=Roboto:400,300,500,700' rel='stylesheet' type='text/css'>

    <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/font-awesome/4.5.0/css/font-awesome.min.css">


    <link rel="stylesheet" type="text/css" href="/css/normalize.css?1490429561" />
    <link rel="stylesheet" type="text/css" href="/fancybox/jquery.fancybox-1.3.4.css?1490429561" />
    <link rel="stylesheet" type="text/css" href="/formalize/css/formalize.css?1490429561" />
    <link rel="stylesheet" type="text/css" href="/css/main.css?1490429561" />
    <link rel="stylesheet" type="text/css" href="/css/style.css?1490429561" />
        <script>
            window.App = {baseURL: 'https://israeltechallenge.com/'};
    </script>
    <script>(function() {
                var _fbq = window._fbq || (window._fbq = []);
                if (!_fbq.loaded) {
                var fbds = document.createElement('script');
                fbds.async = true;
                fbds.src = '//connect.facebook.net/en_US/fbds.js';
                var s = document.getElementsByTagName('script')[0];
                s.parentNode.insertBefore(fbds, s);
                _fbq.loaded = true;
                }
                _fbq.push(['addPixelId', '1465970323696088']);
                })();
                window._fbq = window._fbq || [];
                window._fbq.push(['track', 'PixelInitialized', {}]);
            </script>
        <noscript><img height="1" width="1" alt="" style="display:none" src="https://www.facebook.com/tr?id=1465970323696088&amp;ev=PixelInitialized" /></noscript>
</head>
<body>
    <a id="top"></a>
    <!-- start header -->
    <div class="header">
        <div class="header-top">
            <!-- start box -->
            <div class="box">
```

Loading a webpage requires resources



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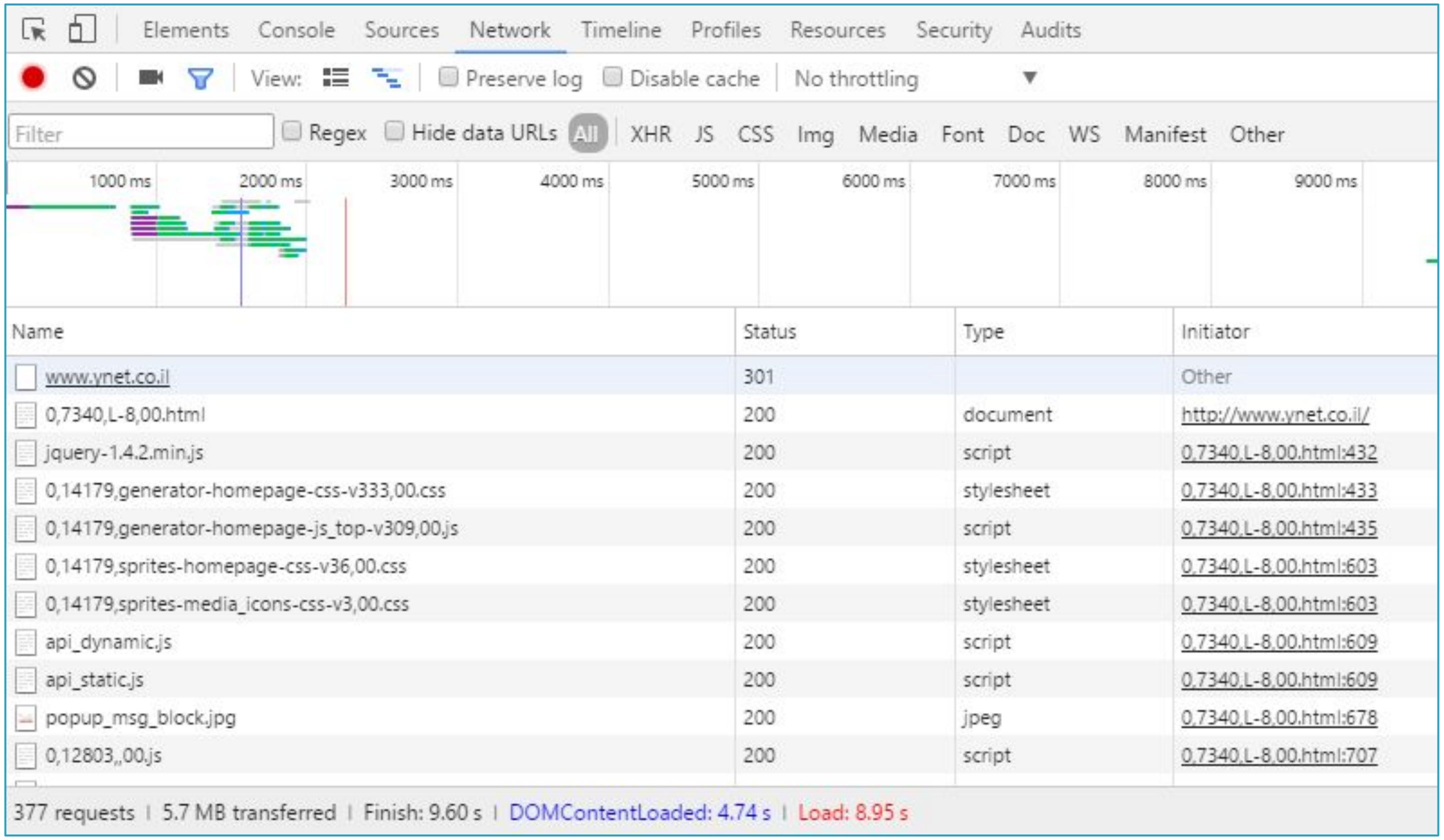
Tech Challenge Experience

Tech Challenge Interns

Tech Challenge Fellows

Loading resources

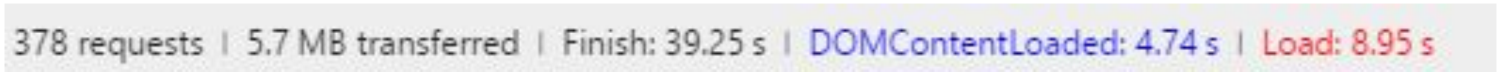
- Viewing the loaded resources is simple
- Use the **network** tab in the Chrome dev tools



Name	Status	Type	Initiator
www.ynet.co.il	301		Other
0,7340,L-8,00.html	200	document	http://www.ynet.co.il/
jquery-1.4.2.min.js	200	script	0,7340,L-8,00.html:432
0,14179,generator-homepage-css-v333,00.css	200	stylesheet	0,7340,L-8,00.html:433
0,14179,generator-homepage-js_top-v309,00.js	200	script	0,7340,L-8,00.html:435
0,14179,sprites-homepage-css-v36,00.css	200	stylesheet	0,7340,L-8,00.html:603
0,14179,sprites-media_icons-css-v3,00.css	200	stylesheet	0,7340,L-8,00.html:603
api_dynamic.js	200	script	0,7340,L-8,00.html:609
api_static.js	200	script	0,7340,L-8,00.html:609
popup_msg_block.jpg	200	jpeg	0,7340,L-8,00.html:678
0,12803,,00.js	200	script	0,7340,L-8,00.html:707

377 requests | 5.7 MB transferred | Finish: 9.60 s | DOMContentLoaded: 4.74 s | Load: 8.95 s

Notice the colors



378 requests | 5.7 MB transferred | Finish: 39.25 s | DOMContentLoaded: 4.74 s | Load: 8.95 s

- DOMContentLoaded – The DOM is loaded and parsed (the structure of the page), not including CSS, images, scripts etc.
- Load – the time when the images, videos and so on finished loading.

Document Ready

Let’s start with JS:

DOMContentLoaded

