

Software Studio

軟體設計與實驗

Calculator

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HTML with JavaScript

- Now you have learned the basic scripting of JavaScript, then you can use JS to make your HTML pages more dynamic and interactive!

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

<h2>What Can JavaScript Do?</h2>

<p>JavaScript can change HTML attributes.</p>

<p>In this case JavaScript changes the src (source) attribute of an image.</p>

<button onclick="document.getElementById('myImage').src='pic_bulbon.gif'">
Turn on the light
</button>



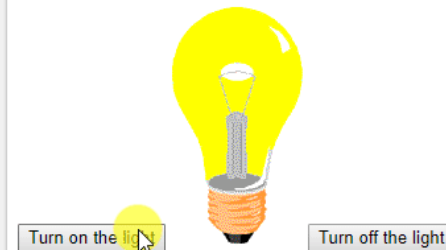
<button onclick="document.getElementById('myImage').src='pic_bulboff.gif'">
Turn off the light
</button>

</body>
</html>
```

What Can JavaScript Do?

JavaScript can change HTML attributes.

In this case JavaScript changes the src (source) attribute of an image.



onclick Event

- The **onclick** event occurs when the user clicks on an element.
 - The click event will occur after the mousedown and mouseup events.
 - Only one onclick handler can be assigned to an object at a time with this property.
- [MDN onclick](#)
- [w3schools onclick](#)

```
<element onclick="myScript">
```



Keyboard Event

- **onkeydown, onkeypress or onkeyup**
- Keyboard event can be an object that describe a user interaction with the keyboard.
- [MDN Keyboard](#)
- [w3schools Keyboard](#)

```
<body onkeypress="myscript"></body>
```



DOM

- The Document Object Model (DOM) is an application programming interface for HTML.
- It defines the logical structure of documents and **the way a document is accessed and manipulated.**



Document

- The HTML DOM document object is the **owner of all other objects** in your web page.
 - Document object represents your web page.
- If you want to access any element in your web page, always start with accessing the document object.



Finding HTML Elements

- The **getElementById()** method returns the element that has the ID attribute with the specified value.
- An ID should be **unique** within a page.
 - If more than one, return the first element.

