# Autonomous Computer-Controlled Game Characters

## Game Objective:

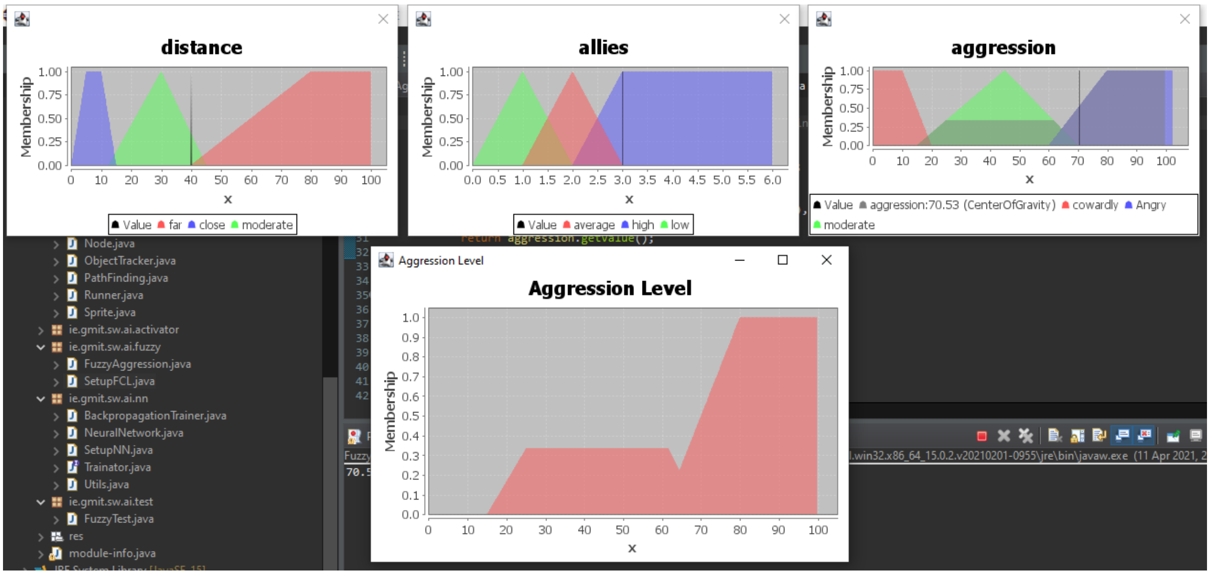
If the player is caught by one of the characters, the game will end.

## Object Tracker:

The positions of the characters and player within the game model are stored in an ArrayList using the **ObjectTracker** class. It will then calculate the distance to the player and the nearby characters.

