Lab: This

1. Area and Volume Calculator

Write a function which **calculates** the **area** and the **volume** of a figure, which is **defined** by its **coordinates** (**x**, **y**, **z**).

area()

`function area() {`
`    return this.x * this.y;`
`};`

vol()

`function vol() {`
`    return this.x * this.y * this.z;`
`};`

solve()

`function solve(area, vol, input) {`
`    //ToDo....`
`}`

Input

You will receive **3** parameters - the **functions area** and **vol** and a **string**, which contains the figures' coordinates.

For more information check the examples.

Output

The output should be **returned** as an **array of objects**. Each object has **two properties**: the figure's **area** and **volume**.

```
[
  { area: ${area1}, volume: ${volume1} },
  { area: ${area2}, volume: ${volume2} },
  . . .
]
```

Note:

Submit only the solve function.

Examples

Sample Input	Output

`area, vol, '[`
`{"x":"1","y":"2","z":"10"},`
`{"x":"7","y":"7","z":"10"},`
`{"x":"5","y":"2","z":"10"}`
`]'`
	`[`
	`  { area: 2, volume: 20 },`
	`  { area: 49, volume: 490 },`
	`  { area: 10, volume: 100 }`
	`]`

`area, vol, '[`
`{"x":"10","y":"-22","z":"10"},`
`{"x":"47","y":"7","z":"-5"},`
`{"x":"55","y":"8","z":"0"},`
`{"x":"100","y":"100","z":"100"},`
`{"x":"55","y":"80","z":"250"}`
`]'`
	`[`
	`  { area: 220, volume: 2200 },`
	`  { area: 329, volume: 1645 },`
	`  { area: 440, volume: 0 },`
	`  { area: 10000, volume: 1000000 },`
	`  { area: 4400, volume: 1100000 }`
	`]`

2. Person

Write a JS program which takes **first** & **last** names as **parameters** and returns an object with **`firstName`**, **`lastName`** and **`fullName`** (**`"{firstName} {lastName}"`**) properties which should be all **accessibles**, we discovered that "accessible" also means "mutable". This means that:

- If .**`firstName`** or .**`lastName`** have changed, then .**`fullName`** should also be changed.
- If .**`fullName`** is changed, then .**`firstName`** and .**`lastName`** should also be changed.
- If **`fullName`** is **invalid**, you should not change the other properties. A **valid `full` name** is in the format

`"{firstName} {lastName}"`

Note: For more information check the examples below.

Examples

Sample Input

`let person = new Person("Peter", "Ivanov");`
`console.log(person.fullName);//Peter Ivanov`
`person.firstName = "George";`
`console.log(person.fullName);//George Ivanov`
`person.lastName = "Peterson";`
`console.log(person.fullName);//George Peterson`
`person.fullName = "Nikola Tesla";`
`console.log(person.firstName)//Nikola`
`console.log(person.lastName)//Tesla`

`let person = new Person("Albert", "Simpson");`
`console.log(person.fullName);//Albert Simpson`
`person.firstName = "Simon";`

```
console.log(person.fullName);//Simon Simpson
person.fullName = "Peter";
console.log(person.firstName) // Simon
console.log(person.lastName) // Simpson
```

3. ArrayMap

Write a function that takes **2 parameters** (**array** and a **function**) that uses **`.reduce()`** to implement a simple version of **`.map()`.**

Input

You will receive **2** parameters - an **array**, and a **function**.

Output

The output should be **returned** as a **new array** (changed according to the given function).

For more information check the examples below.

