

EECS 1012. LAB 04: HTML+CSS+JS

A. IMPORTANT REMINDERS

- 1) You must attend your assigned lab session (we will be marking your submission in the lab).
- 2) You must arrive on time: anyone later than 15 minutes may not be admitted to the lab.
- 3) You must complete the pre-lab mini quiz posted on Moodle in the first minutes of your lab time.
- 4) Each lab including the pre-lab mini quiz is about 2% of your overall grade.
- 5) TAs are in the lab to help you. They will also verify and mark your work at the end. Signal a TA for help if you stuck on any of the steps below. Yet, note that TAs would need to help other students too.

B. IMPORTANT PRE-LAB WORKS YOU NEED TO DO BEFORE GOING TO THE LAB

- 1) Download this lab files and read them carefully to the end.
- 2) You should have a good understanding of
 - Events (such as onclick, ondblclick)
 - `document.getElementById().innerHTML`
 - `document.getElementById().setAttribute()`
 - `document.getElementById().style`
 - `document.getElementById().style.display`

C. GOALS/OUTCOMES FOR LAB

- 1) To learn how to change the *behaviour* of an HTML document using JavaScript.

D. TASKS

Part 1: Start developing a learning kit that by end of term could include anywhere between 30 to 50 computational problems and solutions. Details are as follow.

- 1) You are provided a simple `myLearningKit.HTML` document and supporting files such as `myLearningKit.CSS` and `myLearningKit.js` as well some images. Your first task will be to improve the presentation of the HTML file slightly. Then, your major task is to improve the *behaviour* of the HTML file by providing JavaScript codes.
- 2) You will generate at least five sets of HTML and JS files in this process. You should demo each HTML file to the TA. For that, please, have each HTML file open in a different tab so you can show the progression.
- 3) See next pages for details on how to modify your HTML and JS files.

Part 2: Validate your HTML code using the <https://validator.w3.org> (upload your .html file)

- If you have errors, fix them and retry the validation until your HTML document is error free.

Part 3. Verification and submission of your work. See the following section.

E. SUBMISSIONS

- 1) Manual verification by a TA

You will need to have one of the TAs of your lab to verify your work before submission. The TA will look at your various files in their progression. The TA may ask you to make minor modifications to the lab to demonstrate your knowledge of the materials. The TA will mark your name off a list; You are required to sign the list to show your attendance and that you have been verified.

- 2) Moodle submission

You will see an assignment submission link on Moodle. Create a folder named "Lab04" with all your lab materials inside (image folder, `myLearningKit_Ex{1,2,3,4,5}.HTML` and `myLearningKit_Ex1.css`,

and myLearningKit_Ex{2,3,4,5}.js). This folder should be compressed (or tar.gz) and the compressed file submitted.

F. WEBPAGE CONTENT

STARTING POINT: **myLearningKit.html**, **myLearningKit.css**, **myLearningKit.js**, and images in the **image folder**. You are given the following HTML file.

My Computational Thinking Kit

Problem01 Problem02 Problem03 Problem04 Problem05 Problem06 Problem07 Problem08 Problem09 Problem10

☐ Design null
☐ JavaScript Solution null
☐ Another Solution null
(c) Author of this web page: your name here

This file is not connected to a CSS file. In Exercise 1, you improve the *presentation* of this HTML document by modifying the HTML and CSS files slightly.

Before proceeding further, open **myLearningKit.HTML** in VS Code and carefully learn about its content and structure.

Note that this document eventually is going to be an interface (in particular, a webpage) that contains some basic computational problems together with your flowcharts and implementations. However, it takes a few weeks until we get there. So, for now we (ab)use the document towards demonstrating foods.

