Using `setTimeout()` instead of`setInterval()`

INTRODUCTION

One thing you should always remember about using `setInterval`: if we set number of milliseconds at - let's say 20ms, it will call our game loop function EACH 20ms, *even if the previous one is not yet finished*. This may lead to lots of problems (incomplete rendering, etc.).

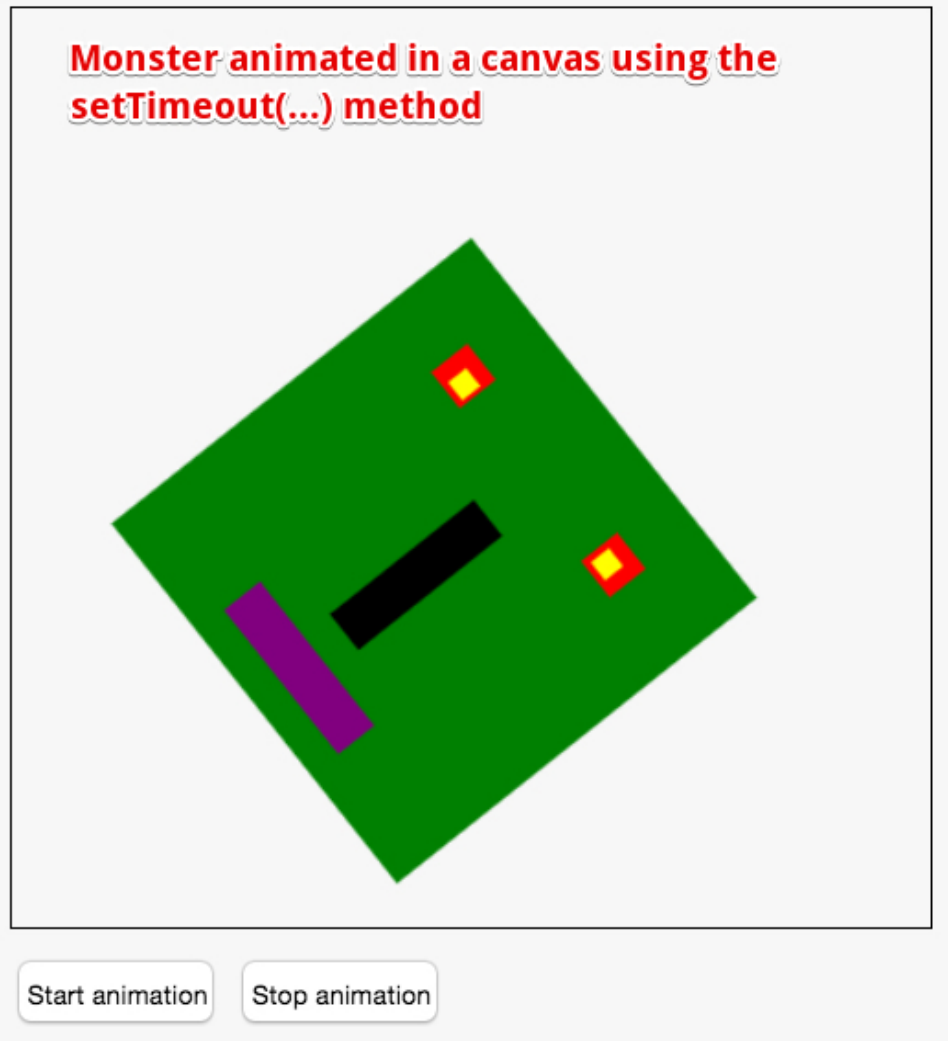
That's where we can use another function:

- Syntax: `setTimeout(function, ms);`

This function works like `setInterval(...)` with one difference: it calls your function ONCE and *AFTER a given amount of time*.

EXAMPLE OF THE MONSTER ANIMATED IN A CANVAS WITH`SETTIMEOUT`

Example of use: http://jsbin.com/timebu/3/edit (open the JavaScript, console and output tabs).



This is similar to the previous example except that we called `setTimeout(function, delay)` instead of `setInterval(function, period)`. **As `setTimeout` runs the function passed as the first parameter only once, we have to call it also at the end of the loop**.

Extract from source code:

```
function animationLoop() {
  // 1 - Clear
  ctx.clearRect(0, 0, canvas.width, canvas.height);
  // 2 Draw
  drawMonster(monsterX, monsterY, monsterAngle, 'green', 'yellow');
  // 3 Move
  monsterX += 10;
  monsterX %= canvas.width
  monsterAngle+= 0.01;
  // call again mainloop after 20ms
  requestId = setTimeout(animationLoop, 20);
```

```
}

function start() {
  // Start the animation loop, change 20 for bigger
  // values
  requestId = setTimeout(animationLoop, 20);
}
function stop() {
  if (requestId) {
     clearTimeout(requestId);
  }
}
```

This function is certainly more suitable for doing graphic animation, such as for writing an HTML5 game. It will never interrupt an ongoing animation, even if the instructions inside the animation loop take too long.

PROBLEMS WITH `SETINTERVAL()` AND `SETTIMEOUT()`

`setTimeout` does not "wait" during the timeout period. It lets the rest of the JavaScript code run. It schedules a new call to the function passed as first parameter with a timer running in the background. This might cause it to take slightly longer than the expected timeout period to start executing.

This problem also occurs with `setInterval`, the timing is not "very" reliable. If you plan to run a function every 20ms, and if you measure precisely the real timing, sometimes you will discover big differences between what is scheduled and what is performed. This is because these methods have been designed a long time ago, when high precision timers and 60 frames per second animation were not an option.

Here comes the requestAnimationFrame API, a very good companion to the canvas API!

***BEST PRACTICE**: AVOID using `setTimeout` for animating in a canvas, except for trivial cases.*

For 60 frames/second animation, use `requestAnimationFrame`!

KNOWLEDGE CHECK 4.2.4 (NOT GRADED)

```
setInterval(function, milliseconds);

setTimeout(function, milliseconds);
```

What is true about the two lines of code above?

- They will produce the same result: call the function passed as first parameter every interval of time passed as the second parameter (in milliseconds)
- setTimeout will call the function only once, after a delay corresponding to the value passed as second parameter.