COMP 5660 Fall 2024 Assignment 2c

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1 Green Problem 2c

1.1 Parameters

Parameter	Value
μ	50
Number of Children	50
Mutation Rate	0.20
Parent Selection	k_tournament_with_replacement
Parent Selection k_kwargs	{'k': 5}
Survival Selection	k_tournament_without_replacement
Survival Selection k_kwargs	{'k': 5}
Parsimony Coefficient	1/3
Sample Size	5

Table 1: Ghost Parameters

Parameter	Value
μ	400
Number of Children	200
Mutation Rate	0.60
Parent Selection	k_tournament_with_replacement
Parent Selection k_kwargs	{'k': 100}
Survival Selection	k_tournament_with_replacement
Survival Selection k_kwargs	{'k': 100}
Parsimony Coefficient	1/50
Sample Size	5

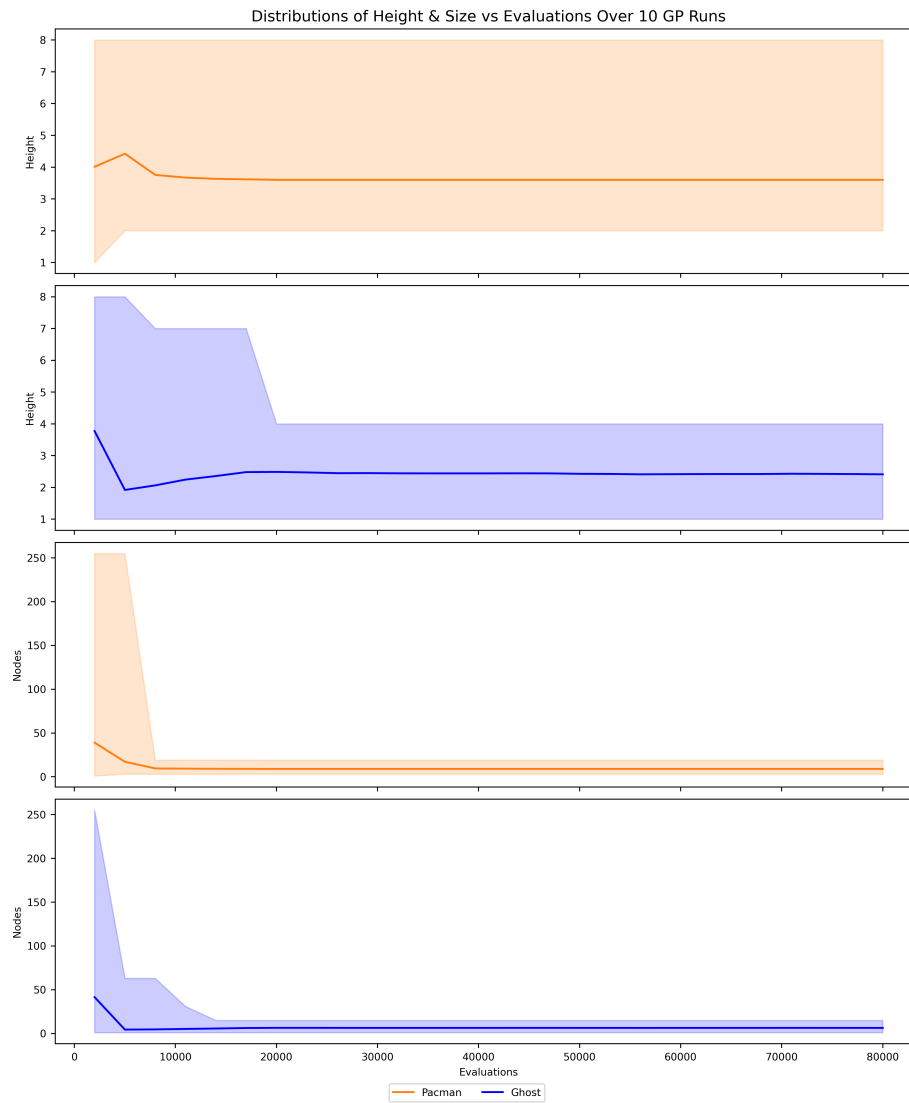Table 2: Ghost Parameters

1.2 Graphs

Figure 1: Distribution of tree size and height across Pac-man and the ghosts
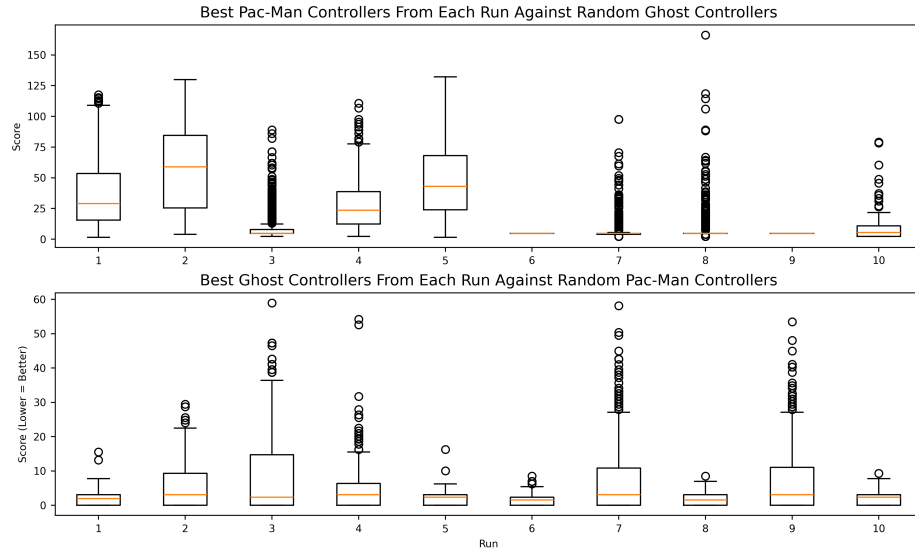
Figure 2: Performance of the five best-base-fitness Pac-Man and ghost controllers from the randomly generated opponents
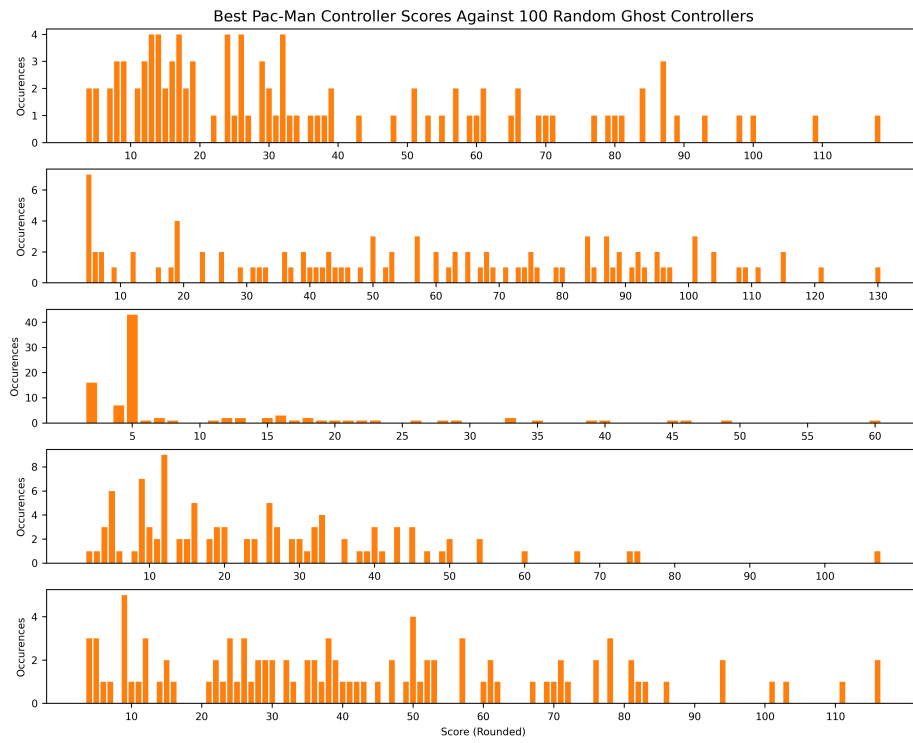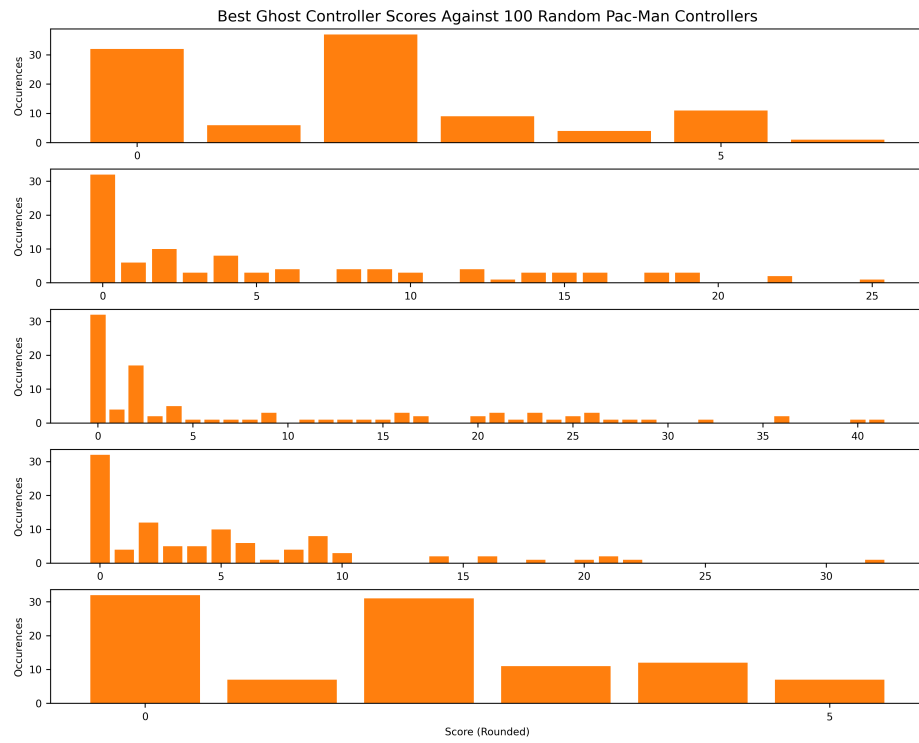
Figure 3: Histogram of Pac-man evaluations