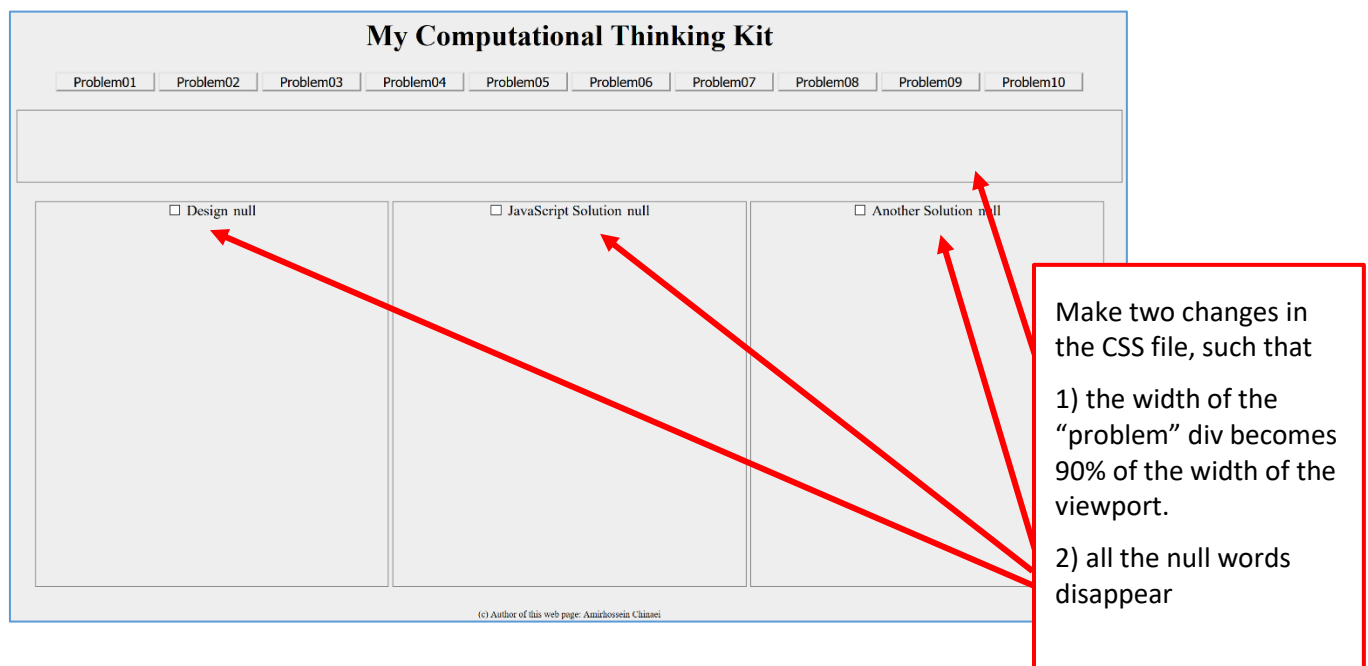
Exercise 1: (CREATE: **myLearningKit_Ex1.HTML** and **myLearningKit_Ex1.css**)

Copy **myLearningKit.HTML** to a new file named **myLearningKit_Ex1.html**. Copy **myLearningKit.CSS** to a new file named **myLearningKit_Ex1.css**.

Make two changes to **myLearningKit_Ex1.html**, as follows:

- 1) Connect it to **myLearningKit_Ex1.CSS** by adding a link tag in the head element.
- 2) In the footer element, replace “your name here” with your name.

When you open your HTML file with browser, you should see the following result:



Now, as stated in the red box above, make two changes to **myLearningKit_Ex1.css** as follows. Currently, the width of the “problem” division is 100% of its parent (which is the body element). We want to have the width of the “problem” division set to 90% of the width of the viewport. Find it in w3schools how we can use width of viewport.

Side note. Make sure you get used to find help directly in w3schools (and not from other websites or search engines). Why? Because in the lab-tests, you may have access to w3schools but not to anything else.

Also, as you can see in the HTML file, the source file of the images as well as the alt attributes are all set to *null*. In other words, we do not want yet these img tags to display anything. But, in the picture above, the word “null” is displayed. If, in the HTML file, we remove the attributes src and alt from the images, our HTML code is no longer valid. Hence, we need to make a change in the CSS file such that these images do not display anything for now. After making these two changes in the CSS file, you should have the following result:



Recall: you should figure out how to make such changes by yourself for instance in w3schools (or, by some quick searches in the web). Asking for help from your friends or from TAs should be a last resort.

Optional: you may want to change the colouring and borders of some of the elements above to make your kit page more appealing. We do not grade it though.

Exercise 2: (CREATE: **myLearningKit_ex2.html** and **myLearningKit_Ex2.js**)

Copy **myLearningKit_Ex1.html** to a new file named **myLearningKit_Ex2.html**. Copy **myLearningKit.js** to a new file named **myLearningKit_Ex2.js**.

When you open the **myLearningKit_Ex2.html** in your browser, if you click on any of the buttons, nothing happens. In other words, we have not defined any behaviour for our page yet. Let’s do it step by step.