Examples

Sample exectuion

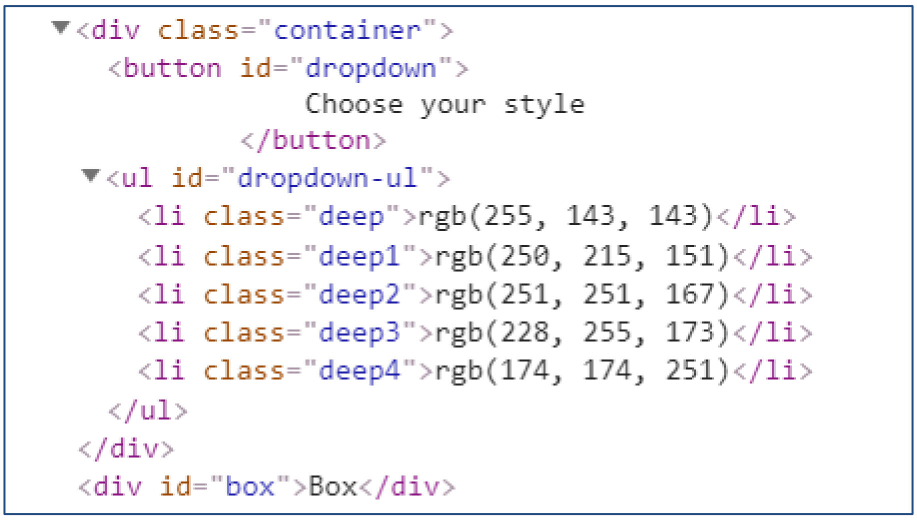
`let nums = [1,2,3,4,5];`
`console.log(arrayMap(nums,(item)=> item * 2)); // [ 2, 4, 6, 8, 10 ]`

`let letters = ["a","b","c"];`
`console.log(arrayMap(letters,(l)=>l.toLocaleUpperCase())) // [ 'A', 'B', 'C' ]`

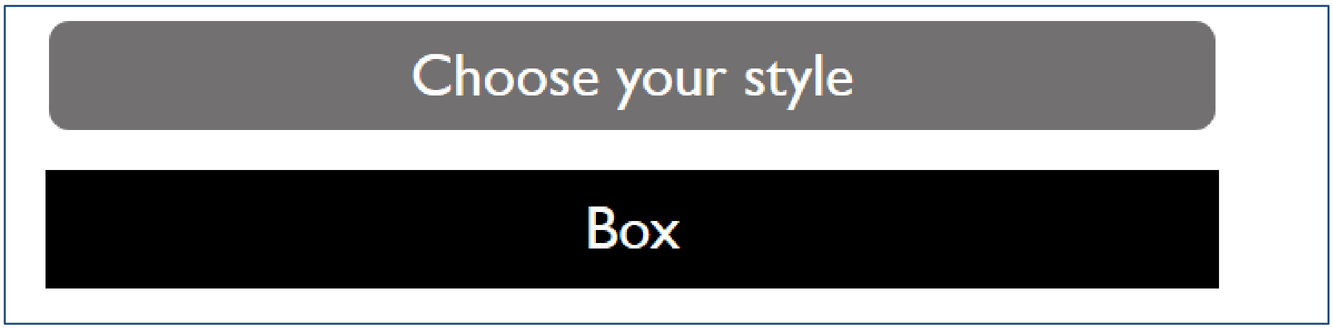
4. Dropdown Menu

Use the Given Skeleton to Solve This Problem.

Note: You Have NO Permission to Change Directly the Given HTML (Index.html File).



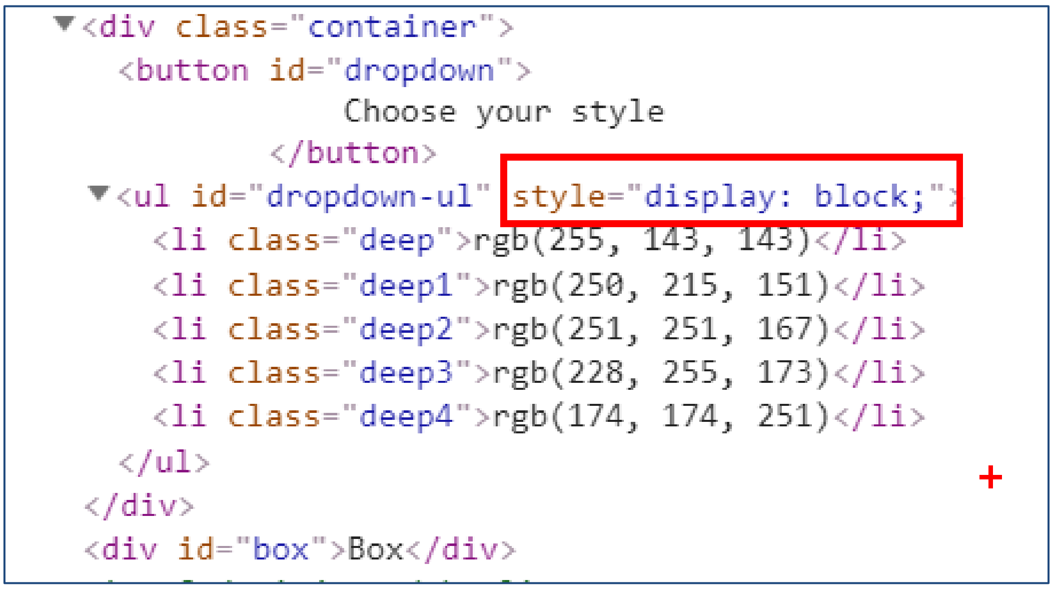
```
▼<div class="container">
   <button id="dropdown">
               Choose your style
           </button>
  ▼<ul id="dropdown-ul">
     <li class="deep">rgb(255, 143, 143)</li>
     <li class="deep1">rgb(250, 215, 151)</li>
     <li class="deep2">rgb(251, 251, 167)</li>
     <li class="deep3">rgb(228, 255, 173)</li>
     <li class="deep4">rgb(174, 174, 251)</li>
   </ul>
 </div>
 <div id="box">Box</div>
```



