

COMP 2015

Introduction to JavaScript and jQuery

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Timers

All animation in JavaScript is done using **timers**. There are several timer methods available, but we will focus on three: `setTimeout()`, `setInterval()`, and `clearInterval()`.

setTimeout

The `setTimeout` method calls a JavaScript statement after waiting for a specified number of milliseconds. Often the “JavaScript statement” is a function that you created, but it can also be any JavaScript code. Here are a few examples:

Using a string of JavaScript code:

```
setTimeout("alert('time is up!')", 3000);
```

Using a named function:

```
function timeIsUp() {  
    console.log('time is up!');  
}  
  
setTimeout(timeIsUp, 1000);
```

Using an anonymous function:

```
setTimeout(function() {  
    alert('time is up!');  
}, 5000);
```

setInterval

Like `setTimeout`, the `setInterval` method waits *x* milliseconds before executing. Unlike `setTimeout`, which runs only once, `setInterval` runs every *x* milliseconds until it is explicitly stopped.

example:

```
var timerId = setInterval(function() {  
    alert('Hello!') // alerts 'Hello' to the user every 4 seconds  
}, 4000);
```

example:

```
var timerId;  
  
timerId = setInterval("alert('Hi!')", 100);
```

In all the examples of `setInterval`, we have created a *timer variable* called *timerId*. We can use the `timerId` variable to ensure that we are not creating multiple timers (which may lead to memory leaks), but more importantly we can use the variable to stop a repeating section of code started with `setInterval`. To stop a repeating section of code started with `setInterval`, use the `clearInterval` method and give it a reference to the timer variable you have created.

clearInterval

example:

```
var timerId = setInterval(function() {  
    alert('Hello!') // alerts 'Hello' to the user every 4 seconds  
}, 4000);  
  
clearInterval(timerId); // Stops the repeated alerts
```

Finding And Setting The Position Of An Object

In order to animate objects (e.g. images on the page), we need to get and set their position on the screen. We can accomplish this using the `style` object we have seen in Lesson 1.

First, grab the element to be animated and set some important CSS attributes. Without setting these attributes our animation will not work:

```
// e.g.  
var myImage = document.getElementById('img1');  
  
myImage.setAttribute('style', 'position: absolute; top: 0; left: 0');
```

If we want to move the image from left to right, we can *get* the left position using the `style.left` property:

```
alert(myImage.style.left); // returns a STRING, e.g. "0px"
```

By repeatedly incrementing the left position, we can move the image from left to right, but first we need to parse the number out of the string that `style.left` returns:

```
parseInt(myImage.style.left); // returns a number, e.g. 0
```

Now we can increment the value, and convert it back to a string so that `style.left` understands it:

```
parseInt(myImage.style.left) + 1 + 'px';
```

and finally *set* the property on our object:

```
myImage.style.left = parseInt(myImage.style.left) + 1 + 'px';
```

Example Animation Code

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Document</title>
</head>
<body>
  
  <script>
    var timerId = null;

    var myImage = document.getElementById('img1');
    myImage.setAttribute('style', 'position: absolute; top: 0; left: 0;');
    myImage.onclick = startAnimation;

    function startAnimation() {
      if (timerId == null) {
        timerId = setInterval("animate()", 2000);
      }
      else {
        clearInterval(timerId);
        timerId = null;
      }
    }

    function animate() {
      myImage.style.left = parseInt(myImage.style.left) + 1 + 'px';
    }

  </script>
</body>
```

Next Week

Lab 4 due before the beginning of Lesson 5.

Download it from our course section of COMP2015 on D2L <http://learn.bcit.ca> (COMP2015 > Content > Lesson 4)

Quiz 4 at the beginning of Lesson 5.

Quiz topics can also be found on D2L under COMP2015 > Content > Lesson 4