- 1) Add an attribute `onclick` to the button designated for Problem01 such that when clicked function `p01Func` is called.

```
onclick="p01Func()"
```

- 2) The body of `p01Func()` can be provided in the HTML file internally. In particular, we can add a script element and write our JavaScript code inside it. But, similar to what we do for CSS, we encourage you to have your JavaScript code in an external file. To do so, add the following line to your HTML file:

```
<script src="myLearningKit_Ex2.js"></script>
```

- 3) Open **myLearningKit_Ex2.js**. We already provided you with the skeleton of `p01Func()`.

```
Function p01Func(){
...
}
```

The body of the function is what we write in the pair of curly braces. We want to update the content of the “problem” division with the following paragraph:

I'm looking for a type of pancake originating from the Indian subcontinent, made from a fermented batter. It is somewhat similar to a crepe in appearance.

To do so, we need to get from our HTML file the element that its ID is “problem”, by the following JavaScript code:

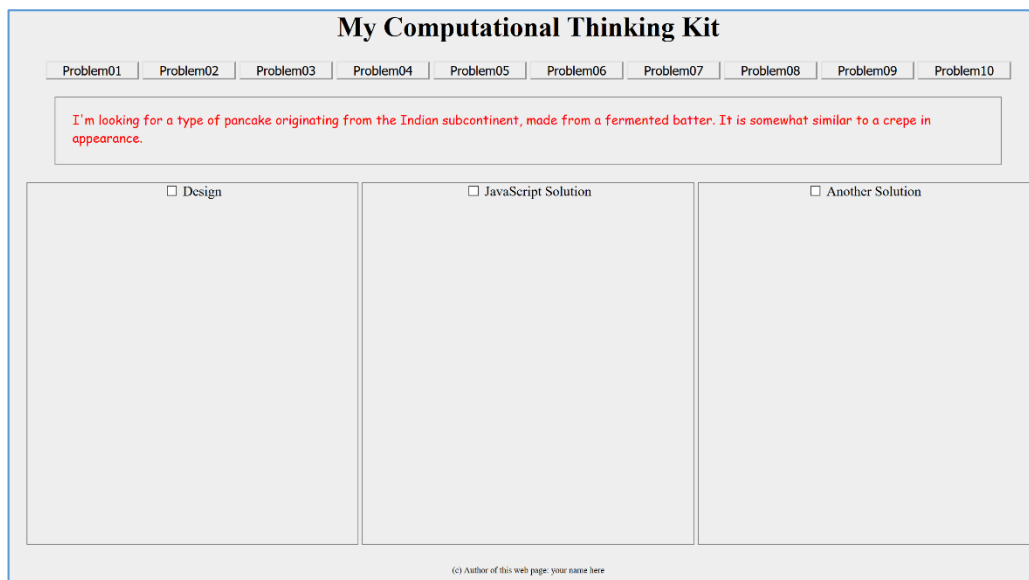
```
document.getElementById("problem")
```

This would get us a construct, that we know it as an **object**.

Then, we need to assign the paragraph above to the innerHTML of this object. Here, it’s the JavaScript code:

```
document.getElementById("problem").innerHTML="<p>...</p>";
```

where ... is replaced with the red paragraph above. Now, when you click on the button representing Problem01, you should see the following result.



4) At this point, you may want to revisit the **myLearningKit_Ex2.html** file and look up the `img` elements and their IDs. The idea is that for Problem01, `dosaDesign.jpg` is assigned to the image that its ID is “flowchart” and `dosa1.jpg` is assigned to the image that its ID is “js”.

So, you need to add more JavaScript code to what you did in Step 3. When you get an element by its ID, you can set any of its attributes by using `setAttribute()`. Since we want to set the `src` attribute of the element with ID “flowchart” to `dosaDesign.jpg`, we need to add the following code:

```
document.getElementById("flowchart").setAttribute("src","images/dosa/dosaDesign.jpg");
```

Because we do not want to display the image yet, we need to set the display property of its style to none.

Similar to above, assign `dosa1.jpg` to `src` of the element that its ID is `"js"` and set its display to none. (You may want to download another image for dosa from internet (save it as `dosa2.jpg`) and assign it to the element that its ID is `"another"` and set its display to none.)

Note that the images are still not displayed. We will display them in the next exercise.

Exercise 3: (CREATE: `myLearningKit_Ex3.html` and `myLearningKit_Ex3.js`)

Copy `myLearningKit_Ex2.html` to a new file named `myLearningKit_Ex3.html`. Copy `myLearningKit_Ex2.js` to a new file named `myLearningKit_Ex3.js`.

