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Class: CPSC 481-01
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GROUP FINAL REPORT ON SPACE SHOOTER GAME

1. Summary of project completion.

This report will contain all the necessary information regards to the completion of the our game, such as specification of our contribution in the code, contribution for each individual in our team and final work done.

For the final step, which lead us to the completion of our project, we made our perceptron network embedded in the game we built. To make our game more interested, we made our reflect agent to become more interactive by using a training data set with the perceptron network. The purpose of this was so in case of a dangerous situation such as if the agent is about to get hit by an enemy spaceship, the player can draw a saving symbol to clear out enemy, make a shield to protect A.I or perform a spread shooting that will help player's spaceship from dying. Furthermore, we added a new feature called Training that allows player to choose his or her own 3 symbols to train the AI. So, every time player is playing this game. He or she does not require to follow one of 3 default symbols created. Actually, player can be creative and make their own saving symbols.

2. Contribution from the code:

Most of the part of our code was done using our own ideas and own code. There were some parts of our code that we actually got it from Unity Tutorial website (l). Basically, you got the assets and original code of the game from the Unity. However, we modified almost 80 -85% of the code and add our own scripts which are:

- DrawCanvasScript
- DrawCellScript
- InGameNN
- Ptron
- ShieldScript
- StartTrain
- Swarm_Controller (protocol but not used)
- Swarm_Mover (protocol but not used)
- TrainSetScript
- Weights

Also, the prefabs/assets that we created include:

- DrawCanvas
- DrawCell
- gridCell
- Perceptron
- Player_shield

- TrainSet

The scripts that we modified are all the file start with the keyword “Done_”.
The code for our game is runnable using C# and for the AI part was implemented by us 100%. As mentioned in our previous assignment, we decided to use unity and it was approved by the professor. Even though we used unity, we all went over the tutorials in order to have a deep understanding of how to use the platform and its code in order to prevent using external codes and keep our own codes. With that being said, an estimation of 20-25% was used from unity code to help our game work accurately and save us from creating the materials/assets, the machine learning and AI concepts are done by using our own code.
Moreover, for the external library files, we only used Unity library which is mainly for game developer. The following is the list of them:

- UnityEngine
- System.Collection
- System.Collections.Generic
- System.Linq
- System.IO

3. Contribution from each individual in our group:

We all contributed the same amount with our project. We all managed the time to meet at least once or two times a week. In addition, we all used google drive, text messages, and discord to keep each other connected. Over all, we found Discord more helpful as it allowed us to chat online by voice or writing. Discord helped us keep connected by exchanging codes, sharing ideas, and helping out each other outside of school.

a. Hympert Nguyen 100% - responsible for reflect agent and research textbook
b. Luis Cornejo 100% - responsible for implementation of Mutilayer Perceptron Network and reflect agent
c. Thomas Ngo 100% - responsible for testing, optimization and planning
d. Roberto Perez-Mendoza 100% - responsible for documentation and research online

Generally speaking, the personal contribution of every team member is divided equally among our team. Even though, we splitted the specific tasks to each member, we used to help each other in finding solution if one of us was unable to finish. Meaning, if the project is 100% total, each member is derserved equally 25% or ¼ contribution to the team.

4. Conclusion:

As a result, we were able to complete our project before the due date, with all the expectations met. In addition, we had the opportunity to improve our perceptron network to make our game more interesting. As mentioned in the paper, the work has been completed by us using C# and each individual in our group collaborated to successfully complete the project. Therefore, as a team, we think that our baseline score should be around 11 - 12.

Reference links:

1. https://unity3d.com/learn/tutorials/s/space-shooter-tutorial
2. https://www.youtube.com/watch?v=aircAruvnKk
3. https://www.youtube.com/watch?v=IHZwWFHWa-w
4. https://www.youtube.com/watch?v=Ilg3gGewQ5U

5. http://blog.refu.co/?p=931