Snake AI - Zach Bowyer and Jonathan Olderr

For our project, we are going to make an AI that plays the game snake. The high level goal is to make it so the snake can live for as long as possible.

To ensure it lives as long as possible, the snake must learn to not hit the walls, or itself. It also will have a starvation timer to force it to go for food.

The way we plan on implementing this is through a genetic algorithm of neural networks. Essentially, each individual in the population has a genome of the weights and biases of a predefined neural network architecture, which in this case, is going to probably have one input layer, 2-3 hidden layers, and an output layer. The output layer will be a probability distribution of the 4 directions a snake can move, which are 'UP', 'DOWN', "LEFT' and 'RIGHT'. The highest move probability will be chosen.

Some issues is that we don't have a training dataset, so we will have to train via the genetic algorithm, which tends to be slow for these types of problems. We also don't know how we are going to implement back propagation, so that will also slow training.

To get this project to be successful, we will have to think about what a good fitness function will be, what a good network architecture will be, what inputs are good for the network, how large we want our genetic algorithm population, and how much mutation we want.