COMP 5660 Fall 2024 Assignment 2a

Logan Bolton

ldb0046@auburn.edu

1 Green Problem 2a - Random Search
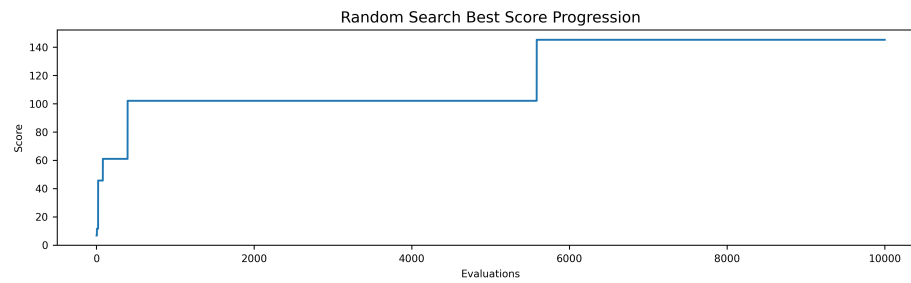
1.1 Graphs

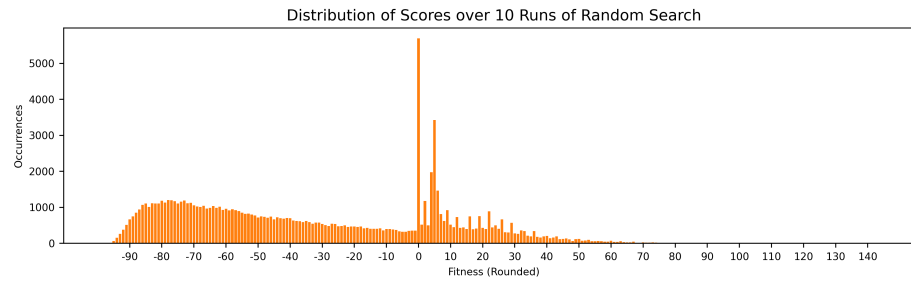Figure 1: Stair-step plot of the highest score seen over all evaluations.

Figure 2: Histogram with the distribution of random scores

1.2 Statistical Analysis

Parameter	Value
Mean	116.10706533776302
Standard Deviation	11.701890058712216

Table 1: Statistical results over 10 runs of 10,000 evaluations each.

1.3 Informal Analysis

I observed that while the best solution did have a high score, it did not seem
to act very intelligently. It frequently chose very inefficient, windy paths to eat
all the pills in a nearby section. A human player is much more likely to go in a
straight line to pick up all the pills in an organized manner.

However, I was happy with how it was choosing to prioritize eating pills versus eating fruit. I noticed that Pacman tended to move in the general direction
of the fruit, but it did not over commit by going directly to the fruit. This is
the type of behavior that a good Pacman player would do.

Given that this was just a randomly generated solution, I was pleased with
the results. However, there is clearly a large amount of improvement that can
be obtained.

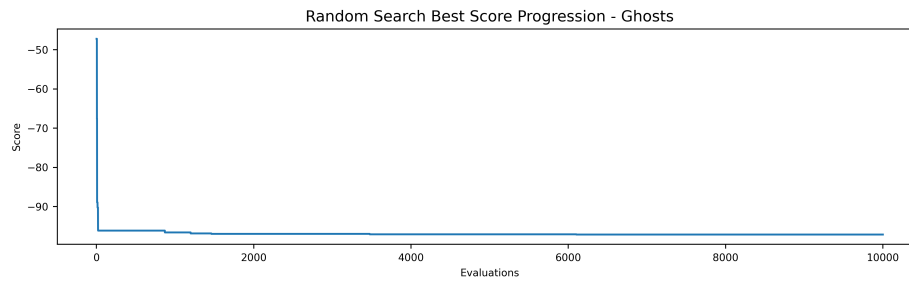# 2   Red 1 Problem 2a - Random Search (Ghosts)

2.1   Graphs

Figure 3: Stair-step plot of the lowest score seen over all ghost evaluations.
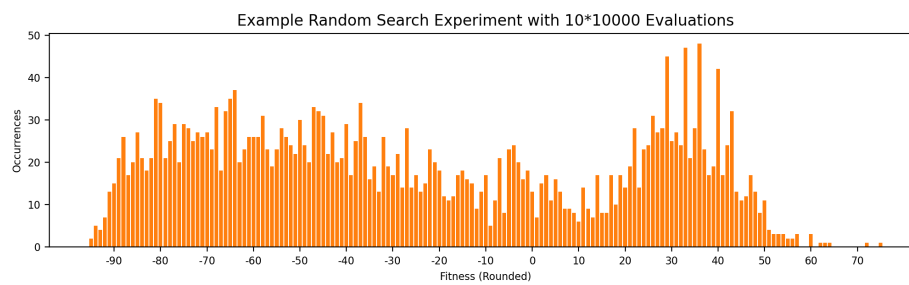

Figure 4: Histogram with the distribution of random ghost scores.

2.2 Statistical Analysis

Parameter	Value
Mean	-97.53262458471761
Standard Deviation	0.22880716594449052

Table 2: Statistical results over 10 runs of 10,000 evaluations each.

2.3 Informal Analysis

I observed that the best solution of the ghosts resulted in a very quick game. I gave a very high score to behavior that made ghosts to move straight to Pacman, so they basically ignored all the other objectives and went directly to him. While this is not a very intelligent solution, it is the best solution when Pacman is only moving randomly. If Pacman acted more intelligently, then it would be better for the ghosts to take other factors like pill location into account.