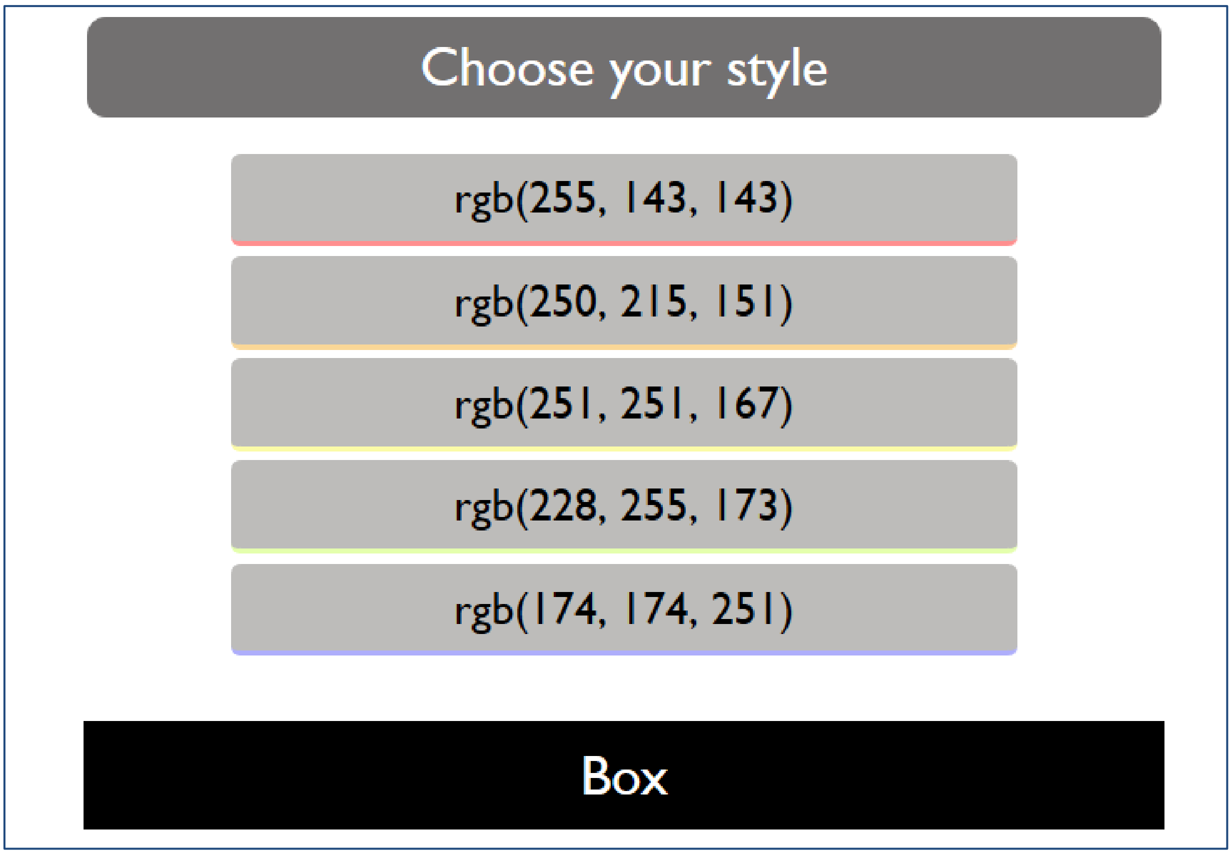
Your Task

Write the missing JavaScript code to make the **Dropdown Menu** application work as expected.