```
var text = document.getElementById("screen");  
text.value = "Hello world!"
```



Change HTML elements

- We can modify the content of an HTML element by using **innerHTML**.

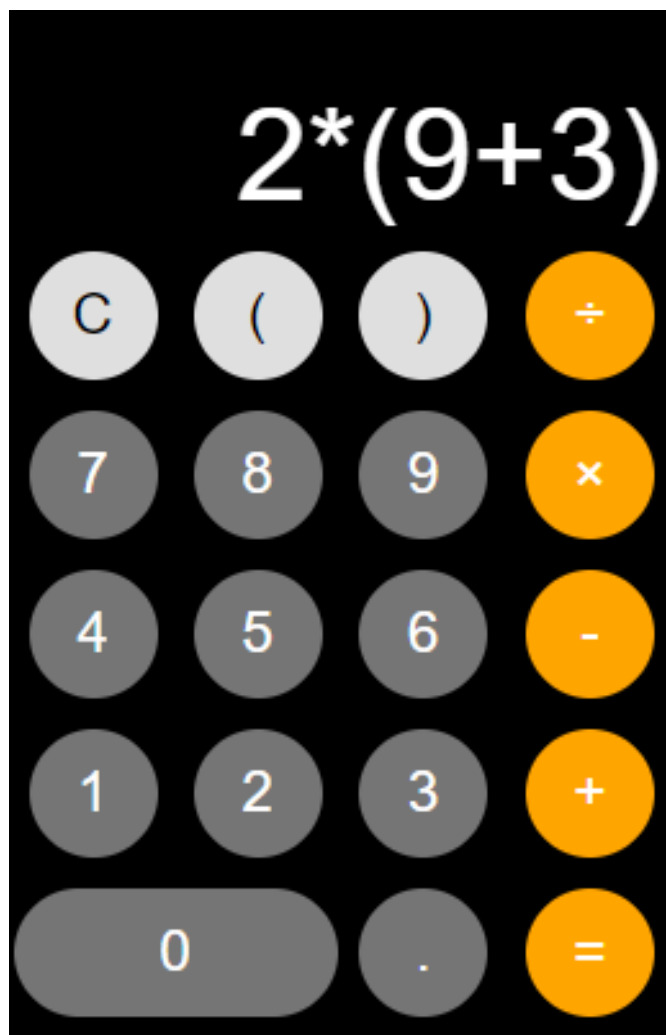
```
document.getElementById(id).innerHTML = new HTML;
```

- Change the value of an **attribute**.

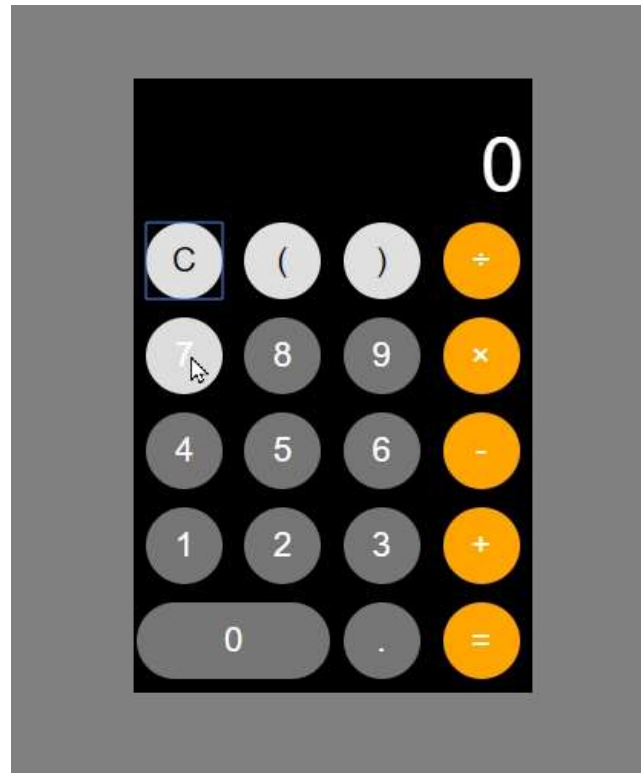
```
document.getElementById(id).src = "example.jpg";
```



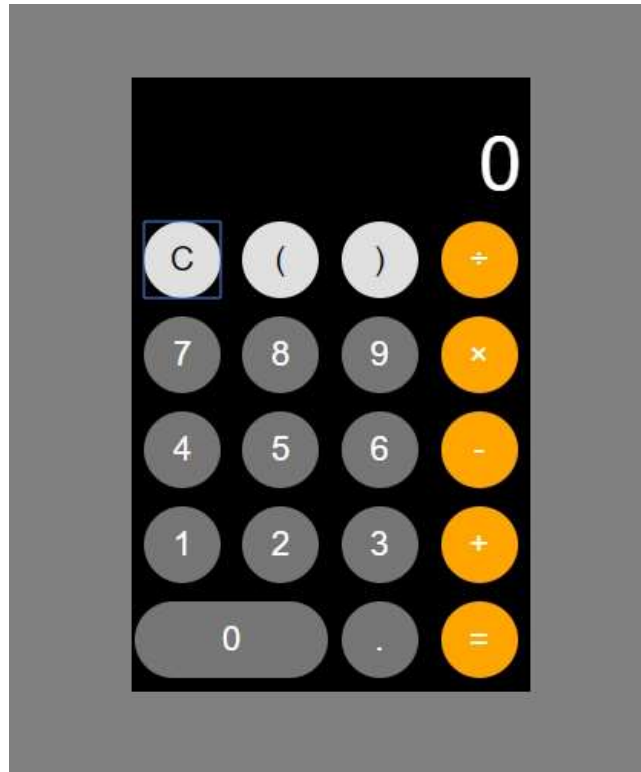
Web calculator



Goal example



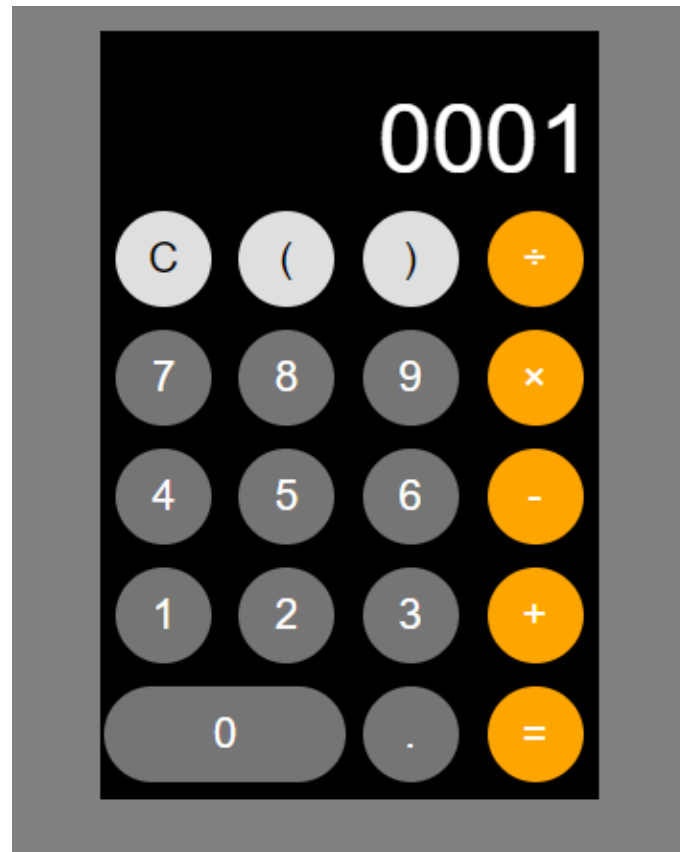
Keyboard and backspace



1 2 3 + 4 5 6 Backspace Backspace



This is not acceptable



Ex. $001+001$, $1+01$, $00+000\dots$



Calculator needs reset



Goal

- **Fork** the repo to your local repository.
- Complete the web calculator.
 - Display input sequence on calculator's screen, and when a “=” is clicked or **Enter** is pressed, show the evaluate result.
 - If the input sequence is an illegal argument, show the error message. (ex. $3+/5$)
- **Deadline: 2024/03/19 17:20**



Grading Policy

Item	Score
Correct evaluated result(include floating point)	30%
Show “error” on the screen when input is illegal	20%
Mouse click the input button work properly	15%
Keyboard type in work properly. 1. Only numeric keypad is necessary, including 1~9, /, *, -, +, Enter 2. Enter will show the evaluate result	10%
Implement backspace by keyboard	10%
Calculator needs reset after press Enter or “=”	10%
Solve the multiple 0 problem (this may take time!)	5%



Hints

- **Trace the HTML code first!** All you have to do is within **html** and **javascript** code.
- Use [onclick](#) and [onkeydown](#) event handler to pass value to JavaScript.
- When passing the input value '×' and '÷', you can directly pass '*' and '/' into the function.
- Use **getElementbyID** to get input text element.
- Make use of [eval\(\)](#) function.
- The [try and catch](#) statements can help you easily handle illegal argument.
 - What does eval() function return, when it is illegal?
- Use global variable to record whether to reset calculator