```
document.addEventListener("DOMContentLoaded", function(event){
    console.log("DOM fully loaded and parsed");
});
```

Load

```
document.addEventListener("load", function(event){
    console.log("All resources finished loading");
});
```

Why use $(document).ready?

- Loading a page takes an unknown time
- We want to make sure jQuery finds the right elements

```
$(document).ready(function(){
    // Document is loaded and DOM is ready
alert(“Document is ready”);
});
```

As we saw before, jQuery is a forgiving library.

When our code will execute:
- “menu” element is not ready yet and
- The selector will return nothing

In order to verify that the DOM has finished loading, we can use the “**ready**” function, which is equivalent to DOMContentLoaded .

DOMContentLoaded ~ ready (jQuery)

Load = load

Our code will now look like this:

```
var hideMenuButtons = function(){
        var menu = $("#menu");
        menu.find("li.nav-option").hide();
};

$(document).ready(function(){
    hideMenuButtons();
});
```

Using the actual document object and not a string

The ready function receives a function as a parameter (we chose to use an anonymous one)

Our code will execute only after the DOM has finished loading

Questions

Events

Agenda

- Chaining
- Events Listeners
  - Click()
  - Bind()
  - Blur()
  - Mouseenter()
  - DOMContentLoaded
  - Load
- A bit about data
- Iterating on child elements
- Chaining
- toggleClass
- On, Off (activating and disabling events)
- This, $(event.**target**)
- **$(this)**
- Event trigger
- each

Some inspiration

- Lets see what jQuery will allow us to do:

- jQuery UI Demo
- Magnifier Effect
- Bubble Navigation
- Circular Cool Things

Chaining

jQuery provides many functions for every element

- Add a class to it
- Add text to it
- Append it to the body

```
var someDiv = $("<div/>");
someDiv.addClass("big-div");
someDiv.text("someText");
someDiv.appendTo($(document.body));
```

Chaining

- Alternatively, we can do the same using function chaining
- Every function operates on the result of the previous functions in the chain.

