



University of Maryland College Park

Department of Computer Science

CMSC122 Fall 2022

Final Exam

FIRSTNAME, LASTNAME (PRINT IN UPPERCASE):

KEY

STUDENT ID (e.g. 123456789):

Instructions

- Please print your answers and use a pencil.
- This exam is a closed-book, closed-notes exam with a duration of 120 minutes and 170 total points.
- **Do not remove the exam's staple.** Removing it will interfere with the scanning process (even if you staple the exam again).
- Write your directory id (e.g., terps1, not UID) at the bottom of pages with **DirectoryId**.
- Provide answers on the provided lines or the rectangular areas.
- Do not remove any exam pages. Even if you don't use the extra pages for scratch work, return them with the rest of the exam.
- Your code must be efficient and as short as possible.
- If you continue a problem on the extra page(s) provided, make a note on the particular problem.
- You don't need to use meaningful variable names; however, we expect good indentation.
- **You must write your name and id at this point (we will not wait for you after time is up).**
- You must stop writing once time is up.

Grader Use Only

Part #1 (Short Answer 2 pts each)	32
Part #2 (Short Answer 3 pts each)	60
Part #3 (HTML Code)	30
Part #4 (JS Code)	48
Total	170

Part #1 (Short Answer – 2 pts each)

1. Write an HTML level 3 heading with the content Final Exam. `<h3> Final Exam </h3>`
2. Circle the one tag that should not be in this group: `<table>`, `<th>`, `<td>`, `<dt>`, `<tr>`
3. Circle just the attribute in the following HTML element:

`<p lang = "en"> Hello </p>`

4. Write an HTML comment that says: my table. `<!-- my table -->`
5. How many levels of headings are there in HTML? 6
6. What is the HTML tag used to add an image? ``
7. What attribute is used with the image tag to provide the path to the source file that has the image? `src`
8. Circle the one inline element. `<a>`, `<div>`, `<p>`, `<table>`
9. What HTML tag do you put CSS rules in when using an internal style sheet? `<style>`
10. Circle just the declaration in this CSS rule: `.intro {font-style: normal;}`
11. Circle just the selector in this CSS rule: `.intro {font-style: normal;}`
12. Using just p as the selector of a CSS rule would be an example of using this type of selector? `type`
13. In the CSS box model, this is the space between the content and the border? `padding`
14. In the CSS box model, this is the space outside of the border? `margin`
15. If a JavaScript variable is assigned true or false, it is this type of variable? `boolean`
16. As opposed to the recursive case in a recursive function, this is the case where the recursion is stopped and possibly a value is returned ? `base`

Part 2 – Short Answers (3 points each)

17. Write the HTML code, so that when you click on the word UMD, it goes to the UMD website (www.umd.edu).

`UMD ` (https instead of http is ok too)

18. Given:

```
let num = 7;
let myVar = num++;
myVar+=3;
alert(myVar % 4);
```

What will display in the alert box? 2

19. Given:

```
let myVar1 = 10;
if (myVar1 < 20 && myVar1 != 10)
    alert("line 1");
else if (myVar1 < 30)
    alert("line 2");
else
    alert("line 3");
```

What will the alert box display? **line 2**

20. Given:

```
let myVar1 = 10;
//if (myVar1 < 20 )
    alert("line 1");
if (myVar1 < 10)
    alert("line 2");
else{
    if (myVar1 < 0)
        alert("line 3");
}
```

What will the alert box display (There is no typo in this question)? **line 1**

21. Given:

```
let count = 6 ;
for (let i =0; i<7; i++){

    if (i>=2 && (i % 2==0)){
        count--;
    }
    if (i==4)
        count =18;

}
alert(count);
```

What will the alert box display? **17**

22. Given the code below, how many alert boxes with Hello will show up? **2**

```
let count = 4;
do {
    alert("Hello");
    count+=5;
} while (count < 10);
```

23. Convert 42 into binary (no calculators allowed).

101010

24. Convert 71 into octal (no calculators allowed).

107

25. Given:

```
function addMethod(x, y)
{
    let result = x + y;
    return result;
}
let answer = addMethod(5,7);
alert(result);
```

What is the most obvious problem with the code above? **Result is out of scope**

26. Given the code below, how many alert boxes with Hello will show up? **9**

```
for (let i= 2; i < 5; i++)
{
    for (let j= i; j <= 5; j++) {
        alert ("Hello");
    }
}
```

27. Given:

```
function  mystery(x){
    if (x > 0)
        return x * mystery(x - 3) * mystery(x - 3);
    else
        return 1;
}
alert(mystery(5));
```

What will the alert box display? **20**

28. Given the code below:

```
let myArray1=[];
let myArray2 =myArray1
myArray1.push(20);
myArray2.push(25);
myArray1 =[5,6,7];
myArray2[0]=100;
myArray2 =myArray1
alert(myArray2);
```

What will the alert box display? **5,6,7**

29. Assume the following JavaScript code:

```
function example1(myNum) {  
    myNum = 100;  
}  
function main(){  
    let myNum =50;  
    example1(myNum);  
    alert(myNum);  
}  
main();
```

What will display in the alert box? **50**

30. Assume the following JavaScript code:

```
function example2(myArr) {  
    myArr[0]+=myArr[2];  
}  
function main(){  
    let arr =[2,3,4];  
    arr=example2(arr);  
    alert(arr);  
}  
main();
```

What will display in the alert box? **Undefined**

31. Assume the following JavaScript code:

```
function example3(myArr) {  
    myArr[0]=myArr[2];  
}  
function main(){  
    let arr =[2,3,4];  
    alert(example3(arr));  
}  
main();
```

