Web Programming: 2nd Computer-Based Test

注意事項：

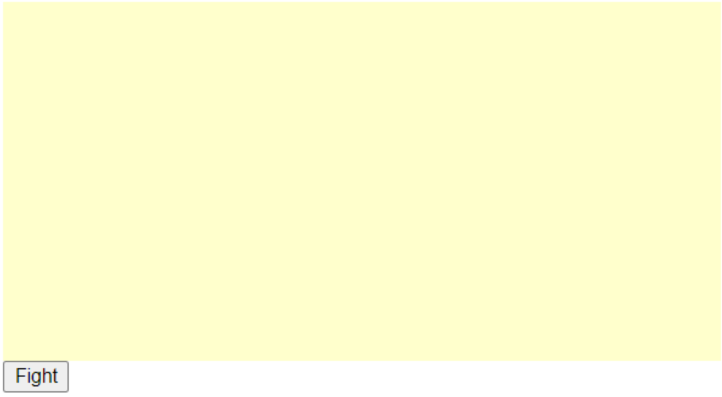
(1) 請將你的前六題解答之 html 檔案分別命名為[你的學號-1.html]、[你的學號-2.html]…，以此類推。例如：學號 66666666 的同學要在助教指定的位置創建一個 66666666 的目錄，而目錄中應包含 66666666-1.html, 66666666-2.html, …等 6 個檔案 (請將 HTML、JavaScript 與 CSS 寫在同一個檔案，不要分成三個檔案)。請持續留意檔案是否有儲存成功。

(2) 第七題請不要忘記了寫，請存成[你的學號-7.txt]，一樣放在你的學號的目錄下。

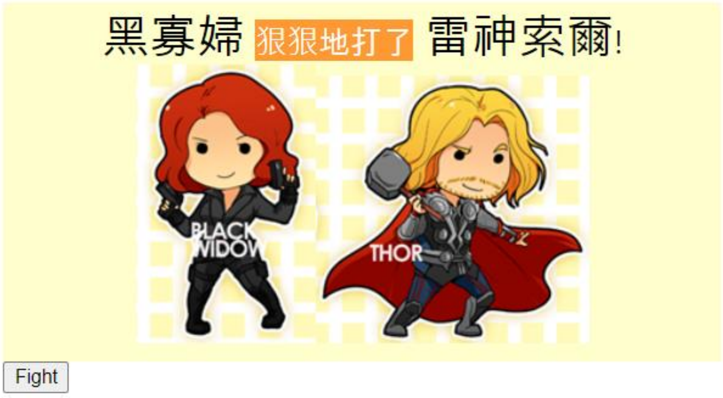
(3) 總分為 140，最高可得 105 分 (請自行斟酌選題，不需全部作答)

1. (20%) Please develop a short story generator about “The Avengers” as follows:

Initial UI:



Click the “Fight” button:

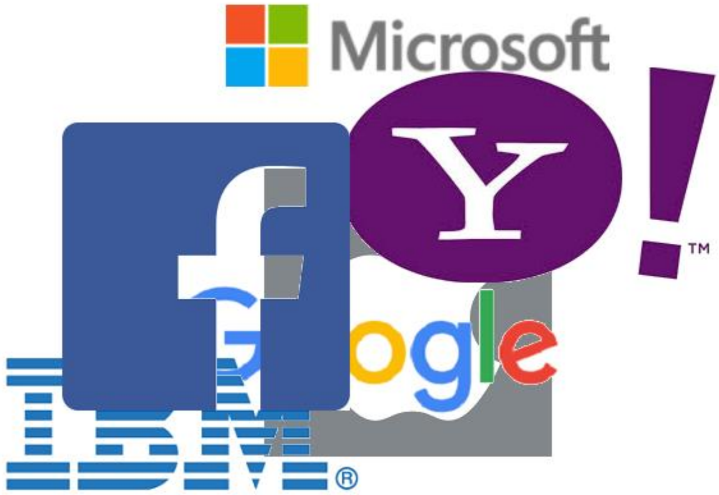

黑寡婦 狠狠地打了 雷神索爾!

- For the basic CSS, please refer to test-1-partial.html.
- To create sentences, you should use the arrays (roles and verbs) converted from the following two strings (do not modify the content of the strings):
  "鋼鐵人 美國隊長 雷神索爾 綠巨人浩克 黑寡婦 洛基 鷹眼"
  "狠狠地打了 想暗殺 擁抱 無視 閃過 收服了"
- The form of a sentence is like "雷神索爾 狠狠地打了 美國隊長!". A sentence including a subject (主詞) role, a verb, and an object (受詞) role.
- The subjects and the objects are randomly selected from the array “roles”. The subject and subject cannot be the same!
- An exclamation mark (!) should be added at the end of the sentence.
- Pictures of the subject role and the object role should be displayed in the next line of the sentence.
- For the display of verbs, please set the color to white and the background color to #FF9933.
- Please leave a blank space between the subject, the verb, and object.
- The font size of the subject and the object should be 150% of the verb.

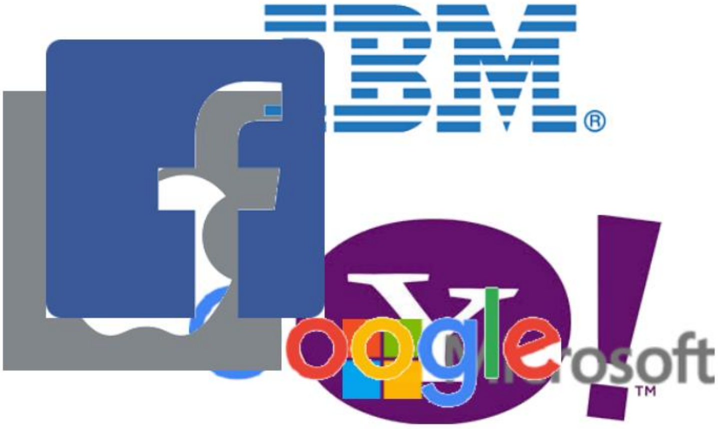
2. (20%) Please develop a logo show page:

- Show icons of six famous IT companies ("microsoft", "google", "yahoo", "facebook", "ibm", and "apple") in random orders and random coordinates (both X and Y should be larger than 100px and smaller than 400px).
- Shuffle these icons in random orders and random coordinates every 2 seconds (每 2 秒刷新畫面一次).

Initial view:



After two seconds:

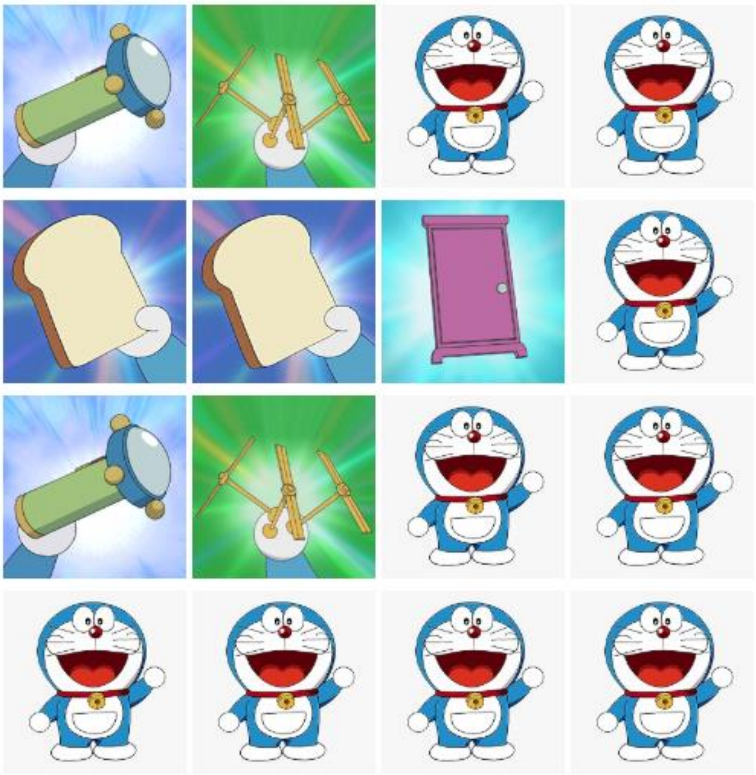


Hint:

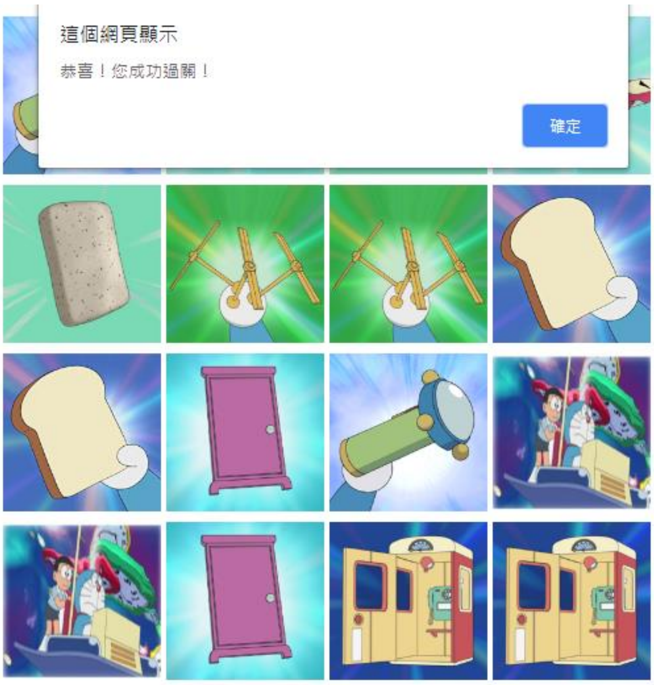
- The image file names can be stored in an array.
- Please set "absolute" position (top and left) for all pictures.
- Please update the page periodically by using "setInterval()".

