10 Chambers Programmer Test

Background

This project is a prototype where we want to investigate simple flocking movement in 3D and how it performs. The prototype proves that flocking movement in 3D creates interesting patterns and is something that we are interested in using. However, it does not prove that this scales well from a performance standpoint.

Prototype Details

- Open the scene called "10C Gameplay Test.unity" and press play to start the existing prototype
- There are three types of agents flying around; red, blue and green, all have slightly different flocking behaviors.
- While in the game view you can press 1, 2, 3 or 4 on your keyboard to reset the simulation with a different number of agents.

The Task

- We want to keep the flocking behavior that the prototype proved interesting, but we need to improve the performance at scale.
- Improve the overall performance of the flocking agents. We want to be able to simulate as many agents as possible while still maintaining a good interactive frame rate.
- We also noticed that we currently have a lot of garbage collection (GC) each frame. Please have a look into that and see if you can eliminate all GC.
- For this optimization we want to avoid using Unity physics. Under normal circumstances we would of course investigate all possible paths to get the desired results, but for the sake of the test we want to keep the focus on the programming.
- The target platform is a modern, multi core PC with a current gen GPU.

Documentation

We want you to write a short documentation containing the following:

- Summary of your performance investigation:
    - Issues that you have identified
    - Your solution to those issues
- Suggestions for potential further performance improvements to try out if you would have gotten to spend more time on it.

Suggestions

- We recommend that you use the Unity profiler to identify frame costs and memory usage / garbage collection
- There is no inherent need to keep the code structure as is since it is a quick prototype, feel free to modify and/or restructure the project in any way you want, as long as the behavior is unaffected.

If you have any questions, we encourage you to reach out and ask, just as you would in a working environment.