Exercise – Flocking

In this exercise we’ll be implementing 3 new steering forces to implement Flocking.

Exercise 1:

Based on the lecture notes, implement a **Separation** force:

separateForce = zero

for each gameObject b in neighbourhood

separateForce += agent.position – b.position

// average separation force

separateForce /= neighbourhood.size

forceToApply = (separateForce – agent.velocity) \* separateWeight

Exercise 2:

Based on the lecture notes, implement an Alignment force:

alignForce = zero

for each gameObject b in neighbourhood

alignForce += b.velocity

// average align force

alignForce /= neighbourhood.size

forceToApply = (alignForce – agent.velocity) \* alignWeight

Exercise 3:

Based on the lecture notes, implement a Cohesion force:

cohesionForce = zero

for each gameObject b in neighbourhood

cohesionForce += b.position – agent.position

// average separation force

cohesionForce /= neighbourhood.size

forceToApply = (cohesionForce – agent.velocity) \* cohesionWeight

Exercise 4:

Create an application that demonstrates Flocking.

* Your GameObject’s should use a ‘neighbourhoodRadius’ value and the ability to know about other game objects within that area around itself.
* Try including a wander force in their behaviour to make them change direction a little more.

Challenge Exercise:

1. Implement a Leader who exerts more influence over other nearby GameObjects.
   1. Make the Leader controllable via keyboard input and enjoy steering your swarm around!
2. Add collision avoidance to their behaviour so that they don’t move though physical objects in their environment.