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| Student Name: | Shane Conroy | | Student Number: | C00270031 |
| Working Title: | Safe Sheep | | | |
| Description: | My project will be a top-down game where you assume the role of a shepherd accompanied by his sheep dog. You will be in charge of managing a farm of sheep, the sheep will move in a flock formation, like “Egg Inc.” You as the player will have to construct buildings, buy upgrades, and ensure your flock with survive wolf attacks.  The player will walk around to empty lots to buy new buildings. There will be menus to buy upgrade. The sheep will use flocking as to have as much, packed into the farm at once. Ill need to look into optimising as many sheep on screen at once. The sheep will have different behaviours depending on the situation. If a wolf is attacking the sheep will panic and flee everywhere. The shepherd and his sheep dog will have to keep the sheep safe. The sheep dog will use path finding to navigate the farm, being controlled by mouse click. The objective of the game will be to make as much money as possible and buy upgrades for your farm.  There will be an in game algorithm controlled market place. The player will have to check stocks and buy/sell in the right place for maximum profits. There will be many different buildings the player will need. Barns, Wool processing plants, pastures, etc.  Another thing I want to implement is realistic behaviours for wolf attacks. In real life the older sheep would move to the outside of the herd and the lambs would move to the inside. I want to try replicate this with Machine Learning based off a reward model. The model will minus more points based on what dies. Old sheep will -1, mature sheep will -2 and lambs will -3. Hopefully this will achieve the desired effect of lambs hiding behind older sheep. Wolves will also have this behaviours but reversed, chasing lambs more.  References:  Mobile game “Egg Inc.” | | | |
| Reasons for selecting project: | | The game’s core mechanic will revolve around flocking techniques with Ai and I’d like to see how many npcs I can have active at once without crashes or lagging by using proper techniques. | | |
| Proposed research content: | | Flocking. Ai behaviours. Efficiently instantiating many npcs at once. Path-finding. Multi-threaded Processing. Machine Learning. Ai reward model behaviour. | | |
| External links (if applicable): | |  | | |
| Hardware requirements: | |  | | |
| Software requirements: | |  | | |
| Other requirements: | |  | | |

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| Signed: | | Date: |
| **For Office Use Only** | | |
| Approved/Not  Approved: | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| Reasons for not approving project: |  | |
| Conditions attached to approving project: |  | |
| Approved/Not Approved: | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| Name of Supervisor: |  | |
| Signed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |