Exercise – Flocking – Part 2

In this exercise we'll be implementing *Formations* and *Reciprocal Collision Avoidance.*

FORMATIONS

Exercise 1:

Based on the lecture notes, Implement a FormationAgent that derives from Agent. The FormationAgent will update the Agent's target position and then allow the base Agent to run IBehaviors that move it towards that location. Feel free to research alternative formation solutions.

```
FormationAgent : Agent
{
    squadMates = null
    leader = null
    isLeader = false
    offset = Vector2(0,0)

    Initialise(squadMates, isLeader)
    {
        this.squadMates = squadMates
        this.isLeader = isLeader

        if(!this.isLeader)
        {
            this.leader = //find leader agent from squadMates
            //provided squad members are initialised in formation
            offset = this.leader.position - base.position
        }
    }

    override Update()
    {
        if(this.isLeader)
        {
            //normal update using base.targetPosition or user input, etc
            base.Update()
        }
        else
        {
            //transform offset by leader's current transform
            base.targetPosition = leader.transform * offset
            base.Update()
        }
    }
}
```


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CROWD SIMULATION

Exercise 2 (challenging):

Create a CrowdAgent that derives from Agent. The CrowdAgent will override the Agent's Update method so that it may constrain the final velocity before it is applied to the Agent's position.

```
CrowdAgent : Agent
{
	override Update()
	{
		steeringForce = //business as usual, recommend use of virtual methods
		base.velocity += steeringForce * deltaTime
		base.velocity = ComputeNewVelocity(base.velocity)
		base.position += base.velocity * deltaTime
	}
}
```

Next, download the RVO2 library from: http://gamma.cs.unc.edu/RVO2/downloads/ and integrate it into your project so that your CrowdAgent can make use of it. The main challenge here will be restructuring the library code to suit your project. Alternatively your teacher may give you the source code to the Crowd Demo to reference (written in Unity/C#).

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