Figure 4: Histogram of ghost evaluations

1.3 Qualitative Analysis

While Pac-man was able to avoid some of the ghosts, he was overall not very effective against three different ghosts at once. Its startegy seemed to main just to collect as many pills as possible and to move in the general opposite direction of the other ghosts. While this strategy may work with one ghost, it is not very effective at avoiding three ghosts at once. The ghosts on the other hand, tended to move straight towards Pac-man. This is a very effective strategy as Pac-man is not good at avoiding the ghosts and he does not move very strategically.
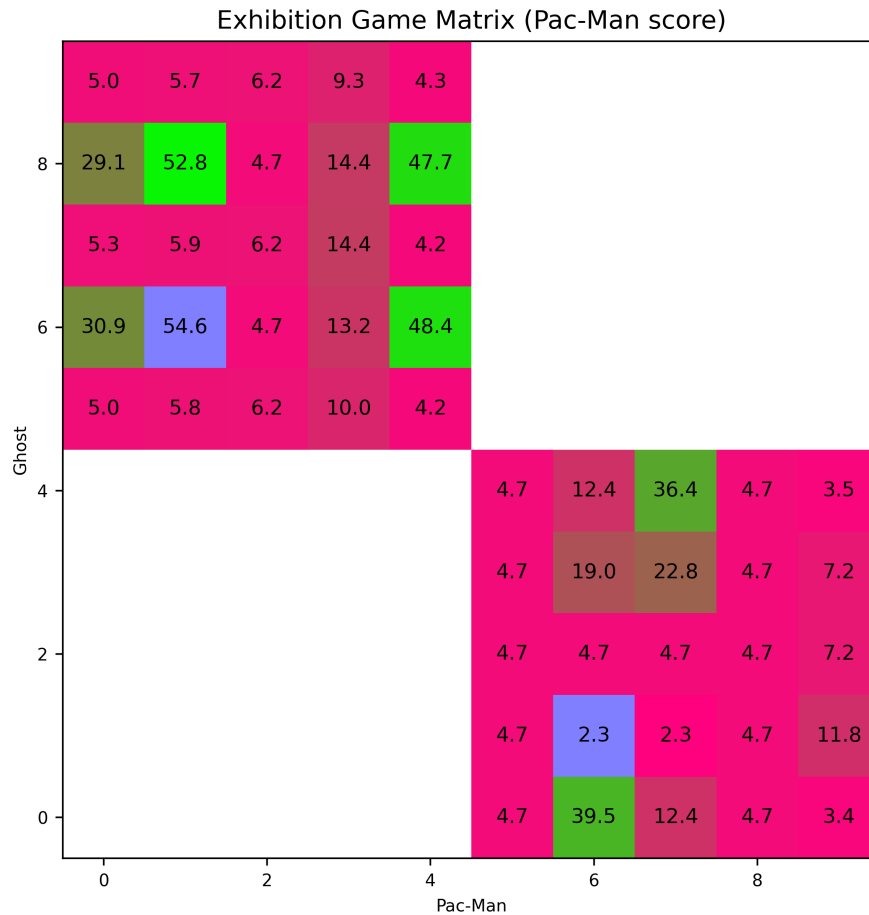
2 Yellow Problem 2c

