Software Exercise 4
Practice Week #11
DOM and Canvas

Problem #1 (10 points). Practice the examples in the lecture note.

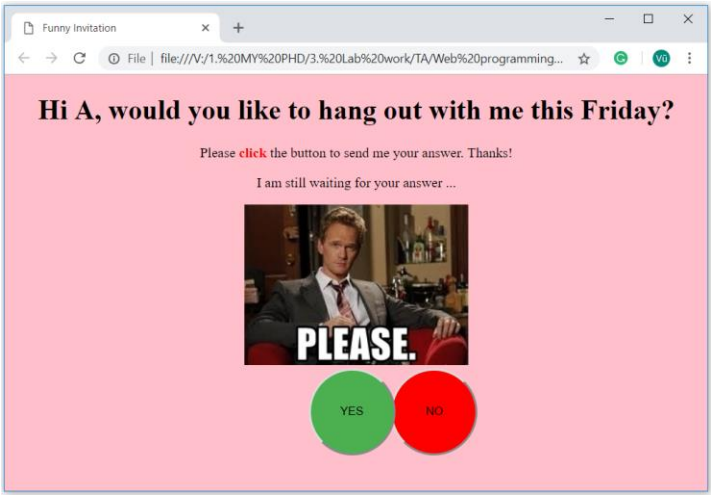
Follow the instructions in the lecture note and submit source codes and snapshots of results with HTML files. (p10, p25, p35, p38, p43, p48, p49, p52).

Problem #2 (30 points). Funny Invitation

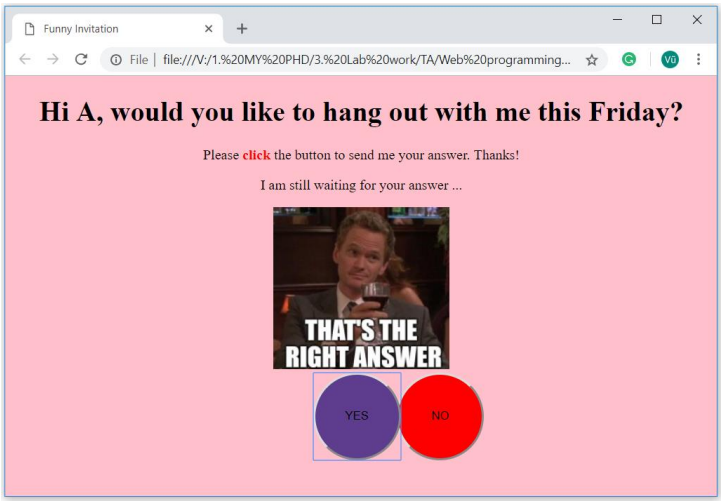
Submission: All codes that you wrote (HTML + JS file + CSS file (if you have)).

Description

In this problem, you will create a funny invitation page used to ask your girlfriend/boyfriend to hang out with you. Below is a sample of the HTML page (create yourself).



Before moving the pointer to the 'NO' button



After moving the pointer to the 'NO' button

Besides, you also need to create a javascript file to handle the event from the button on the page. In details, if your friend moves their pointer to the 'NO' button, the 'NO' button will randomly move to another place on the page. That is, only the 'YES' button can be clicked.

Hint

Q: **Which part of the lecture can I apply to this problem?**

A: The DOM part (chapter 10) of the lecture.

Q: **How to position an object?**

A: Use `object.style.top = '30px'` and `object.style.left = '30px'` is an example.

Q: **How to generate a random number?**

A: Use `Math.random()`. Note that this function generates uniform random number between 0 and 1. Thus, if you want to get a larger number, multiply the number you got with a large number is a possible solution.

Q: **What is the event handler for knowing a pointer is entering the object?**

A: Use '`mouseenter`' for the `addEventListener`.

Problem #3 (30 points). Meme Generation

What is meme?

According to Wikipedia, a meme is an idea, behavior, or style that spreads from person to person within a culture. The purpose of memes is to express a particular phenomenon, theme, or meaning.

Examples of memes

Regularly, a meme contains two parts: images and texts. Sometimes, you might see memes containing only images or only texts.

Submission

(HTML + JS file + CSS file (if you have)).

Your generated meme.

Description

In this problem, we focus only on memes that contain both images and texts. You need to create a web page that offers a frame to generate a specific type of meme (search types of memes on the Internet and select the best one you like).

You can also refer to the example I show below.