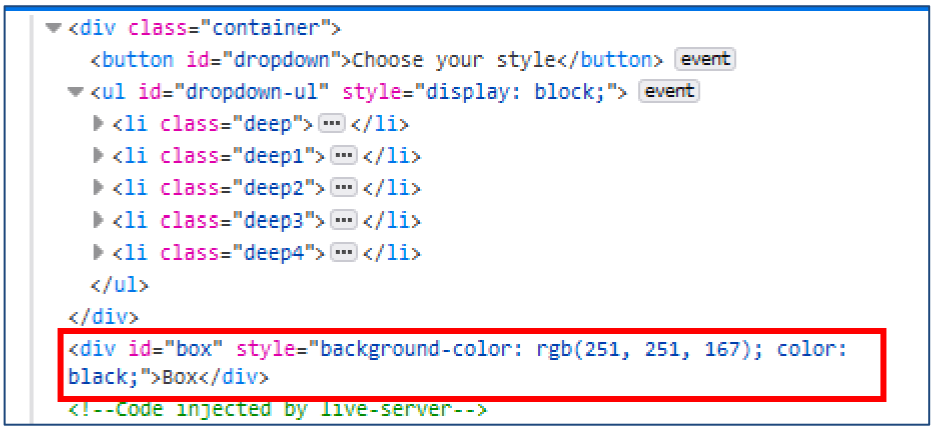
When you **click** on the [Choose your style] button, the elements of the menu should become visible.



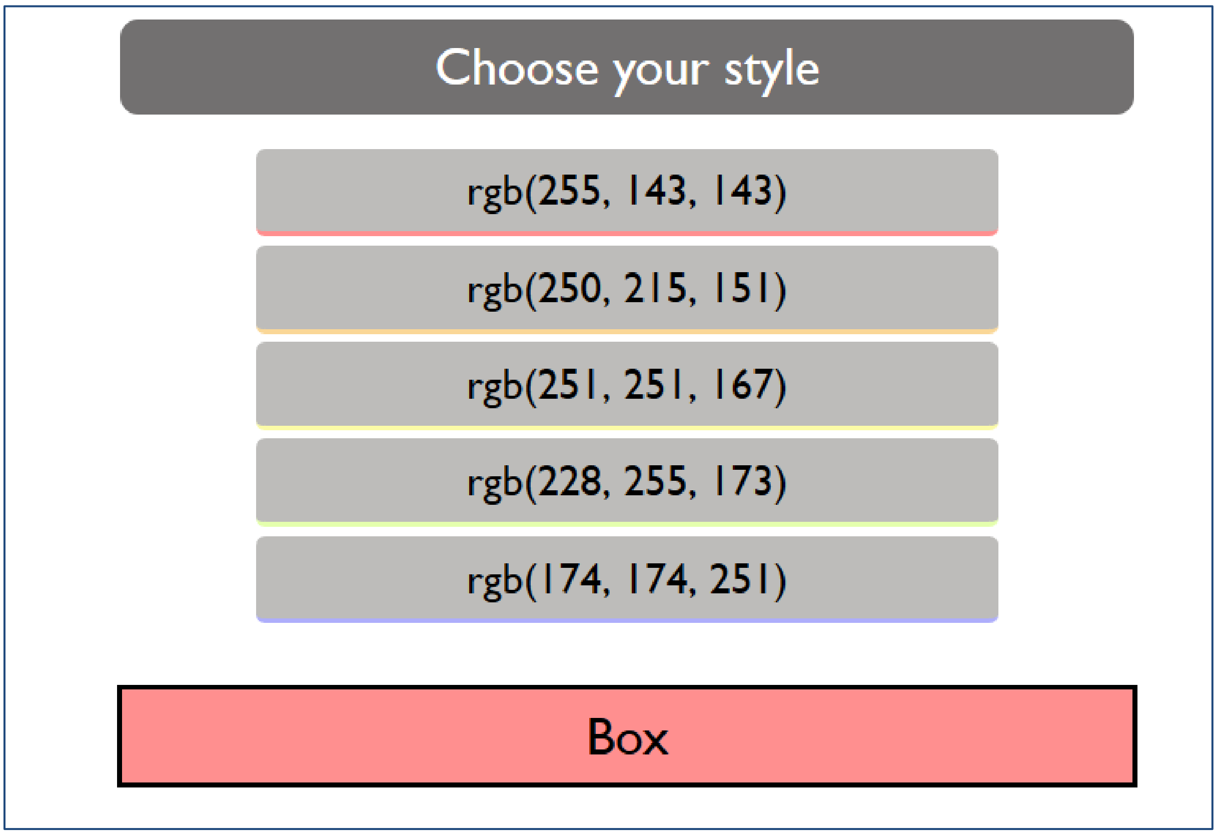
```
▼<div class="container">
   <button id="dropdown">
               Choose your style
           </button>
  ▼<ul id="dropdown-ul" style="display: block;">
     <li class="deep">rgb(255, 143, 143)</li>
     <li class="deep1">rgb(250, 215, 151)</li>
     <li class="deep2">rgb(251, 251, 167)</li>
     <li class="deep3">rgb(228, 255, 173)</li>
     <li class="deep4">rgb(174, 174, 251)</li>
   </ul>
 </div>
 <div id="box">Box</div>
```

