Jarrett Hill

Jwh0100@auburn.edu

COMP 5660 Fall 2023 Assignment 2b

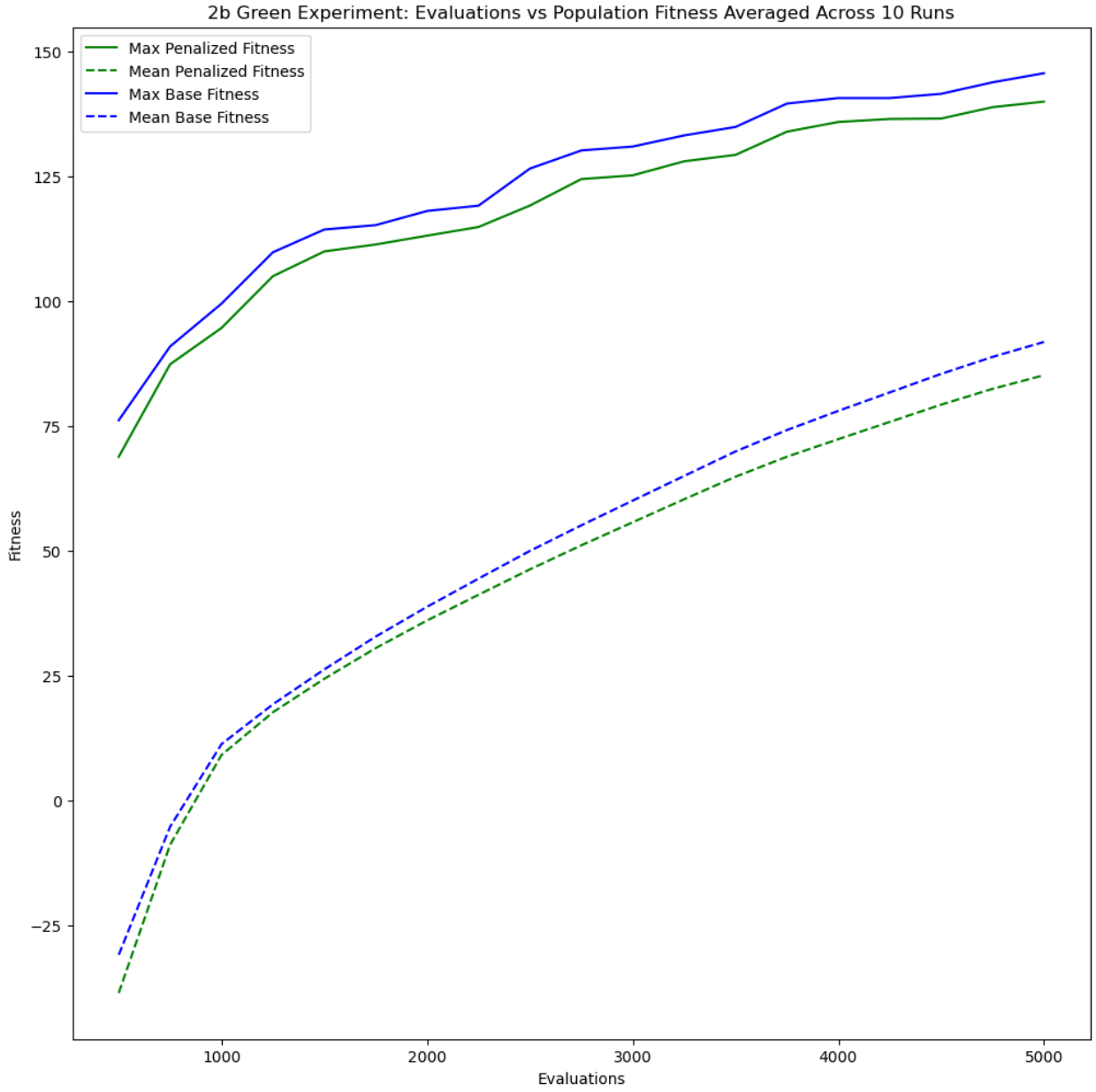
Statistical Analysis:
$\alpha = 0.05$

2b data mean: 145.5968992248062
2b data stdv: 13.759868252292733
2a data mean: 99.96899224806202
2a data stdv: 10.630944430375656
p-value: 2.286320279363648e-07

Since the p-value is much lower than alpha we reject the null hypothesis indicating that there is a statistically significant difference between the values collected from experiments 2a & 2b. The standard deviation tells us that the values collected from 2b are more spread out from the mean compared to the 2a data. The mean data suggests that the base fitnesses from 2b were significantly higher compared to 2a.

