

1.7 Introduction to JavaScript

Button click example

JavaScript is a programming language that runs in a browser, enabling webpages supporting actions like responding to a button click. JavaScript can be included in the HTML file's head or body parts.

PARTICIPATION ACTIVITY

1.7.1: JavaScript to change colors.



Click the buttons. Try adding a third button for "blue".

```
10 }
11 p {
12     font-family: arial;
13     margin-left: 10px;
14 }
15 strong {
16     background-color: lightgreen;
17     padding: 5px;
18 }
19 </style>
20 </head>
21 <body>
22     <h1 id="bike-heading">Ducati Streetfighter - $9000</h1>
23     <p>year: <strong>2012</strong></p>
24     <p>make and model: <strong>Ducati Streetfighter 848</st
25     <p>condition: <strong>excellent</strong></p>
```

Render webpage

Reset code

Your webpage

Ducati Streetfighter - \$9000

year: **2012**

make and model: **Ducati Streetfighter 848**

condition: **excellent**

odometer: **9500**

Change heading color to:

▼ View solution

--- START FILE: HTML ---

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <title>For sale: 2012 Ducati Streetfighter</title>
    <meta charset="UTF-8">
    <style>
      h1 {
        color: green;
        background-color: lightgray;
      }
      p {
        font-family: arial;
        margin-left: 10px;
      }
      strong {
        background-color: lightgreen;
        padding: 5px;
      }
    </style>
  </head>
  <body>
    <h1 id="bike-heading">Ducati Streetfighter -
$9000</h1>
    <p>year: <strong>2012</strong></li>
    <p>make and model: <strong>Ducati Streetfighter
848</strong></p>
```

```
<p>condition: <strong>excellent</strong></p>
<p>odometer: <strong>9500</strong></p>

<p>Change heading color to:
  <button id="white-btn">White</button>
  <button id="green-btn">Green</button>
  <button id="blue-btn">Blue</button>
</p>

<script>
  let whiteBtn = document.getElementById("white-
btn");
  whiteBtn.addEventListener("click", function() {
    changeTextColor("white");
  });

  let greenBtn = document.getElementById("green-
btn");
  greenBtn.addEventListener("click", function() {
    changeTextColor("green");
  });

  let blueBtn = document.getElementById("blue-btn");
  blueBtn.addEventListener("click", function() {
    changeTextColor("blue");
  });

  function changeTextColor(newColor) {
    let heading = document.getElementById("bike-
heading");
    heading.style.color = newColor;
  }
</script>
</body>
</html>

--- END FILE: HTML ---
```

[Feedback?](#)

In the HTML above:

- The h1 heading has an id of bike-heading. An id attribute identifies an HTML element so JavaScript can manipulate the element. Two button elements are also created, each with a different id.

- The `<script>` tags, located near the end of the HTML, surround the JavaScript code. The code `document.getElementById("idName")` searches the HTML document for and returns an element with `id="idName"`. `whiteBtn`, `greenBtn`, and `heading` are examples of variables. A **variable** stores a value or a link to an element of a webpage. Ex: `whiteBtn` stores the element with `id="white-btn"`.
- The code `buttonVariable.addEventListener("click", function)` specifies code that executes when the button is clicked. Each button calls the function `changeTextColor()` using the value "white" or "green". A JavaScript **function** is a named group of statements that can be executed by referring to that name.
- The `changeTextColor()` function's statements change the `h1`'s color. Assigning the `heading.style.color` with a color like "white" changes the element's CSS, which causes the element's font color to change.

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1.7.2: JavaScript for the button click example.



If unable to drag and drop, refresh the page.

```
<h1 id="bike-heading">
```

Gives the `h1` heading a label, so that a function can find the heading to change the heading's color.

Any HTML element can be given an id, such as an `h1`, `p`, or `button`.

Correct

```
changeTextColor("white")
```

Indicates that the JavaScript function `changeTextColor()` should be executed, with the value "white".

Various functions can be called. Try replacing `changeTextColor("white")` with `alert("Hello")`, and see what happens. `alert()` is a built-in JavaScript function.

Correct

```
heading =  
document.getElementById("bike-  
heading")
```

Finds the element with id `bike-heading`, and sets `heading` to that element. `heading` can then be used to change the element's attributes, like `color`.

Correct

`document.getElementById()` is a built-in JavaScript function to find HTML elements, so the elements can be updated.

