COMP3421 WEB APPLICATION DESIGN AND DEVELOPMENT
FINAL EXAMINATION RECALL VERSION
2021-05-13

NAME: _____

STUDENT ID: _____

SIGNATURE: _____

Instructions:

1. The time allowed is 2 hours.
2. This examination has two parts. The first part is an online examination. The second part is an open-book examination.
   (a) The first part has 15 multiple-choice questions. Answer ALL the questions via the Blackboard system.
   (b) The second part has 7 questions. Answer ALL the questions on the answer sheet and finally upload answers via the Blackboard system.
3. Marks for each question are shown next to the question.

Q1-15(30)	Q16(5)	Q17(15)	Q18(10)	Q19(10)	Q20(5)	Q21(10)	Q22(15)

Compiled on: 2022-05-13

PART I: SHORT QUESTIONS (30 MARKS)

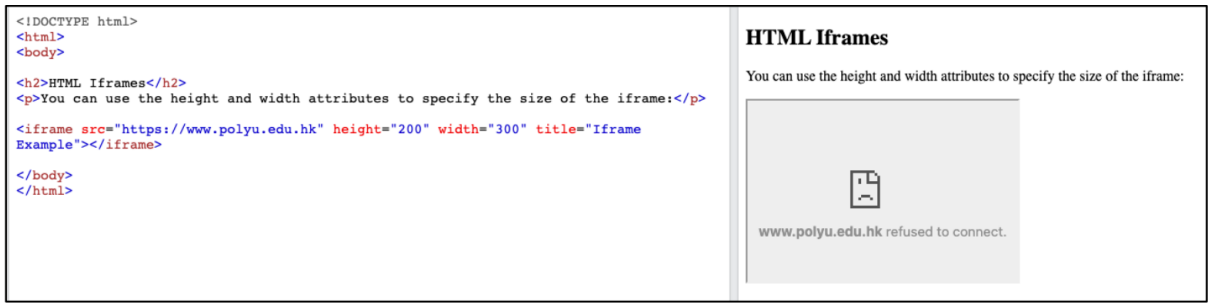
In this part, there are 15 multiple-choice questions. Answer ALL the questions directly on the Blackboard system. You only have one chance to submit your answers. If you submit, you cannot modify your answers anymore. You have 30 minutes to complete this part. You need to submit your answers before the due time. You can start to answer Part II immediately after finishing all Part I questions.

PART II: LONG QUESTIONS (70 MARKS)

In this part, there are 7 questions (Questions 16 – 22). Please answer ALL the questions on the answer sheet. You need to submit your answers via the Blackboard by the end of the examination.

QUESTION 16 (5 MARKS)

An HTML iframe is used to display a web page within another web page. A student would like to show the PolyU's official home page in his website using iframe. However, it fails as shown below:



```
<!DOCTYPE html>
<html>
<body>

<h2>HTML Iframes</h2>
<p>You can use the height and width attributes to specify the size of the iframe:</p>

<iframe src="https://www.polyu.edu.hk" height="200" width="300" title="Iframe
Example"></iframe>

</body>
</html>
```

HTML Iframes

You can use the height and width attributes to specify the size of the iframe:

www.polyu.edu.hk refused to connect.

Referring to the following HTTP response message from the PolyU web server, please explain why it fails to show the PolyU home page using the iframe?

200 RESPONSE

STATUS: 200 OK +

HEADERS

+ access-control-allow-origin:	*
+ cache-control:	no-cache, no-store,private, must-revalidate
+ connection:	keep-alive
+ content-encoding:	gzip
+ content-type:	text/html; charset=utf-8
+ date:	Mon, 10 May 2021 09:30:58 GMT
+ expires:	-1,0
+ pragma:	no-cache
+ referrer-policy:	same-origin
+ server:	nginx/1.19.2
+ set-cookie:	BIGipServerRP_CENTRAL_INFRA_HTTPS_POOL=rd1319o00000000000000000000ffff0a0d840co443; path=/; HttpOnly; secure
+ set-cookie:	BIGipServerWAF_WWW-PROD_One-Level_HTTP_8443_POOL=rd1322o00000000000000000000ffff0a0d842fo8443; path=/; Httponly; Secure
+ transfer-encoding:	chunked
+ x-frame-options:	SAMEORIGIN
+ x-xss-protection:	1; mode=block

QUESTION 17 (15 MARKS)