## Fuzzy Logic Controller:

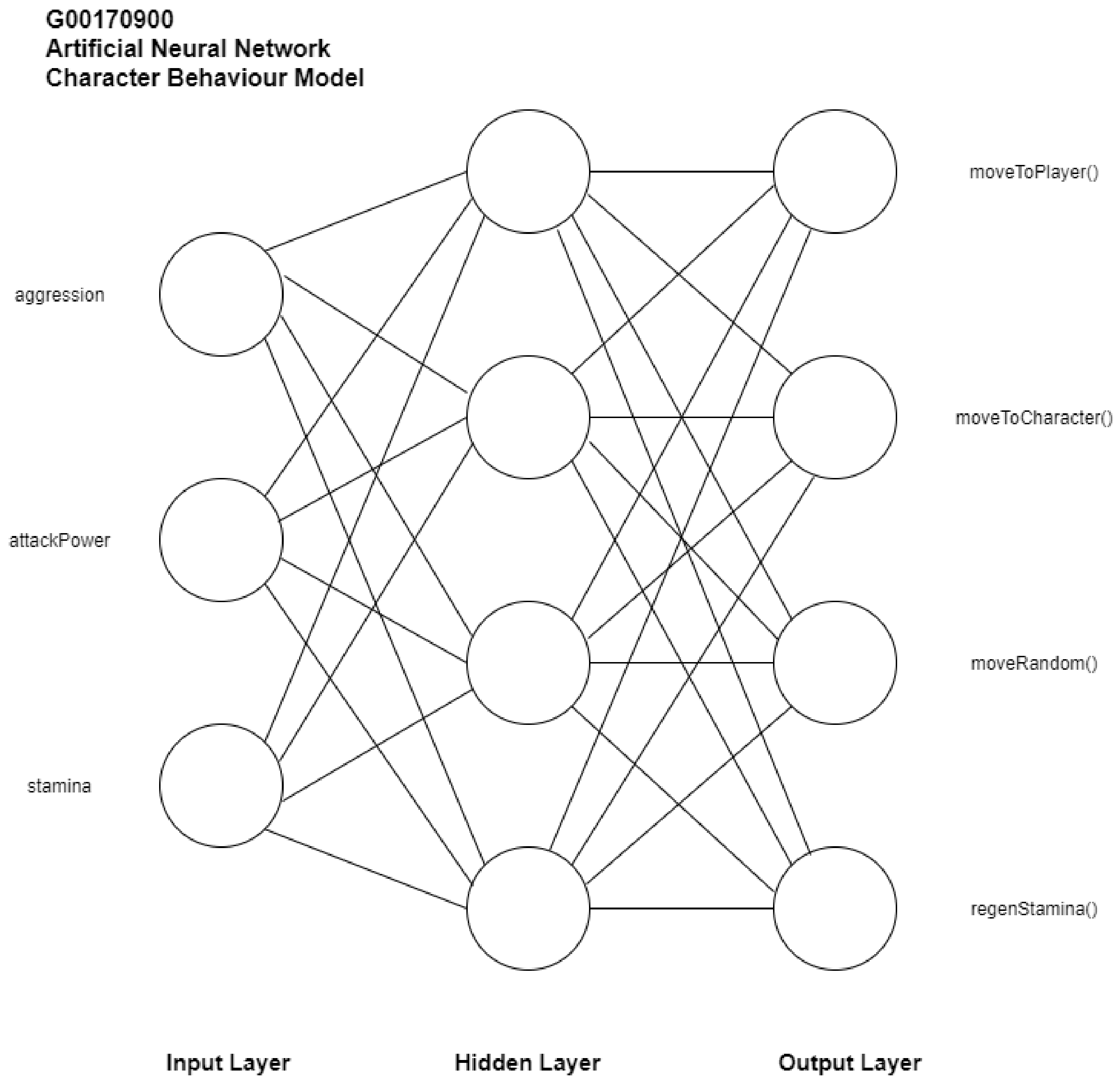
The **FuzzyAggression** class will take in the distance to the player and the number of nearby allies to calculate the aggression level of the respective character. Having the player close the given character or having lots of nearby allies will increase its aggression level. The aggression level for that character is then set in its respective **CharacterStats**.



```
return aggression.getValue();
```

## Neural Network:

Decides which action to take based on the **CharacterStats** of each character. The **CharacterStats** include aggression, which is set by the result of the FCL. The attackPower is set during character creation and does not change. A high attackPower character will be more inclined to chase the player, while low attackPower characters will be more likely to group up with other characters to increase their collective aggression through the FCL. The stamina is set to 5 at the start and will be consumed while chasing the player. Once a character is “tired” it will rest briefly to regen stamina before continuing to chase the player. If the aggression level is low, the character is inclined move randomly.



## Extras – A* PathFinding:

The A* **PathFinding** algorithm works by exploring the paths to the target location and applying an associated cost to each node. The g_cost being the distance between the current node and the starting node. The h_cost being the estimated distance from the current node to the end node. Finally, the f_cost being the combination of the g_cost and h_cost representing the total cost of the respective node. Once the most cost-effective path from the start node to the end node has been established, it will then retrace the path taken and return the list of nodes.