3. (25%) Please develop a "memory" game that askes users to match the pairs of cards:

- Preparation: The 16 cards in this game are composed of 8 Doraemon accessory pictures (each picture appears twice). First, we have to shuffle the cards to mess up the order of these 16 cards.
- Initial UI: All 16 cards are covered (that is, displayed as doraemon.png). (Please refer to test-3-partial.html)
- Turn Over Card (翻牌): The user can tap any two cards in sequence, and the front of the two cards can be displayed in sequence.
  - If the two cards are the same pictures, they will not be flipped to the back (不會翻回背面) and will continue to display these two pictures of the same accessory.
  - If the two cards are not the same pictures, please change the picture back to "doraemon.png" (會翻回背面) after 0.5 seconds.



- Check Game Status: If all 16 cards are turned over successfully, the message "恭喜!您成功過關" will be displayed after 0.3 seconds.



這個網頁顯示

恭喜！您成功過關！

Hints:

- You can use Fisher–Yates shuffle algorithm：

```
-- To shuffle an array a of n elements (indices 0..n-1):
for i from n−1 downto 1 do
     j ← random integer such that 0 ≤ j ≤ i
     exchange a[j] and a[i]
```

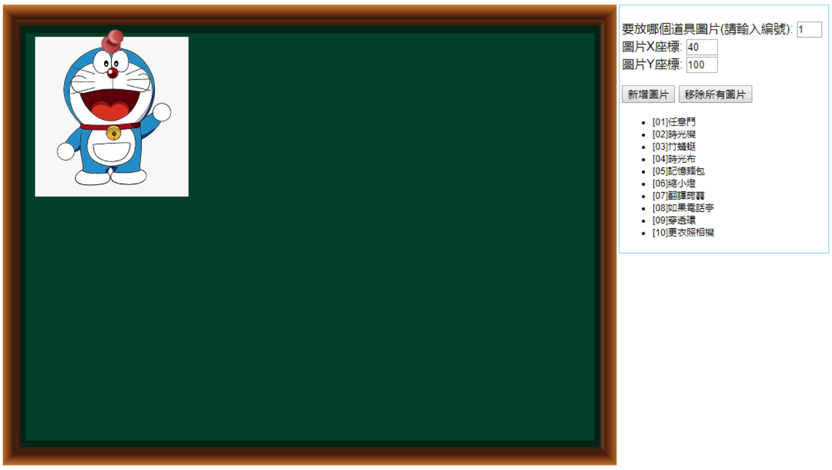
- It may be required to use setTimeout() to delay some actions. Two usages of setTimeout() are:

  window.setTimeout(func, delay); //指定要執行的function 名稱和延遲的毫秒數

  window.setTimeout(code, delay); //指定要執行的程式碼和延遲的毫秒數

4. (25%) Please develop a webpage to let a user to pin (釘) the pictures of Doraemon accessories (the same as the previous questions) to the blackboard.

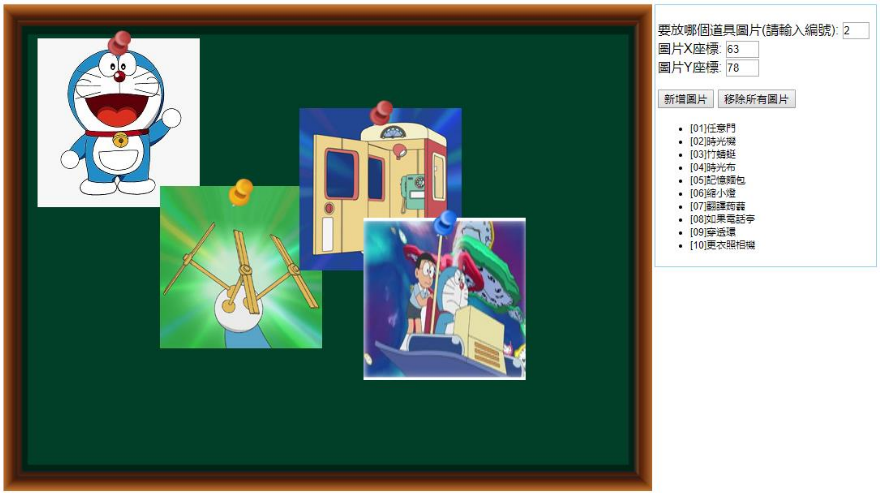
- Please refer to test-4-partial.html to obtain the initial UI. Notice that a pin (大頭針) is shown atop each picture.
  - We have images of three kinds of pins: blue.png, red.png, and yellow.png.