The fittest agent of 2b came from run 6. In the statistics.txt file I recorded the data for each generation as
(highest_penalized_fitness, average_penalized_fitness, highest_base_fitness, average_base_fitness, number_of_evaluations)
and each line in the file is 1 run.

Evals-vs-fitness Plot:



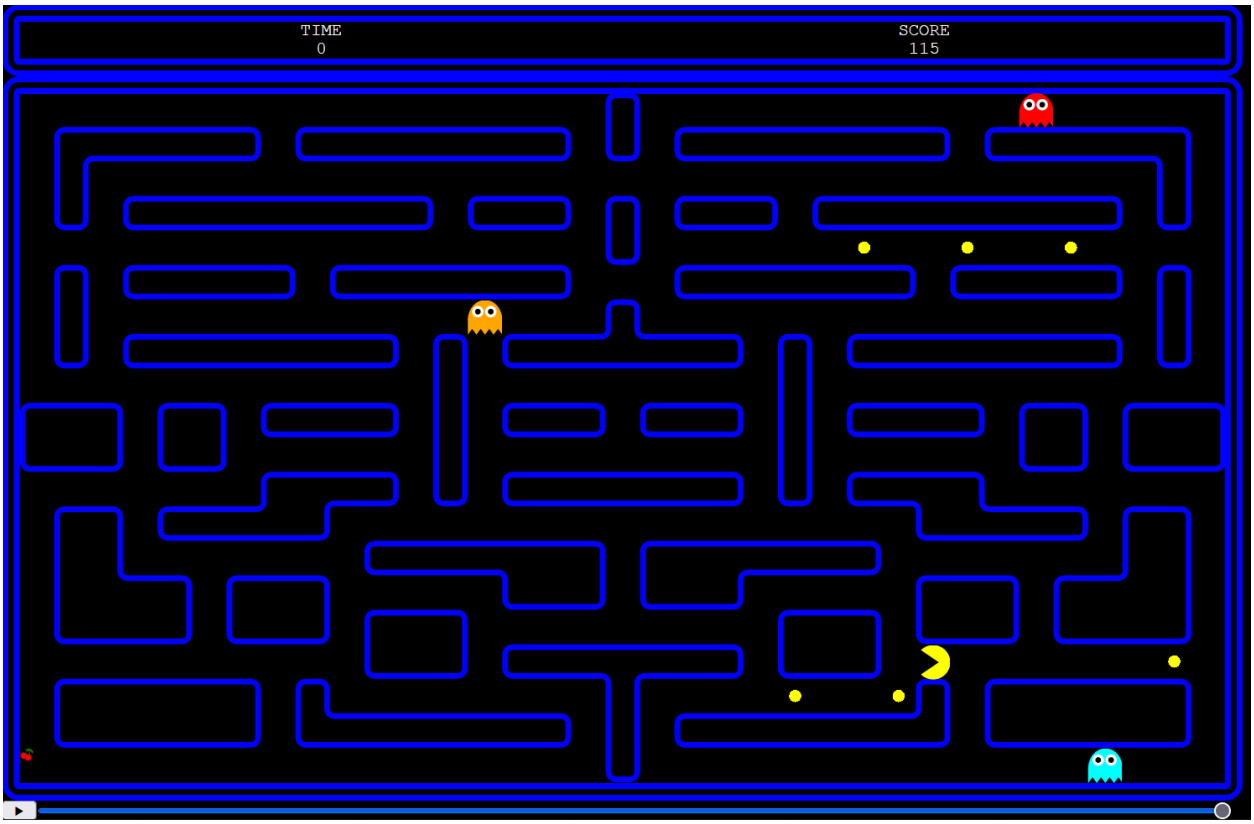
2a-vs-2b Agent Comparison:
2a mostly wandered from quadrant to quadrant while collecting *mo st* of the pills while wasting a lot of time "pacing" in empty ar eas and avoiding ghosts.