What will display in the alert box? **Undefined**

32. Assume the following JavaScript code:

```
function example4(myArr) {  
    myArr[0]=myArr[2];  
}  
function main(){  
    let arr =[2,3,4];  
    example4(arr);  
    alert(arr[0]+arr[1]);  
}  
main();
```

What will display in the alert box? **7**

Directory id:

33. Explain what this CSS rule does: `div h1 {color:blue;}`

It makes blue all h1 that are descendants of a div (i.e. nested in a div tag)

34. Explain what this CSS rule does: `#first {color:blue;}`

It makes blue the one element that has the id first

35. Explain what this CSS rule does: `.extra {color:blue;}`

It makes blue all elements in the extra class

36. Re-Write the following HTML element: `<h1> Some notes </h1>` using inline CSS to change the font-style to italic.

`<h1 style="font-style: italic;">Some notes</h1>`

Part #3 (HTML CODE)

37. (12 pts) Write the code to make the following list. You don't need to use any HTML attributes. The indentation is the default the browser provides. Just write the HTML to make the list.

1. CMSC 122

HTML
Structure
CSS
Style

2. Some other class

```
<ol>
  <li>CMSC 122
    <dl>
      <dt>HTML</dt>
      <dd>Structure</dd>
      <dt>CSS</dt>
      <dd>Style</dd>
    </dl>
  </li>
  <li>
    Some other class
  </li>
</ol>
```

38. (18 pts) Write the code to make the following table. The value of the `border` attribute is 1. No CSS, just write the HTML to make the table. Use the table header tag `<th>` in the first row only.

	text1	
text2	text3	text4
	text5	text6

```
<table border="1">
  <tr >
    <th></th>
    <th colspan="2"> text1</th>
  </tr>
  <tr >
    <td rowspan="2">text2</td>
    <td>text3</td>
    <td>text4</td>
  </tr>
  <tr >
    <td>text5</td>
    <td>text6</td>
  </tr>
</table>
```

Part #4 (JS CODE)

39. (16 pts) Write a function called `atLeastOne` that will have 2 array parameters called `myArray1` and `myArray2`. You can assume that the arguments passed in will be arrays that have integers, the arrays will have at least one element, and both will have the same length. The function will return `true` if the two arrays have **at least one equal value at the same index**. Otherwise, it returns `false`.

```
<script>
//write your code for atLeastOne here
function atLeastOne(myArray1, myArray2) {

    for(let i = 0; i < myArray1.length; i++)
    {
        if(myArray1[i]==myArray2[i])
            return true;
    }
    return false;
}

function main(){

    let test1 = [7,5,4];
    let test2 = [17,5,41];
    let test3 = [6,4,43];
    let test4 = [81,32,45,16];
    let test5 = [18,12,45,117];
    let test6 = [32,81,16,45];
    alert(atLeastOne(test1,test2)); //true both have 5 at index 1
    alert(atLeastOne(test1,test3)); //false
    alert(atLeastOne(test4,test5)); //true both have 45 at index 2
    alert(atLeastOne(test4,test6)); //false
}
main();
</script>
```


40. (16 pts) Write a function called `print` that will have an integer parameter called `target`. The function should write out to the webpage a triangle of integers where each row ends with `*`. The triangle will have `target` rows, where each row will have one more integer than the previous row (the rows have consecutive integers starting at 1).

If the call is <code>print(9)</code> ; the output is	If the call is <code>print(5)</code> ; the output is
<pre> * 1 * 1 2 * 1 2 3 * 1 2 3 4 * 1 2 3 4 5 * 1 2 3 4 5 6 * 1 2 3 4 5 6 7 * 1 2 3 4 5 6 7 8 * </pre>	<pre> * 1 * 1 2 * 1 2 3 * 1 2 3 4 * </pre>

You can assume a positive integer is always passed in as the argument. When you write out to the webpage, you can write out the numbers without using any tags (e.g. `<p>`), but make sure to use `
` to go to a new line for each row. Your function should not return anything. Just write the function, no `main` needed.

`<script>`

`//write your code for print here`

`function print(target) {`

```

    for(let i = 1; i<=target; i++)
    {
        for(let j = 1; j <= i; j++)
        {
            if(i==j)
                document.write( "*" );
            else
                document.write(j + " ");
        }
        document.write("<br>");
    }
}
```

`</script>`

41. (16 pts) Write a function called `sumIfFound` with one array parameter called `myArray` and an integer parameter called `target`. You can assume `myArray` is a reference to an array of integers with at least one element and that `target` is an integer. If `target` is in the array, the function will replace the first occurrence of `target` with the sum of all the other values in the array. If `target` is not in the array, the array is not changed. The function does not return any value and does not write out to the webpage. For the case of an array with just one element that is the `target`, the element will become zero.

//write your code for sumIfFound function here

```
function sumIfFound(myArray, target) {  
  
    let found = false;  
    let index, sum =0;  
  
    for(let i = 0; i<myArray.length; i++)  
    {  
  
        if(!found && myArray[i]==target)  
        {  
            found =true; //found 1st target  
            index =i; //index of 1st target  
        }  
        else{  
            sum+= myArray[i];  
        }  
    }  
    if (found){  
        myArray[index] =sum;  
    }  
}
```

```
function main(){  
  
    let test1 = [7,5,4,4,13];  
    let test2 = [17,5,41,5,31];  
  
    sumIfFound(test1,4);  
    // alert(test1) will output 7,5,29, 4, 13 since 1st 4 is replace with sum of 7+5+4+13  
    alert(test1);  
  
    sumIfFound(test2,8);  
    alert(test2);//will output 17,5,41,5,31 since no 8 in test2  
  
}  
main();  
  
</script>
```

EXTRA PAGE IN CASE YOU NEED IT (SUBMIT WITH THE EXAM)

LAST PAGE