```
<button id="blue-  
btn">Blue</button>
```

The HTML that should be added to create a third button.

That HTML can be placed just below the other button elements. Then the following JavaScript must be added to change the text color to blue when the Blue button is clicked:

```
let blueBtn =  
document.getElementById("blue-  
btn");  
blueBtn.addEventListener("click",  
function() {  
    changeTextColor("blue");  
});
```

Reset

[Feedback?](#)

If-else statement example

The JavaScript example below shows a function with an "if-else" statement for setting the color of the rating stars based on the value passed to the `updateRating()` function. The HTML below defines five span elements, which are inline containers used to manage HTML content. Each span element has a unique id and contains a single * for the rating star. The JavaScript code can change each rating star's color by changing the span's color.

PARTICIPATION ACTIVITY

1.7.3: Updating user ratings.



Click the buttons. Try adding two more buttons for ratings 2 and 1. Try replacing the * with a star (★). To specify a star, use `★`, which is the HTML entity for displaying a star.

```
1 <!DOCTYPE html>
2 <html lang="en">
3   <head>
4     <meta charset="UTF-8">
5     <title>Kyoto Kaiseki Restaurant Review</title>
6     <style>
7       h1 {
8         background-color: lightgreen;
9         color: rgb(40,40,40);
10      }
11      p {
12        font-family: arial;
13        margin-left: 10px;
14      }
15      img {
16        margin-left: 10px;
```

[Render webpage](#)[Reset code](#)

Your webpage

Kyoto Kaiseki Restaurant Review

Rating: * * * * *

Update rating:

Favorite dish: Mixed sashimi



▼ View solution

--- START FILE: HTML ---

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8">
    <title>Kyoto Kaiseki Restaurant Review</title>
    <style>
      h1 {
        font-size: 16pt;
        background-color: lightgreen;
```

```
        color: rgb(40,40,40);
    }
    p {
        font-size: 12pt;
        font-family: arial;
        margin-left: 10px;
    }
    img {
        margin-left: 10px;
    }
    strong {
        color: rgb(100,100,100);
    }
    em {
        color: darkblue;
    }
    span {
        color: blue;
    }
</style>
</head>
<body>
    <h1>Kyoto Kaiseki Restaurant Review</h1>
    <p><strong>Rating:</strong>
        <span id="rating1">*</span>
        <span id="rating2">*</span>
        <span id="rating3">*</span>
        <span id="rating4">*</span>
        <span id="rating5">*</span>
    </p>

    <p><strong>Update rating:</strong>
        <button id="rate1Btn">Rate 1</button>
        <button id="rate2Btn">Rate 2</button>
        <button id="rate3Btn">Rate 3</button>
        <button id="rate4Btn">Rate 4</button>
        <button id="rate5Btn">Rate 5</button>
    </p>

    <p><strong>Favorite dish:</strong> Mixed sashimi</p>

    <img
src="https://resources.zybooks.com/WebProgramming/kyotov1.jpg

    <p><strong>Review:</strong> The kaiseki meal was
amazing and featured 10 courses.
```

Every course was beautifully and artistically prepared using different seasonal ingredients. The service was some of the best service we've ever had. The restaurant's staff was *amazing*. The restaurant was booked for the evening, but they managed to squeeze us in. And, we ended up in a private dining room.