The idea is to modify the new files such that when we check/uncheck the checkboxes by clicking on them, the images display/disappear, respectively.

- 1) First, we need to add the `onclick` event to checkbox `"check1"` in `myLearningKit_Ex3.HTML`. This is similar to what you did in Step 1 of Exercise 2 for buttons. When this checkbox is clicked, we want to call a function that we name it `checkUncheck1()`.

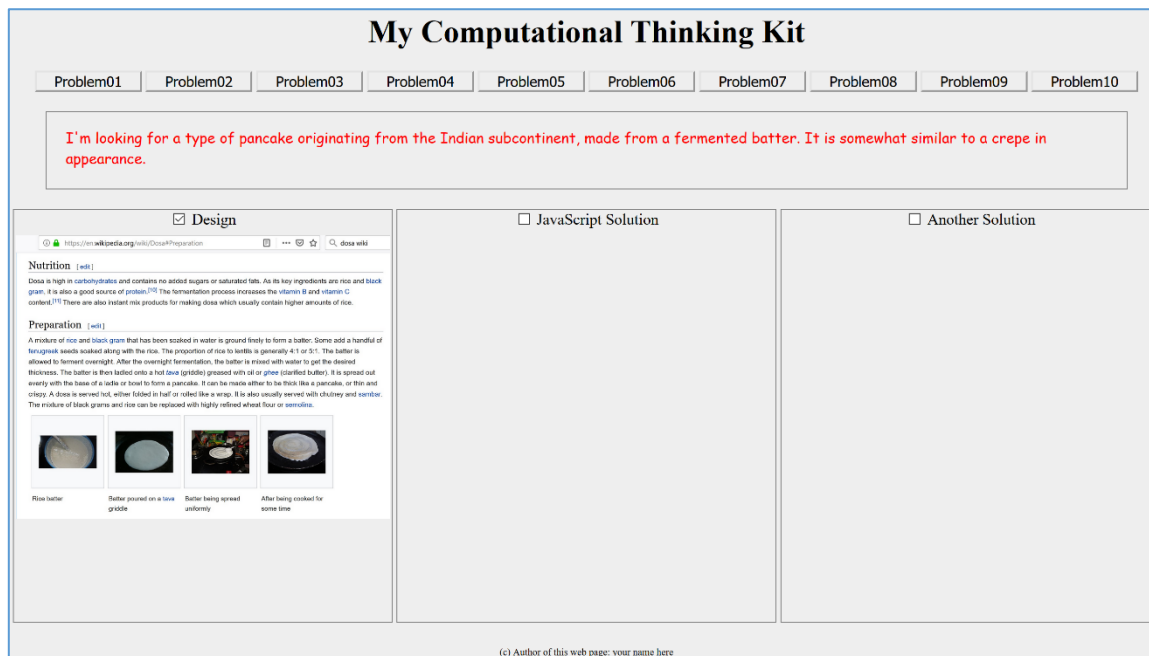
```
onclick="checkUncheck1()"
```

- 2) Then, we want to provide the function in `myLearningKit_Ex3.js`. Remove the two lines that we ask you to remove in the `js` file to uncomment `checkUncheck1()`. Then add each of the following two commands where appropriate.

```
document.getElementById("flowchart").style.display="inline";  
document.getElementById("flowchart").style.display="none";
```

The `if` statement there determines if the image is displayed or not; if not, we display it. If yes, we disappear it. In other words, by clicking on the Design checkbox, the image's display toggles.

The following picture shows when the Design checkbox is checked.



- 3) Mimic steps 2 and 3 above for toggling the image that is displayed in the next checkbox.

The following picture shows when the next checkbox is checked too.

My Computational Thinking Kit

Problem01 Problem02 Problem03 Problem04 Problem05 Problem06 Problem07 Problem08 Problem09 Problem10

I'm looking for a type of pancake originating from the Indian subcontinent, made from a fermented batter. It is somewhat similar to a crepe in appearance.





☒ Design

Nutrition [edit]

Dosa is high in carbohydrates and contains no added sugars or saturated fats. As its key ingredients are rice and black gram, it is also a good source of protein.^[1] The fermentation process increases the vitamin B and vitamin C content.^[1] There are also instant mix products for making dosa which usually contain higher amounts of rice.