2b spent most of its time pathing towards fruit, instead of wast ing time by pacing like the 2a agent 2b instead wasted most of i ts time by chasing fruit through a path that had no more pills. I think this indicates that I have weighed the value of fruit to o high.

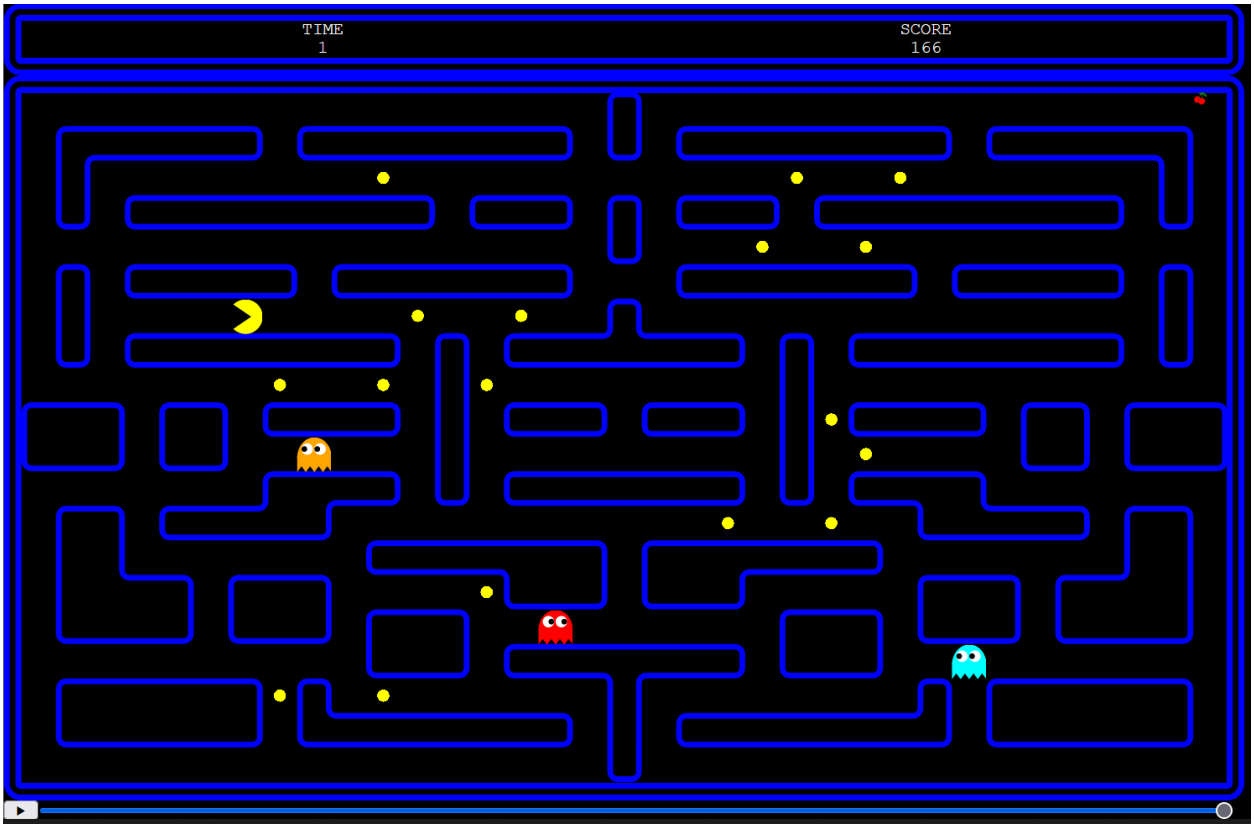
2a's parse tree is almost 3x as many lines as 2b's parse tree, so I think Parsimony Pressure was enforced. 2a has many more branches and is way more complex than 2b.

Ironically even though 2b has a much higher fitness than 2a, 2a actually collected more pills than 2b.

2a:



2b:


TIME
1
SCORE
166