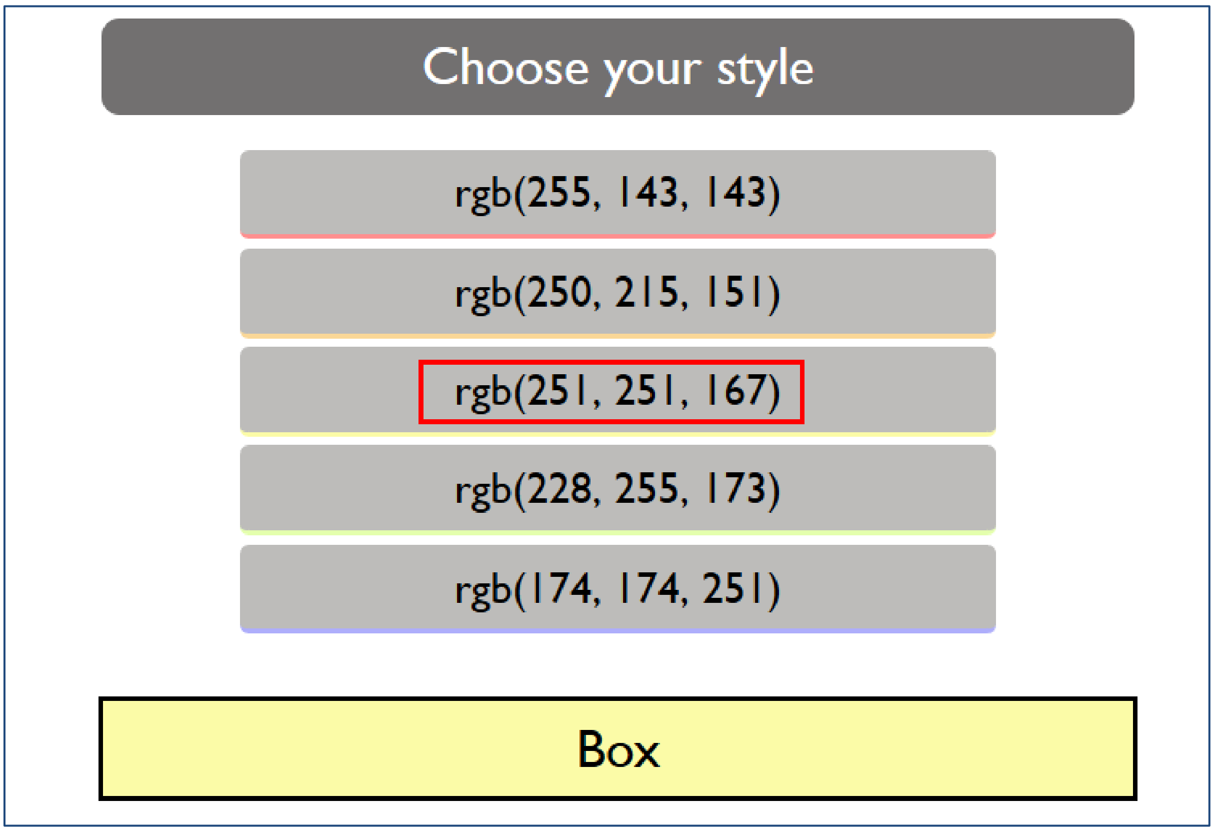


When you click on one of the items the background color of the box below should be changed to the RGB, which is displayed in the list item

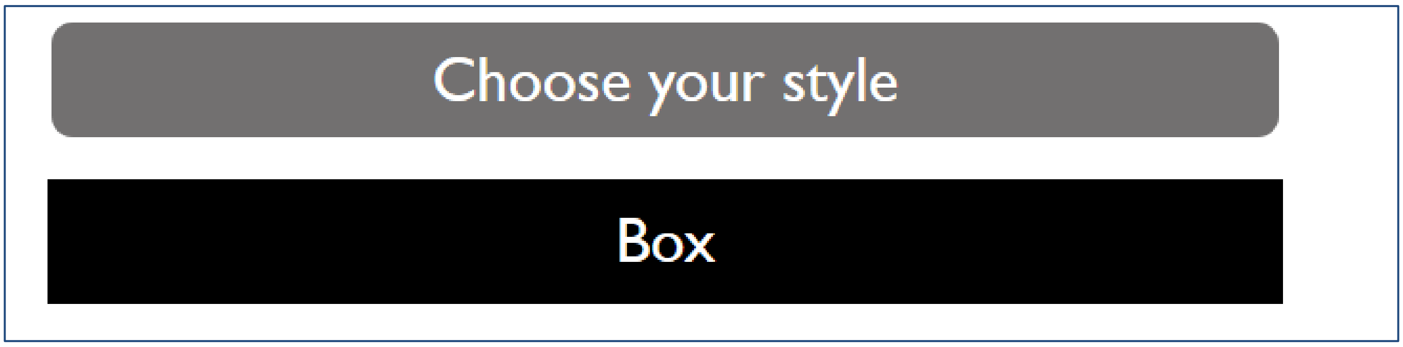


```
▼<div class="container">
   <button id="dropdown">Choose your style</button> event
  ▼<ul id="dropdown-ul" style="display: block;"> event
    ▶<li class="deep">⋯</li>
    ▶<li class="deep1">⋯</li>
    ▶<li class="deep2">⋯</li>
    ▶<li class="deep3">⋯</li>
    ▶<li class="deep4">⋯</li>
   </ul>
 </div>
 <div id="box" style="background-color: rgb(251, 251, 167); color:
 black;">Box</div>
 <!--Code injected by live-server-->
```





When the `[Choose your style]` button **is clicked** again, you should hide the list items, and the box should be returned to its initial state.



5. Spy

Write a function that takes **2 parameters** **`target`**(an object) and **`method`**(a string) and tracks **how many times** the method of an object is **called**.

Input

- **`target`**: an **object** containing the **method**
- **`method`**: a **string** with the **name of the method** on target to spy on

Output

The output should be **returned** as an **object** with property **count**, which holds how many times the provided method is invoked.

Examples

Sample exectuion

`let obj = {`
`    method:()=>"invoked"`
`}`
`let spy = Spy(obj,"method");`
 	
`obj.method();`
`obj.method();`
`obj.method();`
 	
`console.log(spy) // { count: 3 }`

`let spy = Spy(console,"log");`
 	
`console.log(spy); // { count: 1 }`
`console.log(spy); // { count: 2 }`
`console.log(spy); // { count: 3 }`

Hints

Check the code below.

```
function Spy(target, method) {
    let originalFunction = target[method]

    // use an object so we can pass by reference, not value
    // i.e. we can return result, but update count from this scope
    let result = {
        count: 0
    }

    // replace method with spy method
    target[method] = function () {
        result.count++ // track function was called
        return originalFunction.apply(this, arguments) // invoke original function
    }

    return result
}
```