</p>

<script>

```
    let rate5Button =
document.getElementById("rate5Btn");
    rate5Button.addEventListener("click", function() {
        updateRating(5);
    });

    let rate4Button =
document.getElementById("rate4Btn");
    rate4Button.addEventListener("click", function() {
        updateRating(4);
    });

    let rate3Button =
document.getElementById("rate3Btn");
    rate3Button.addEventListener("click", function() {
        updateRating(3);
    });

    let rate2Button =
document.getElementById("rate2Btn");
    rate2Button.addEventListener("click", function() {
        updateRating(2);
    });

    let rate1Button =
document.getElementById("rate1Btn");
    rate1Button.addEventListener("click", function() {
        updateRating(1);
    });

    function updateRating(newRating) {
        let star1 = document.getElementById("rating1");
        let star2 = document.getElementById("rating2");
        let star3 = document.getElementById("rating3");
        let star4 = document.getElementById("rating4");
        let star5 = document.getElementById("rating5");
```



```
star1.style.color = "blue";
star2.style.color = "blue";
star3.style.color = "blue";
star4.style.color = "blue";
star5.style.color = "blue";

if (newRating == 4) {
    star5.style.color = "lightgray";
}
else if (newRating == 3) {
    star5.style.color = "lightgray";
    star4.style.color = "lightgray";
}
else if (newRating == 2) {
    star5.style.color = "lightgray";
    star4.style.color = "lightgray";
    star3.style.color = "lightgray";
}
else if (newRating == 1) {
    star5.style.color = "lightgray";
    star4.style.color = "lightgray";
    star3.style.color = "lightgray";
    star2.style.color = "lightgray";
}
}
</script>
</body>
</html>

--- END FILE: HTML ---
```

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1.7.4: JavaScript for updating user ratings.



Refer to the JavaScript example above

- 1) What is the id of the span containing the third rating star?

**Correct**

Each rating star's span has a unique id. rating1 for the first star, rating2 for the second, rating3 for third, and

Check**Show answer**

so on.

- 2) If the user clicks the "Rate 4" button, to what color is the fourth rating star set?

Check**Show answer****Correct**

blue

If the rating is 4, the first four rating stars will be blue, and the fifth star is set to light gray.

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Drawing graphics example

More advanced interactive webpages, such as a user-entry form or a browser-based video game, may involve hundreds or thousands of JavaScript statements. JavaScript programs are thus commonly placed in a separate file, typically ending in .js, and linked to in an HTML file's head part.

Here is the popular game Tetris, written in JavaScript: [Tetris](#).

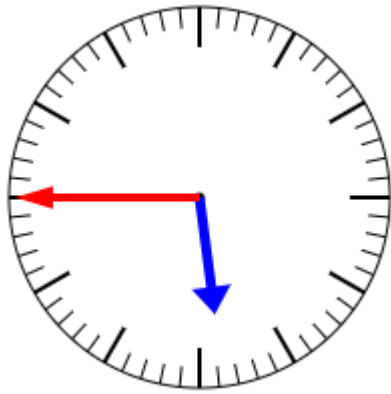
JavaScript example: Analog clock.

JavaScript can also be used to draw graphics. Play around with the clock below by changing the time. Note: No changes are needed.

```
2 <html lang="en">
3 <head>
4   <meta charset="UTF-8">
5   <title>Analog Clock</title>
6   <style>
7     .hour-input {
8       color: blue;
9       margin-right: 5px;
10      width: 30px;
11    }
12
13    .minute-input {
14      color: red;
15      margin-left: 5px;
16      width: 30px;
17  }
```

Render webpage**Reset code**

Your webpage

Time: : [Feedback?](#)PARTICIPATION
ACTIVITY

1.7.5: JavaScript clock example.



Refer to the clock example above.

- 1) The clock does not change unless a button is clicked.

☐ True
☒ False

Correct

The clock changes to the current time if the "Draw current time" button is clicked, but the clock also changes when a different minute or hour is typed.



- 2) In what tag does the JavaScript code appear in the HTML?

☐ <style>
☒ <script>

Correct

The `<script>` tag contains all the JavaScript code. The JavaScript may optionally be placed in a separate file and linked to the HTML file with a `<script>` tag.



- 3) The JavaScript draws the clock inside what tag?

☒ <canvas>
☐ <input>

Correct

A `<canvas>` tag creates a rectangular area within a webpage where JavaScript can draw lines, shapes, and text.

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this

section?



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