1. The tags of <audio> and <video> are used to show the multimedia on web pages. Referring to the following source code, please explain why multiple sources are presented inside the video tags? (5 marks)

```
<video width=``320'' height=``240'' controls>
    <source src=``movie.mp4'' type=``video/mp4''>
    <source src=``movie.ogg'' type=``video/ogg''>
    Your browser does not support the video tag.
</video>
```

2. Please specify which elements are selected by the following selectors? (5 marks)

```
div + li:last-child [href]{
    color:red;
    font-size:20px;
}
```

3. Regarding the following code, what color are the paragraphs shown in? Please explain the reason. (5 marks)

```
<!DOCTYPE html>
    <html>
        <head>
            <style>
                :not(p) {
                    color: red;
                }
            </style>
        </head>
        <body>
            <h1>This is a heading.</h1>

            <p>This is a paragraph.</p>
            <p>This is another paragraph.</p>

            <div>This is some text in a div element.</div>
        </body>
    </html>
```

QUESTION 18 (10 MARKS)

Font icons are fonts that contain symbols and glyphs instead of letters or numbers. They are popular for web designers since you can style them with CSS the same way as regular text. Since they are vectors and small, they are easily scalable and loaded quickly. They are supported in all browsers. Please create your own mathematical font icons to show HTML mathematical symbols. Specifically, you are required to define the CSS classes ".sigma", ".infinity", ".angle", ".volume-integral", ".forall". The following screenshot shows how we can use the defined classes to show these mathematic symbols like font icons. The left is the source code, and the right is the final effect on the web page.

ERRARA: The symbol for "Sigma" is not correct.

TIP: You can find the hexadecimal of the mathematical symbols at

https://www.w3schools.com/charsets/ref_utf_math.asp

```
<!DOCTYPE html>
<html>
<head>
<title>Google Icons</title>
<meta name="viewport" content="width=device-width, initial-scale=1">

<style>

.math {
  display: inline-block;
}

[The CSS classes are defined here ]

</style>
</head>
<body>

<p>Styled math font icons (size and color):</p>
 Sigma: <i class="math math-sigma" style="font-size:36px;color:red;"></i><br>
 Infinity: <i class="math math-infinity" style="font-size:36px;color:green;"></i><br>
 Angle:<i class="math math-angle" style="font-size:36px;color:blue;"></i><br>
 Volume integral:<i class="math math-volume-integral" style="font-size:36px;color:darkblue;">
</i><br>
 Forall: <i class="math math-forall" style="font-size:40px;color:darkgreen;"></i>

</body>
</html>
```

Styled math font icons (size and color):

Sigma: €

Infinity: ∞

Angle: ∠

Volume integral: ∭

Forall: ∀

QUESTION 19 (10 MARKS)

You are required to create an Olympic logo by using CSS. The logo is composed of five circles with different colors: blue(#0085c7), black(#000000), red(#df0024), yellow(#f4c300) and green(#009f3d). The source code is shown on the left and the final effect is shown on the right as below. In the source code, HTML only contains FOUR div elements. You should use these FOUR div elements to create the FIVE circles. The blue, black and red circles are given already. You are required to create the remaining yellow and green circles using the last div element whose class is "ring4". It is NOT allowed to add, edit, and delete any HTML elements. It is also NOT allowed to modify the existing CSS code. The offsets for the two circles are given in Figure 1.

```
<!DOCTYPE html>
<html>
<head>
    <style>
        .loader-wrapper {
            position: fixed;
            width: 100%;
            height: 100%;
        }
        .ring{
            position: absolute;
            width:100px;
            height:100px;
            border-radius: 50%;
            border: 10px solid;

        }
        .ring1 {
            border-color: #0085c7;
            left:0px;
        }

        .ring2 {
            border-color: black;
            left:140px;
        }
        .ring3 {
            border-color:#df0024;
            left:280px;
        }
        .ring4 {
            border: transparent;
        }
        [Your code is here]
    </style>
</head>

<body>
    <div class="loader-wrapper">
        <div class="ring ring1"></div>
        <div class="ring ring2"></div>
        <div class="ring ring3"></div>
        <div class="ring ring4"></div>
    </div>

</body>
```