Preparation [edit]

A mixture of rice and black gram that has been soaked in water is ground finely to form a batter. Some add a handful of fenugreek seeds soaked along with the rice. The proportion of rice to lentils is generally 4:1 or 5:1. The batter is allowed to ferment overnight. After the overnight fermentation, the batter is mixed with water to get the desired thickness. The batter is then ladled onto a hot steel griddle greased with oil or ghee (clarified butter). It is spread out evenly with the base of a ladle or bowl to form a pancake. It can be made either to be thick like a paratha, or thin and crispy. A dosa is served hot, either folded in half or rolled like a wrap. It is also usually served with chutney and sambhar. The texture of black gram and rice can be replaced with highly refined wheat flour or sorghum.

Rice batter
Batter poured on a hot griddle
Batter being spread uniformly
After being cooked for some time

☒ JavaScript Solution



☐ Another Solution

(c) Author of this web page: your name here

Exercise 4: (CREATE: **myLearningKit_Ex4.html** and **myLearningKit_Ex4.js**)

Copy **myLearningKit_Ex3.html** to a new file named **myLearningKit_Ex4.html**. Copy **myLearningKit_Ex3.js** to a new file named **myLearningKit_Ex4.js**.

Mimic what you did in Exercise 2, to assign problem description and corresponding images when button Problem02 is clicked. Add function p02Func() to the js file. Its body is similar to that of p01Func(). The innerHTML, of the object we get, will have the following paragraph.

I'm looking for an Iranian dish that consists of grilled chunks of chicken which are sometimes with bone and other times without bone. It'ss one of the most popular dishes of Iran. It is common to marinate the chunks in minced onion, lemon juice and sometimes saffron.

The images that you assign are jukehDesign.jpg, jukeh1.jpg, and jukeh2.jpg. Note that during this exercise, you are required to work on check3 as well (no matter if you did it during Step 4 of Exercise 2 or not). The following picture illustrates when Problem02 is clicked and all checkboxes are checked.

My Computational Thinking Kit

Problem01 Problem02 Problem03 Problem04 Problem05 Problem06 Problem07 Problem08 Problem09 Problem10

I'm looking for an Iranian dish that consists of grilled chunks of chicken which are sometimes with bone and other times without bone. It'ss one of the most popular dishes of Iran. It is common to marinate the chunks in minced onion, lemon juice and sometimes saffron.

☒ Design

Chicken (Jajeh) Recipe

INSTRUCTIONS


For the chicken:

- In a large bowl, combine half the saffron water and the lime juice, olive oil, onions, garlic, brinjal, chickpeas, salt, and pepper. Beat well with a fork. Add the pieces of Chicken (not the chicken and bone) and marinate. Cover and marinate for at least 8 hours and up to 2 days in the refrigerator. Taste the chicken twice during this period.
- Soak a bowl of vermicelli 30 minutes before you want to cook and let it drain until the liquid has drained. You can use a non-stick pan to speed up the process. Otherwise, preheat the oven broiler.
- Season the tomatoes.
- Spread wings, breasts, and legs onto different skewers (they require different cooking times).


For the basmati:

- Add the piece of 1 rice and the remaining saffron water to the melted butter. Add 1/2 teaspoon salt and 1/2 teaspoon pepper. Mix well and set aside.
- Place the basmati and chicken with the heating mixture. Cook the chicken and tomatoes 8 to 10 minutes, and done. Turn frequently and baste occasionally. The chicken is done when the juice that runs out is yellow rather than pink.


To serve:

- Spread a whole  spread on a serving platter. Place the chicken with the basmati mixture. Remove

☒ JavaScript Solution



☒ Another Solution



(c) Author of this web page: your name here

Exercise 5: (CREATE: myLearningKit_Ex5.html and myLearningKit_Ex5.js)