要放哪個道具圖片(請輸入編號): 1
圖片X座標: 40
圖片Y座標: 100

- [01]任意門
- [02]時光機
- [03]竹蜻蜓
- [04]時光布
- [05]記憶麵包
- [06]縮小燈
- [07]翻譯蒟蒻
- [08]如果電話亭
- [09]穿透環
- [10]更衣照相機

- The user can select the picture number, input the coordinate of X and Y, and click the button "新增圖片". A corresponding picture will appear in the blackboard. A random pin will be shown atop the picture (亂數決定大頭針的顏色，並顯示於圖片上層). A newly added picture should be displayed in front of old pictures.



要放哪個道具圖片(請輸入編號): 2
圖片X座標: 63
圖片Y座標: 78

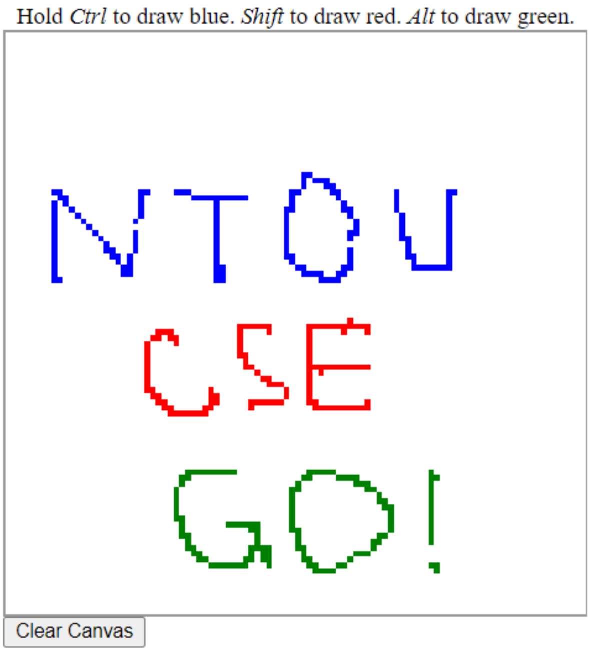
- [01]任意門
- [02]時光機
- [03]竹蜻蜓
- [04]時光布
- [05]記憶麵包
- [06]縮小燈
- [07]翻譯蒟蒻
- [08]如果電話亭
- [09]穿透環
- [10]更衣照相機

- When the user clicks the button "移除所有圖片", all pictures should be removed.

Hints:

- Please use “z-index” appropriately.
- Please observe the relative position of the pin and the picture, and design the rules to set the coordinates of the pin every time a picture is added.

5. (20%) Please modify fig. 13. 3 in our text book (test-5-basic.html):



Hold *Ctrl* to draw blue. *Shift* to draw red. *Alt* to draw green.

- In addition to Ctrl key and Shift key, please also allow users to draw in green by holding down the Alt key and moving the mouse over the box.
- Record the drawing using localStorage. In other words, you can still see the drawing you made if you close and re-open the webpage. (關閉瀏覽器重開仍可看到圖)
- Add a new button "Clear Canvas" to clear the canvas and the data stored in localStorage.

Hints:

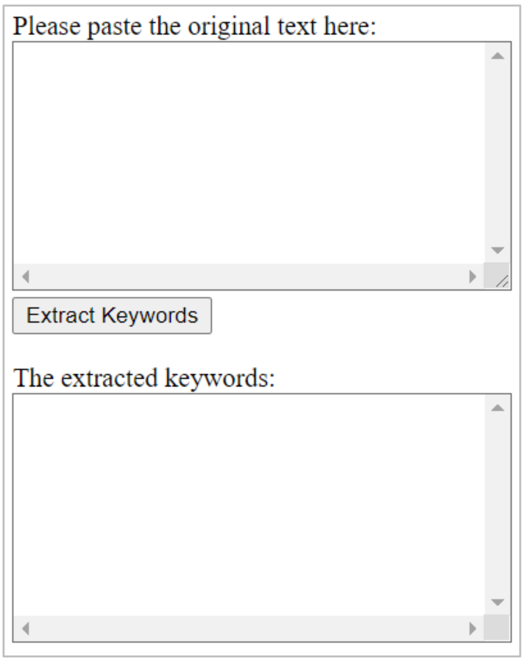
- The altKey property of the MouseEvent object should be used.
- You can set an id for each <td> to ease the processing.
- The key/value format of localStorage should be appropriately designed.