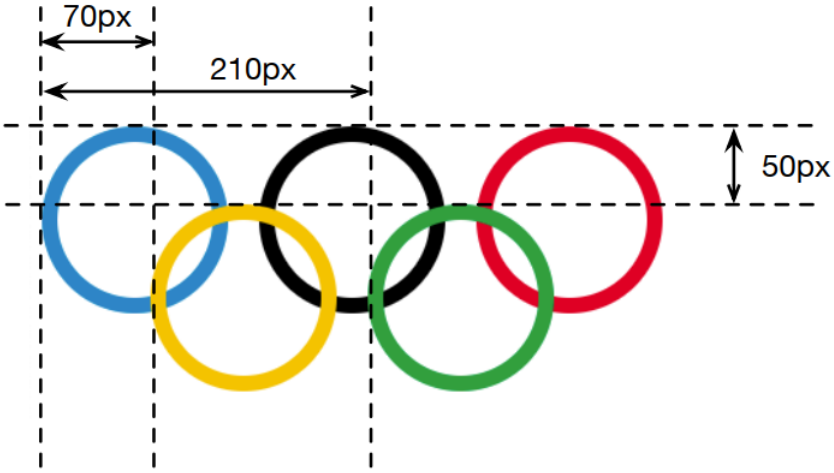


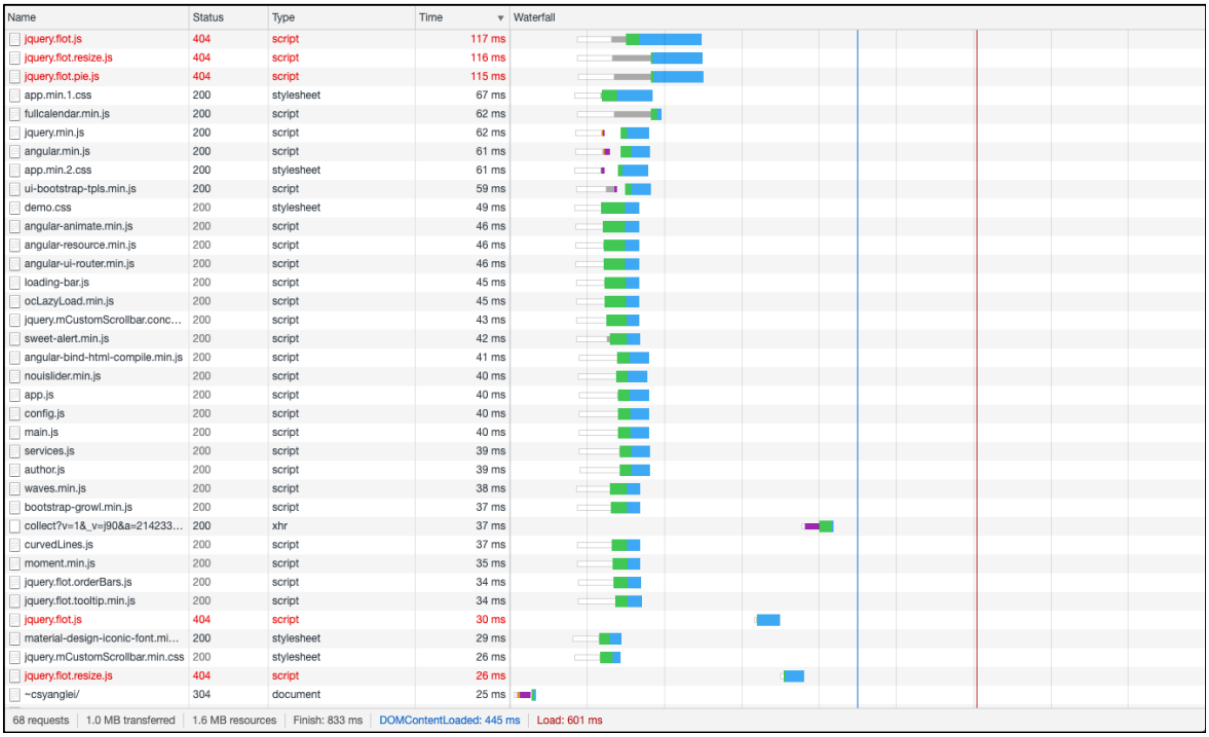
Figure 1: THE OFFSETS FOR THE YELLOW AND GREEN CIRCLES

QUESTION 20 (5 MARKS)

Figure 2 shows a screenshot of the network data captured by Chrome when accessing the home page of Dr. Yang's website. Referring to the acquired network data, please answer the following questions:

TIP: The figure only shows a part of HTTP requests/responses.