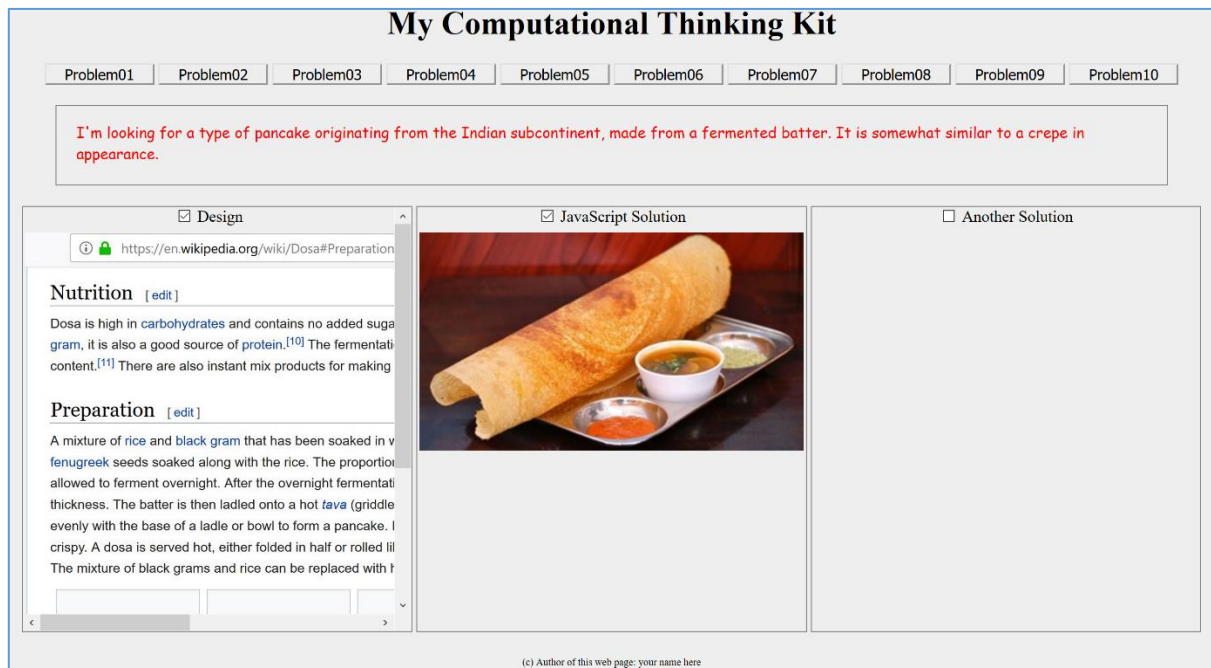
Copy **myLearningKit_Ex4.html** to a new file named **myLearningKit_Ex5.html**. Copy **myLearningKit_Ex4.js** to a new file named **myLearningKit_Ex5.js**.

In this exercise, we want to add two more functions to our JavaScript code. One we call it `zoomIn()` and the other `zoomOut()`. The objective is that when the image of the first checkbox is double clicked, we want to make its width 200% (do this in the body of `zoomIn()`) and when is single clicked, we want to have its original width of 100% (we do this in the body of `zoomOut()`).

Here, it's list of what you need to do:

- 1) In your HTML file, add `onclick` and `ondblclick` attributes to the image that its ID is "flowchart"
 - a. on an `ondblclick` event, function `zoomIn()` is called
 - b. on an `onclick` event, function `zoomOut()` is called
- 2) In your js file, add `zoomIn()` and `zoomOut()` functions
 - a. write `document.getElementById("flowchart").style.width="200%";` in the body of `zoomIn()`
 - b. write a similar line in the body of `zoomOut()` to change the width to its original size

The following figure illustrates when Problem01 is clicked and the Design image is double clicked.



Exercise 6 optional further practice:

You may want to continue this project and add at least two more problems (or food definition) and corresponding design (or recipe) and implementations (or result pictures) for further practice.

Note. In order for the project to work properly all problems should have 3 images, one for design, one for js solution, and the 3rd for "another solution".

G. AFTER-LAB WORKS (THIS PART WILL NOT BE GRADED)

In order to review what you have learned in this lab as well as expanding your skills further, we recommend the following questions and extra practices:

Short answer questions:

- 1) How many functions are defined in your **myLearningKit_Ex5.js**?
- 2) How many function calls are in your **myLearningKit_Ex5.html**?
- 3) How many different types of events you handled in your **myLearningKit_Ex5.html**?
- 4) For which element(s) in your **myLearningKit_Ex5.html** you defined two events?
- 5) How can you see your JavaScript errors in Firefox?

To master your skills further,

- 6) Create a web page with text of your choosing (a single paragraph will do), which upon the mouse being positioned over it causes the same text to be repeated below the paragraph. When the mouse is no longer positioned over the text the copy of the text remains.
- 7) Same as 6 but when the mouse is no longer over the text the copy of the text disappears.
- 8) Create a web page with two paragraphs of text of your choosing, and with a button below the text. Clicking on the button should cause a solid border to appear around the first paragraph and a dashed border to appear around the second paragraph
- 9) Create a web page with two paragraphs of text of your choosing, and with a button below the text. Clicking on the button should cause a new paragraph to appear below the button containing the combined text of both paragraphs above the button.

Please feel free to discuss any of these questions in the course forum or see the TAs and/or Instructors for help.