Introduction to the HTML5 Canvas

In this exercise, we will create an image using HTML canvas tags and the JavaScript canvas API.

Exercises

Note: Do **not** host the lab solution on a Public **Github Account**

Week 1

1. Below is an example of the typical layout of a HTML file. In Moodle, the file canvas.html has a similar layout. Download the file to a folder called "GraphicsAssignment1" and open in Notepad++ (or a text editor of your choosing)

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="UTF-8">
    <title></title>
    <style type="text/css">
      ...
    </style>
  </head>
  <body>
    ...
    <script type="text/javascript"></script>
  </body>
</html>
```

2. Open canvas.html in Chrome, and open the JavaScript console to monitor errors.

3. Draw a black border around the canvas, using CSS.

```
canvas {
  border: ...
}
```

4. Change the size of the canvas to enlarge it. Make sure to change the canvas size in either the HTML or JavaScript (but not the CSS).

5. Add you name as text to the canvas. Consult the JS Canvas API to achieve this

6. The following line changes the fill colour of the context to red. Change canvas.html to make the rectangle another colour of your choosing.

```
// Set the fill colour to bright red.
ctx.fillStyle = "rgb(255, 0, 0)";
```

7. The fillRect method takes four arguments, as below. Change the dimensions of the square in canvas.html to change it to a rectangle. (You may need to consult API docs to do this)

```
ctx.fillRect(a, b, c, d);
```

8. Modify the HTML file to draw a triangle of a different colour.

9. Instead of using RGB to set colour values, we can use RGBA to also use an alpha channel, as below. Add some transparency (40%) to the shapes. Note: Ensure that the shapes are partially overlapping (so that the transparency is visible)

10. Add two circles of 2 different colours to canvas.html

11. For each of the shapes above, make sure that the outline of the shape is different to the fill colour. Look at the API documentation, in particular the ".stroke()" method to achieve this.

Week 2

12. Draw a Pacman on the screen using Cartesian to polar coordinates

13. Encapsulate the Pacman within a Pacman class with a constructor and draw method and the following parameters

    - Centre x position
    - Centre y position
    - Radius
    - Facing left/right (Boolean variable)

14. Create 2 Pacman objects of different sizes and draw them on the screen (facing opposite directions)

15. Draw a beachball with 7 segments. Encapsulate the beachball within a class containing a constructor, draw, move and resize method.
16. Create a single beachball object and redraw it in 3 different sizes and positions.
17. Display all of the above on a single canvas
18. Post a snip of your final image to the Moodle Forum for grading.
19. Feel free to use some artistic licence.