An example of meme generator

Hint

Q: **Which part of the lecture can I apply to this problem?**

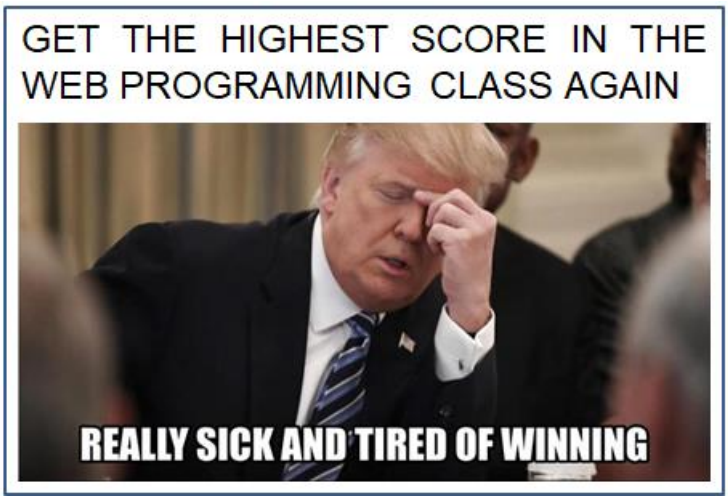
A: The Canvas part (chapter 11) of the lecture.

Q: **Do I need to make the exact meme (or the exact meme page) as the sample?**

A: No, you can surf the Internet, find any kind of memes that you like and create a page to generate that meme.

Q: **Do I need to create my own meme (i.e., a meme has never been existed before)?**

A: The requirement of this practice problem is to create the page that provides a frame to generate a kind of meme, not to create meme. If you satisfy the requirement, you get full score. However, you can think of a meme yourself.



GOOD LUCK WITH YOUR MEME!

Problem #4 (30 points). Simple Game

Submission

All codes that you wrote (HTML + JS file + CSS file (if you have)).

Description

In this problem, you need to create simple web game page. It is not a whole game but just a small part. In which, you make the character performs their skill by clicking on a button.

Below are the sample of the page that you will create.

At first, when you load your code, a web page is shown like Figure 1. After you press the button “Skill”, the page is shown like Figure 2.

Requirement

In this exercise, you use **DOM, Canvas** to make the web page.

Build a web page like the Figure 1:

- **Background**: Pink, Yellow, Pink
- **Texts and Images**: center
- **Button**: Round-button with color ‘green’, hover: color ‘white’
- **Image sprite**: Using canvas,
    - On the canvas, load the image sprite on a window with the width = 150 and height = 128 (to show only one image of the sprite on the page)
    - The method to load the image is drawImage(img, mover, 0, 150, 128, 0, 0, c.width, c.height)

- Continue updating the image by clearing the frame and then shifting the showing window to the right 150 units.

Below is an illustrating sample:

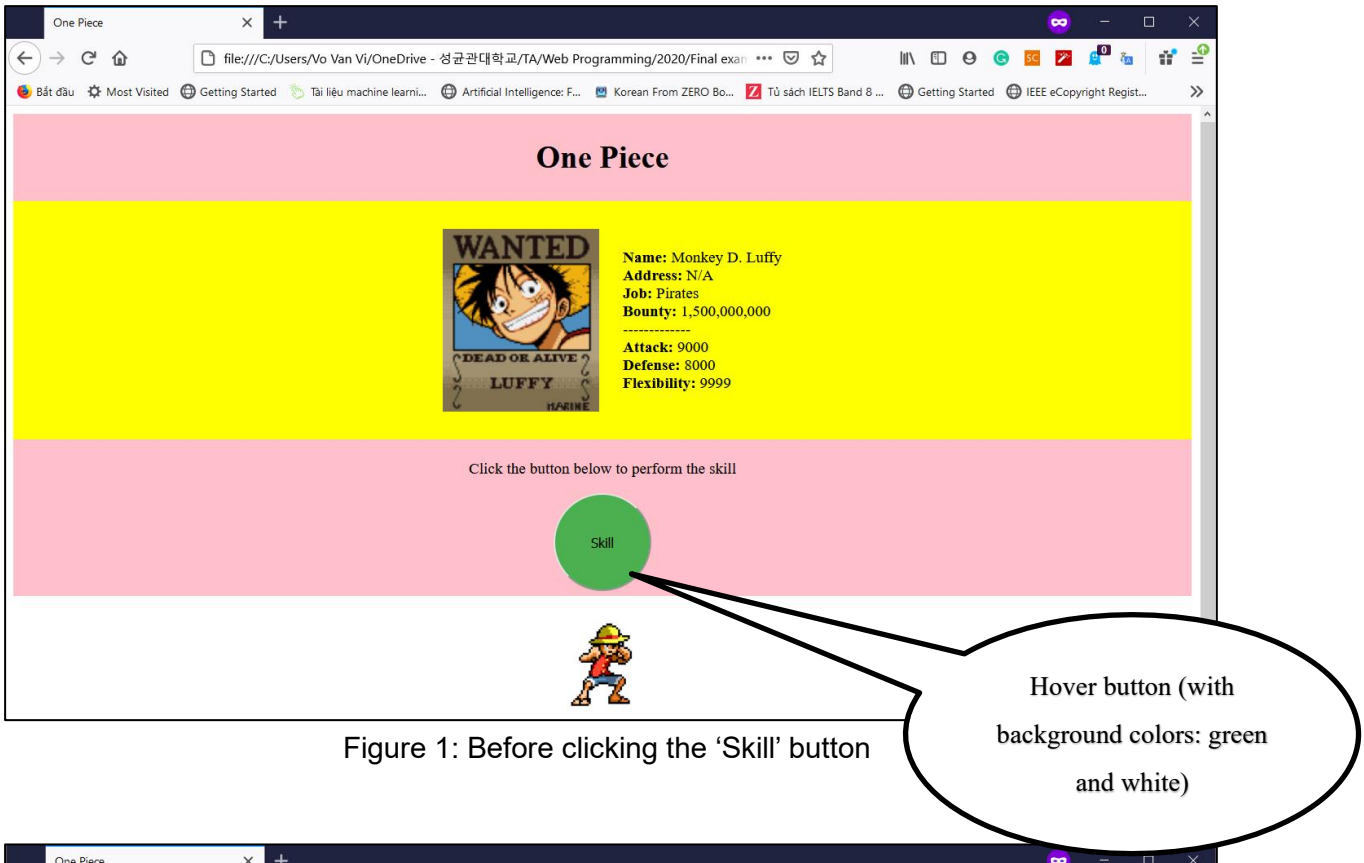


Figure 1: Before clicking the 'Skill' button

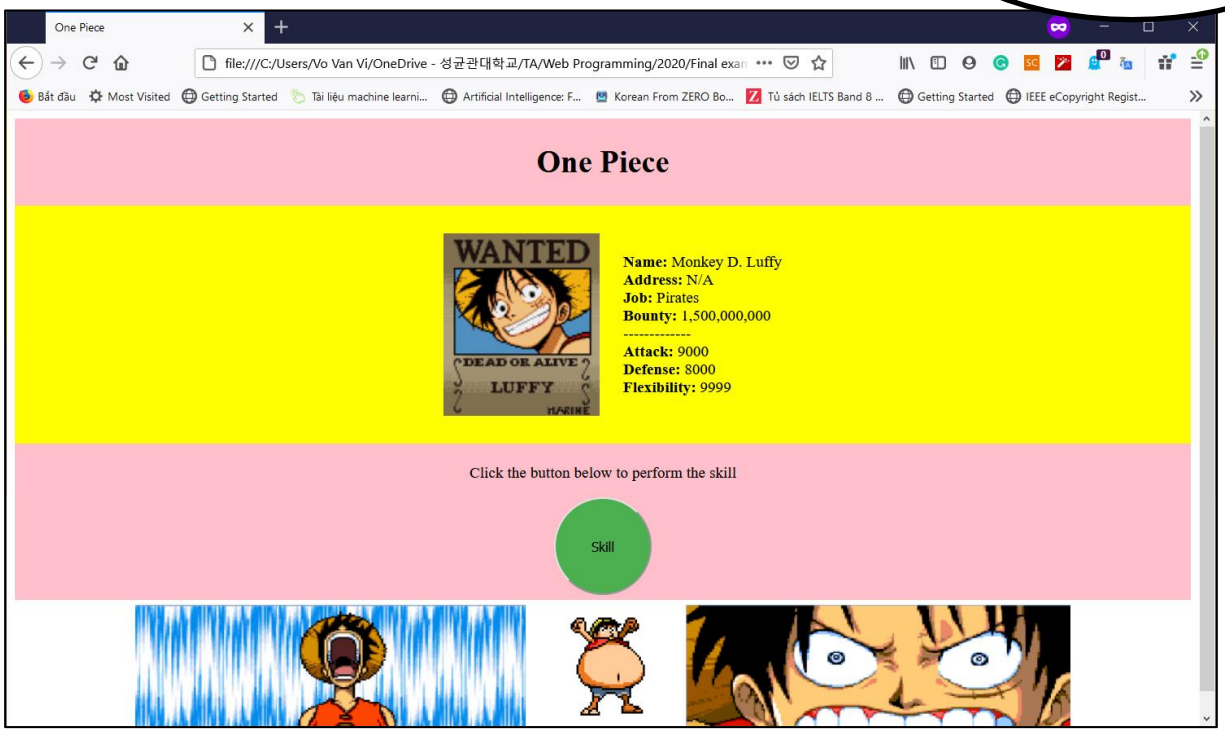


Figure 2: After clicking the 'Skill' button

Hint

Q: **Which part of the lecture can I apply to this problem?**

A: Both DOM and Canvas parts.

Q: **Can I use other image sprites?**

A: Yes, you can. However, you need to find out the size of the updated window, which could waste a lot of time on you.

Submission Guidelines

- A compressed file named W11_ID_NAME.zip via icampus
  - For each problem, create a folder named Problem#, and put the corresponding file(s) into the folder.
- Grading policies:
  - Your comments (if any) must be written in ENGLISH.
  - Clean code, good commenting are important components of your grade.