School of Computing and Mathematical Sciences

COMP 1589
Tutorial 9

Loops in JavaScript

Introduction

In this week's lecture you were told about loops in JavaScript. In this tutorial you will explore these concepts by creating some simple programs that use the HTML Canvas

Task 1: "Art Balling" Generator

" Former England cricket captain Michael Vaughan has found a new use for that pull shot: whacking paint-daubed balls at canvas to produce highly collectable works of art. Watch out, abstract expressionism - here comes 'artballing'" –

The following code is the "skeleton" for a program that will generate a very simple version of a Michael Vaughan painting using a combination of functions and loops. You were shown the completed code during the lecture.

```
    <canvas id="sCanvas" width="550" height="400"></canvas>
<script>
// Art Balling Generator 550px x 400px // Using Loops
// Variables
var randomColour;
var randomSize;
var xPos;
var yPos;
var i; // counter
var j; // counter
// Get the Canvas element with ID sCanvas that will be drawn on
c = document.getElementById("sCanvas");
ctx = c.getContext("2d");

function drawFilledCircle(size,xPos,yPos,colour){
    ctx.beginPath();
    ctx.arc(xPos,yPos,size,0,2*Math.PI);
    ctx.fillStyle = colour;
    ctx.fill();
}

function drawSplatter(size,xPos,yPos,colour){
    for(j=0;j<10;j++){
        var splatSize = size / Math.round(Math.random()*30);
        drawFilledCircle(splatSize,xPos + Math.round(Math.random()*50),yPos + Math.round(Math.random()*50),colour);
    }
}

</script>
```

This will not currently run as it requires code that utilises the given functions. Spend time first of all trying to understand what the 2 functions will do. You will notice that the drawFilledCircle function is very similar to the function you used in the last tutorial to create coloured squares. The drawSplatter function utilises a loop to draw 10 circles of random shapes and positions dependent on 4 parameters (size,xPos,yPos,colour) passed to the function.

Calling the functions in a loop

The following code can be used to create one “normal circle” and one “circle splatter”. Insert it around line 37 before the closing script tag.

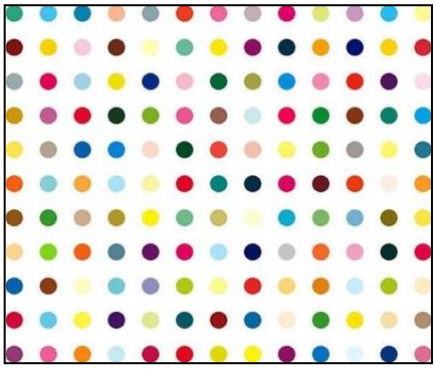
```
randomSize = Math.round(Math.random()*50);
xPos = Math.round(Math.random()*550);
yPos = Math.round(Math.random()*400);
randomColour = '#' + Math.random().toString(16).substring(2, 8);
drawFilledCircle(randomSize, xPos, yPos, randomColour);
drawSplatter(randomSize, xPos, yPos, randomColour);
```

Your task is to take the above code and using either a for loop or a while loop, draw 10 “normal circles” and “circle splatters”. Once you have done this modify your code so that it produces a random number of “normal circles” and “circle splatters” between 1 and 20.

Random colour optional method

randomColour = "hsl("+ 360*Math.random() + ",50%,50%)";

Task 2: “Spot” Generator



“Damien Steven Hirst is an English artist and the most prominent member of the group known as "Young British Artists" (or YBAs), who dominated the art scene in Britain during the 1990s” … “Hirst's best known works are his paintings, medicine cabinet sculptures, and glass tank installations. For the most part, his paintings have taken on two styles. One is an arrangement of color spots with titles that refer to pharmaceutical chemicals, known as Spot paintings. ”

```
    <body>
  <canvas id="sCanvas" width="550" height="550"></canvas>
<script type="text/javascript">

// Spot Painting Generator 550px x 550px
    // Variables
    var randomColour;
    var xPos;
    var yPos;
    var i; // counter
    var j; // counter
    var c; // canvas element
    var ctx;

    // draw a circle with a specfied size, position and colour
    function drawCircle(size,x,y,colour){
        ctx.beginPath();
        ctx.arc(x,y,size/2,0,Math.PI*2,true);
        ctx.fillStyle = colour;
        ctx.fill();
    }

    // Get the Canvas element with ID sCanvas that will be drawn on
    c = document.getElementById("sCanvas");
    ctx = c.getContext("2d");

    // Starting y position
    yPos = 30;

        // Starting x position
        xPos = 30;

       // Inner loop for 9 columns
       for(j=0;j<9;j++){
           // Generate random colour
           randomColour = '#' + Math.random().toString(16).substring(2, 8);
           drawCircle(30, xPos, yPos, randomColour);
           xPos += 50;
       }
       yPos += 50;

</script>
```

The above code is the “skeleton” for a program that will generate a very simple version of a Damien Hirst Spot painting using a combination of functions and loops. You were shown the completed code during the lecture.

When you run this code you will notice that only one line of 9 horizontal “spots” appears. Your task is to use a nested loop to produce the full painting, which is comprised of 9 horizontal “spots” and9 vertical “spots”.
You can do this by creating another for loop, which surrounds the current for loop (and xPos = 30 assignment) and uses a counter called i.