Animation: Particles and Flocking

Aim: Use JS to programme some simple particle and flocking systems

Preparatory work

1. Open the folder (eg **WebMM)** that you were working in for the previous multimedia practicals, and now open **MManim.html** in a browser.
2. This file is a continuation of the MMapp from the previous HTML practicals, but now has two new tabs: Particles and Flocking. Give them a try.
3. Now open **MManim.html** in an IDE for editing.

Particle system

This simple particle system is repeatedly firing a set of coloured balls from the bottom of the window in random directions. The balls do not interact with each other. The basic code is an extension of the "JS Anim" ball animation.

4. Examine the code and try to figure out what it is doing.
5. When you are ready, try changing it to do different things e.g. the number of balls, the direction they can go, the speed they travel at (could make this different for each ball).
6. One challenging change you could try to make would be to add gravity to each ball, so that they are pulled downwards by the gravitational force.

Flocking system

Now, in this smaller group of balls, one ball is a leader on a predefined course. The other balls start off in random directions but are given instructions to "follow the leader", which they quickly do.

7. Again, try to understand the code, before attempting to change it.
8. You can try changing the number of "following" balls and their speed.
9. Add two further variables that specify the x and y coordinates of our "ball" object that we are going to animate, giving both variables the initial value of 50.
10. Challenging changes include:
    a. Add rules so that the "following" balls cannot overlap each other and so form a more sensible "flock"
    b. Have more than one leader with "following" balls initially choosing which leader to follow and end up forming separate flocks for each leader.