1. How many HTTP requests/responses are received by the browser? (1 marks)
2. What is the average response time? (2 marks)
3. What is the peak response time? (2 marks)



Name	Status	Type	Time	Waterfall
jquery.flot.js	404	script	117 ms	
jquery.flot.resize.js	404	script	116 ms	
jquery.flot.pie.js	404	script	115 ms	
app.min.1.css	200	stylesheet	67 ms	
fullcalendar.min.js	200	script	62 ms	
jquery.min.js	200	script	62 ms	
angular.min.js	200	script	61 ms	
app.min.2.css	200	stylesheet	61 ms	
ui-bootstrap-tpls.min.js	200	script	59 ms	
demo.css	200	stylesheet	49 ms	
angular-animate.min.js	200	script	46 ms	
angular-resource.min.js	200	script	46 ms	
angular-ui-router.min.js	200	script	46 ms	
loading-bar.js	200	script	45 ms	
ocLazyLoad.min.js	200	script	45 ms	
jquery.mCustomScrollbar.conc...	200	script	43 ms	
sweet-alert.min.js	200	script	42 ms	
angular-bind-html-compile.min.js	200	script	41 ms	
nouislider.min.js	200	script	40 ms	
app.js	200	script	40 ms	
config.js	200	script	40 ms	
main.js	200	script	40 ms	
services.js	200	script	39 ms	
author.js	200	script	39 ms	
waves.min.js	200	script	38 ms	
bootstrap-growl.min.js	200	script	37 ms	
collect?v=1&_v=j90&a=214233...	200	xhr	37 ms	
curvedLines.js	200	script	37 ms	
moment.min.js	200	script	35 ms	
jquery.flot.orderBars.js	200	script	34 ms	
jquery.flot.tooltip.min.js	200	script	34 ms	
jquery.flot.js	404	script	30 ms	
material-design-iconic-font.mi...	200	stylesheet	29 ms	
jquery.mCustomScrollbar.min.css	200	stylesheet	26 ms	
jquery.flot.resize.js	404	script	26 ms	
~csyanglei/	304	document	25 ms	

68 requests | 1.0 MB transferred | 1.6 MB resources | Finish: 833 ms | DOMContentLoaded: 445 ms | Load: 601 ms

Figure 2: Network Data(The figure only shows a part of HTTP requests/responses)

QUESTION 21 (10 MARKS)

Pay-per-click (PPC) is a model of internet marketing in which advertisers pay a fee each time one of their ads is clicked. Essentially, it is a way of buying visits to your site. Search engine advertising is one of the most popular forms of PPC. It allows advertisers to bid for ad placement in a search engine's sponsored links when someone searches on a keyword that is related to their business offering. Every time your ad is clicked, sending a visitor to your website, you have to pay the search engine a small fee. Regarding the PPC, please answer the following questions.

1. Write PHP code to count how many visits are navigated from Google and Bing search engines respectively.(5 marks)
2. Create two cookies to record the number of visits that the user is navigated from the Google or Bing search engines. The cookies are named "google-counter" and "bing-counter" with initial values of zero. The cookies are expired after one year. When the user is navigated from Google (or Bing), the cookie of google-counter (or bing-counter) is increased by one.(5 marks)

QUESTION 22 (15 MARKS)

JavaScript is the programming language of HTML and the Web. A JavaScript function is a block of code designed to perform a particular task. Please write JavaScript code to accomplish the following tasks:

1. Referring to the following code, please tell what results will be printed out on the console (highlighted with label 1 - 4)? Please explain the reason.(2 mark for each, total 8 marks)

```
<!DOCTYPE html>
<html>
<body>

<h2>JavaScript Objects</h2>

<p id="demo"></p>

<script>
function Person(first, last, age, eye) {
  this.firstName = first;
  this.lastName = last;
  this.age = age;
  this.eyeColor = eye;
}

var myFather = new Person("John", "Doe", 50, "blue");
var myMother = new Person("Sally", "Rally", 48, "green");

Person("Tony", "Ray", 48, "green");

console.log(lastName); 1

console.log(myFather.nationality); 2

Person.prototype.nationality = "French";
myFather.nationality = "Chinese";

console.log(myFather.nationality); 3

console.log(myMother.nationality); 4


</script>

</body>
</html>
```

2. Please create a closure to limit the access of the variable named “password”. Any code outside this closure cannot directly change the password. The password can be only updated and reset through two functions: “update (newPassword)” and “reset ()”. (5 marks)

3. Please fill in the blank to call the person.fullname() but print out “Mary Doe” on the console. (2 marks)

```
<!DOCTYPE html>
<html>
<body>

<script>
var person = {
  fullName: function() {
    return this.firstName + " " + this.lastName;
  }
}
var person1 = {
  firstName:"John",
  lastName: "Doe"
}
var person2 = {
  firstName:"Mary",
  lastName: "Doe"
}

console.log(__________);

</script>

</body>
</html>
```

END