6. (25%) Please develop a keyword extraction application:

***Basic Front-end Page:** (10%)*

Please develop a simple page (based on *test-6-partial.html*) to let users input an article and to extract/display keywords:

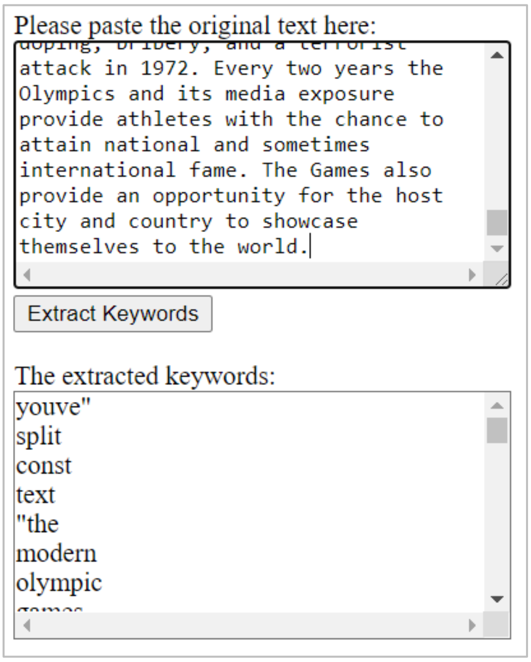
In the beginning:



Please paste the original text here:

The extracted keywords:

When the user inputs the text and clicks the "Extract Keywords" button:



Please paste the original text here:

```
doping, bribery, and a terrorist
attack in 1972. Every two years the
Olympics and its media exposure
provide athletes with the chance to
attain national and sometimes
international fame. The Games also
provide an opportunity for the host
city and country to showcase
themselves to the world.
```

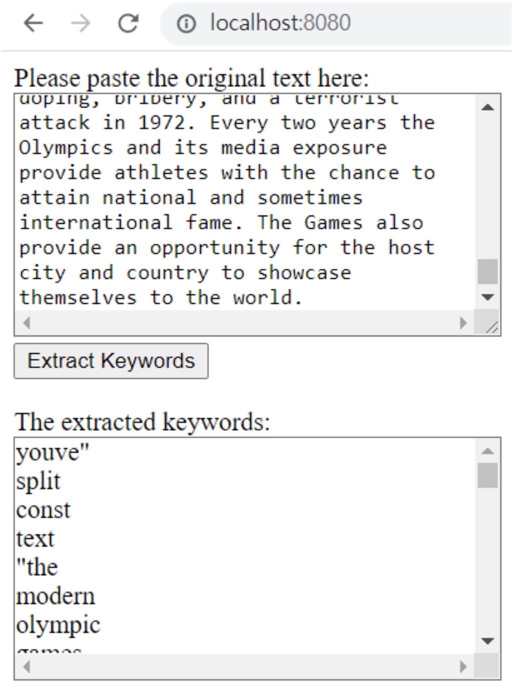
The extracted keywords:

```
youve"
split
const
text
"the
modern
olympic
games
```

***Advanced Backend API with Frond-end Page:** (15%)*

Please refactor the frontend-only page into two parts: a backend API in node.js (based on *tokenization-api-partial.js*) and a front-end page (based on *test-6-adv-partial.html*) that uses the backend API. The functionality of keyword extraction should be performed by the backend

Node.js API. The frond-end JavaScript code just calls the API. The refactored code will be used via a local URL (as shown below).



Please paste the original text here:

```
doping, bribery, and a terrorist
attack in 1972. Every two years the
Olympics and its media exposure
provide athletes with the chance to
attain national and sometimes
international fame. The Games also
provide an opportunity for the host
city and country to showcase
themselves to the world.
```

The extracted keywords:

```
youve"
split
const
text
"the
modern
olympic
```

Hints:

- Please simply implement all “TODO” blocks. You could revise the code if necessary.
- You could use “isFinite()” to distinguish numbers and non-numbers.
- Please understand how to execute a node.js application and use the application via a local URL.
- Please test your code by using the content of *text-1.txt* and *text-2.txt*.

7. (5%) Again, please provide lessons learned from this course and suggestions for this course.