Animation Frames

In this exercise we will use requestAnimationFrame() to animate a ball moving around the canvas.

Exercises

1. In ball.html, resize the canvas and put a border around it so that we can see its edges.
2. Add your name as a <h1> tag to the html file (above the canvas)
3. Clear the entire canvas at each step of the animation, so that only one copy of the ball is visible at a time. You can use the clearRect method for this.

   ```
   ctx.clearRect(left, top, width, height);
   ```

4. Stop the ball moving when it hits the bottom of the canvas. You might use an if statement for this purpose.

```
// If the ball hits the bottom of the canvas.
if (...) {
  // Stop the ball.
  ...
   }
```

5. Represent the ball as a class/object (that includes attributes such as x & y position, x & y velocity, radius etc. and methods such as draw, move, resize) – see:

   1. The move function should increments the xpos and ypos co-ordinates of the ball by the x and y velocities.
   2. The draw function should take no arguments but should draw the ball according to the xpos, ypos, r object parameter settings

   https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Classes#Static_methods

6. Change the code so that the ball starts moving up the way once it reaches the bottom of the screen.

   ```
   // If the ball hits the bottom of the canvas.
   if (...) {
     // Change ball's direction. (reverse the speed)
     ...
   }
   ```

7. Change the code so that the ball bounces from the bottom to the top of the screen, and back again, repeatedly.

```
// If the ball hits the bottom of the canvas.
if (...) {
  // Reverse the ball's speed.
  ...
}
// Otherwise, if the ball hits the top.
else if (...) {
  // Reverse the ball the other way.
}
```

8. Give the ball a horizontal velocity, as well as a vertical one, and have it bounce off the left and right sides of the canvas also.

Advanced exercises

1. Add to the ball class so that the ball now looks like the Pokemon symbol (using cartesian to polar conversion). Redefine the move, draw and resize methods for the new object and demonstrate their functionality. Include comments in your code to describe your thought process.

2. Add a rotate method (that rotates the symbol by a certain number of degrees/radians). This will give the illusion that that it is rolling when animated. Reverse the direction of the rotation when the object strikes the wall

Notes

- See here for Mozilla's docs on Window.requestAnimationFrame().