```
$("<div/>")
    .addClass("big-div")
    .text("someText")
    .appendTo($(document.body));
```

Event listeners

- An asynchronous design pattern
- Allows us to catch an action or a change

- Catching events on the DOM:

 Click()
 Bind()
 Blur()
 Mouseenter()

Event listeners in jQuery

jQuery is far more elegant!

- jQuery

```
$(".new-game-btn").on('click', function(){
     MemoryGame.start(imgArr);
});
```

- Javascript – long an tedious…..

```
var newGameBtn = document.getElementsByClassName("new-game-btn");
for(var i=0;I < newGameBtn.length;i++){
//define event listeners for the click on the new game buttons
   newGameBtn[i].addEventListener('click',function () {
         MemoryGame.start(imgArr);
   });
}
```

Adding event listeners

- We can add any event listeners to any jQuery object:

```
var btn = $('.btn');
btn.on('click', function (eventObj) {
    var btnClicked = $(this);
    btnClicked.toggleClass("red-text");
});
```

- Another option is just use .click()

```
btn.click(function(eventObj) {
    var btnClicked = $(this);
    btnClicked.toggleClass("red-text");
});
```

Removing event listeners

- we can also remove listeners from any jQuery object

```
var btn = $('.btn-1');
btn.on('click', function (eventObj) {
    var btnClicked = $(this);
    btnClicked.off('click');
    btnClicked.toggleClass("red-text");
});
```

- Once the specific button is clicked once, it will not trigger the event again.

Questions

What triggers an event?

```
<div class="container-fluid">
    <div class="row first">
        Some text
    </div>
    <div class="row second">
        Some text
    </div>
</div>
```

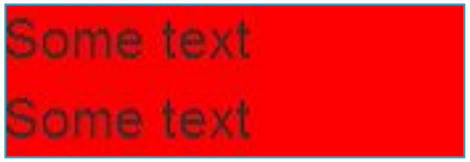
- Let’s add an event listener to the parent class

```
$('.container-fluid').on("mouseover mouseout", (function(event){
    $(this).toggleClass('red-bg');
}));
```

- This adds 2 event listeners to every jQuery element of class **container-fluid**

What triggers an event?

- What will happen if we move our mouse over a child element of `$('.container-fluid')`?

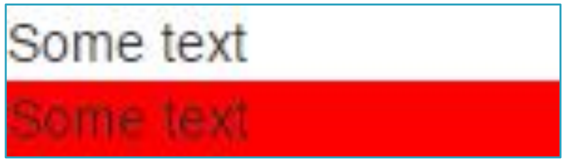


Some text

Some text

- What happens if we change `$(this)` to `$(event.target)` ?

```
$('.container-fluid').on("mouseover mouseout", (function(event){
    $(event.target).toggleClass('red-bg');
}));
```



Some text

Some text

Specifying an event target

```
<div id="test">
  <div class="can-click">can click</div>
  <div>can't click</div>
</div>
```

What if we want only one div to be clickable?

In jQuery we can specify a selector that will filter the descendants of the selected elements that can trigger the event.

```
$("#test").on("click", ".can-click", function(){
   console.log(this);
});
```

Triggering an event via code

```
$("#some-btn").click();
```

Select a specific element

Click on it

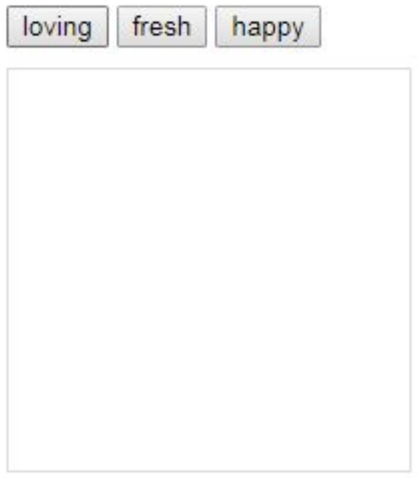
- What happens if there is no event listener defined on that element? Nothing!

Events

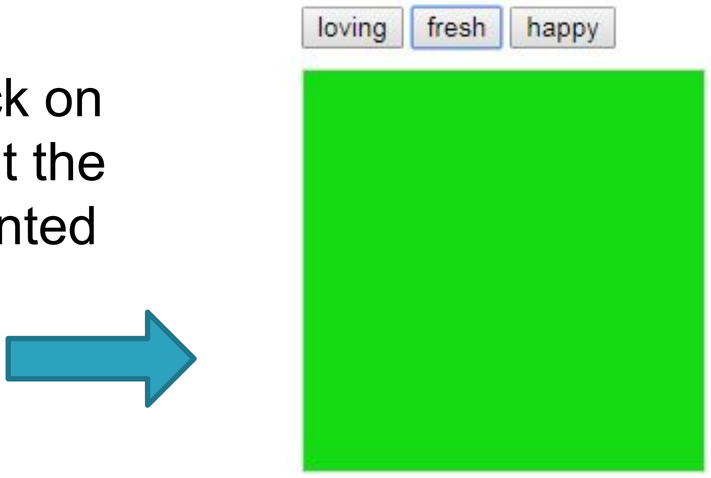
- The Full event list here (Online, like everything else 😊)
  - click
  - mousedown
  - mouseout
  - dblclick
  - blur
  - focus
  - keyup
  - keypress
  - Hover
  - …

Emotional coloring

We have button that will paint our box with different color according to the emotion.
Here is a mockup:



When we click on fresh we want the box to be painted green.



How can we do that?

Data elements

- We can add arbitrary data to the jQuery objects using .data()
- Setting data on jQuery elements:

```
$('.btn-1').data("dataname","value");
```

- Getting data from a jQuery element:

```
$('.btn-1').data("dataname");
```

This data will only exist in the jQuery object!

Emotional coloring

What we want to do is connect between a DOM element and a color.

Can you do it?
We can do that with the data feature:

```
$("button:nth-child(1)").data("color", "#e12e2e");
$("button:nth-child(2)").data("color", "#14db14");
$("button:nth-child(3)").data("color", "#fee11b");

$("button").click(function(){
  $(".result").css("background", $(this).data("color"));
});
```

Here is the code

Iterating over children

When we get multiple elements using a jQuery selector we can iterate them with the each function.

```
$('input').each(function () {
    console.log($(this).val());
});
```

This can be useful when you want to read value or data from multiple elements.

Questions

Further reading:

- https://api.jquery.com/category/traversing/
- https://learn.jquery.com/using-jquery-core/
- http://tutorialzine.com/2011/06/15-powerful-jquery-tips-and-tricks-for-developers/
- https://learn.jquery.com/performance/optimize-selectors/

Further reading:

- http://api.jquery.com/ documentation
- https://jqueryui.com/ good widgets.
- Compare between using jQuery and Javascript http://youmightnotneedjquery.com/ and http://vanilla-js.com/.
- http://lab.abhinayrathore.com/jquery-standards/ style and performance rules recommendations.

Live examples from the lecture

- Selectors examples
  http://jsfiddle.net/2bhere4u/h054Lkdn/17/

- DOM Manipulation examples
  http://jsfiddle.net/2bhere4u/nhoyyjx6/9/

- Document ready example
  http://jsfiddle.net/2bhere4u/om1aomf5/

Summary

- You needed to understand:

  - jQuery brings us many plugins to use
  - Code reuse is blessed
  - How chaining works
- You need to remember:

  - Everything is online
  - Wait for the DOM to be ready
  - jQuery is less verbose and reusable
- You need to be able to do:

  - Play with selectors – Queries
  - Create elements with jQuery
  - Use Event listeners in jQuery
  - Use chaining
  - Use Class toggle
  - Use each

<itc>

Jquery Cheat Sheet

Add Jquery in ascript tag

```
<script src="https://code.jquery.com/jquery-3.0.0.min.js"></script>
```

Selectors

```
$("#control-panel");
```

Change CSS

```
jqueryObject.css("background-color","red");
```

Add class

```
controlPanel.addClass("minified");
```

Remove class

```
controlPanel.removeClass(“mobile-mode");
```

Get Attribute

```
var panelId = controlPanel.attr("id");
```

Remove class

```
myImage.attr(“src",“./images/my_cat.jpg");
```

Clear HTML content

```
controlPanel.empty();
```

Change text content

```
myTitle.text(“Hello world");
```

Hide Element

```
controlPanel.hide();
```

Show Element

```
controlPanel.show();
```

Fadein animation

```
controlPanel.fadeIn();
```

Append

```
$("body").append(navBar);
```

Remove

```
$("#to-delete").remove();
```

Select under a specific node:

```
var board2 = $("div.board2");
var element = board2.find(".to-delete");
```

Remove

```
$(document).ready(function(){
    hideMenuButtons();
});
```

Jquery events Cheat Sheet

Toggle class

```
elms.toggleClass('open');
```

On (add event) + Off

```
btn.on('click', function (eventObj) {
    $(this).off('click');
});
```

Add Data

```
$('.btn-1').data("dataname","value");
```

Get Data

```
$('.btn-1').data("dataname");
```

Loop over elements

```
$('input').each(function () {
    console.log($(this).val());
});
```