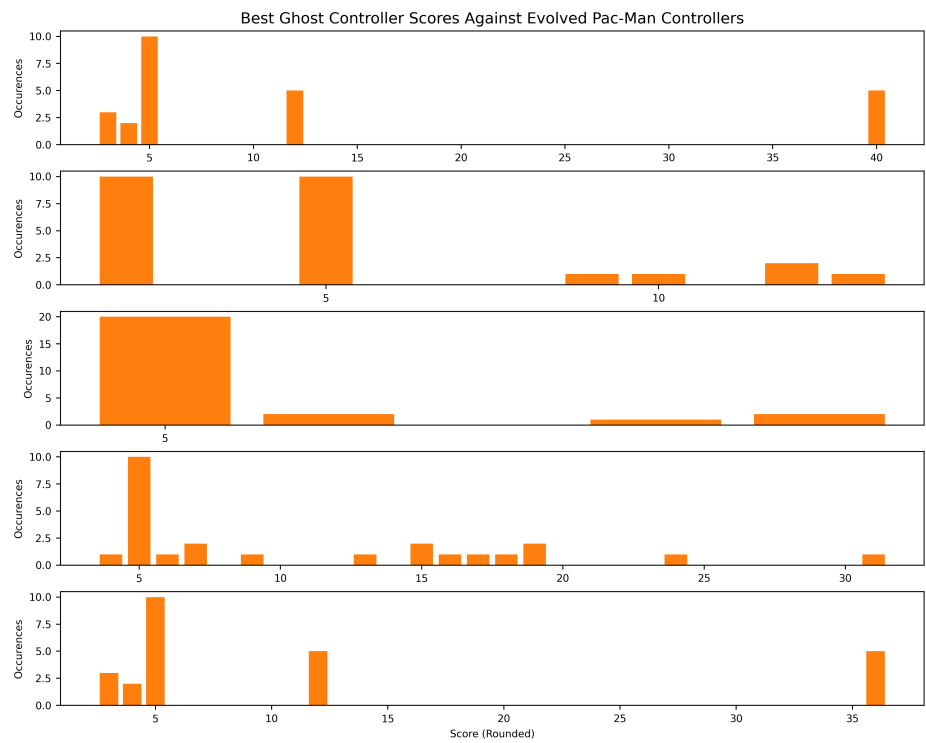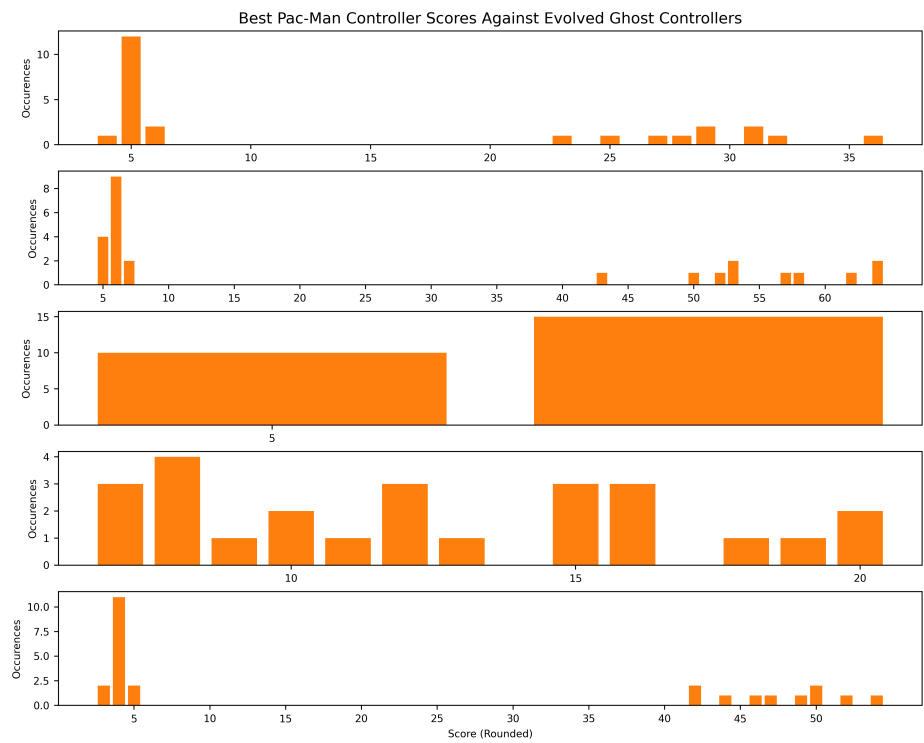Figure 5: Matrix analysis of best controllers

Figure 6: Analysis of ghost controllers

Figure 7: Analysis of Pac-man controllers