COMP 5660 Fall 2024 Assignment 2b

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1 Green Problem 2b

1.1 Parameters

Parameter	**Value**
μ	2,000
Number of Children	250
Mutation Rate	0.10
Parent Selection	k_tournament_without_replacement
Parent Selection k_kwargs	{'k': 28}
Survival Selection	k_tournament_without_replacement
Survival Selection k_kwargs	{'k': 28}
Parsimony Coefficient	1/30

Table 1: Run Parameters

1.2 Graphs

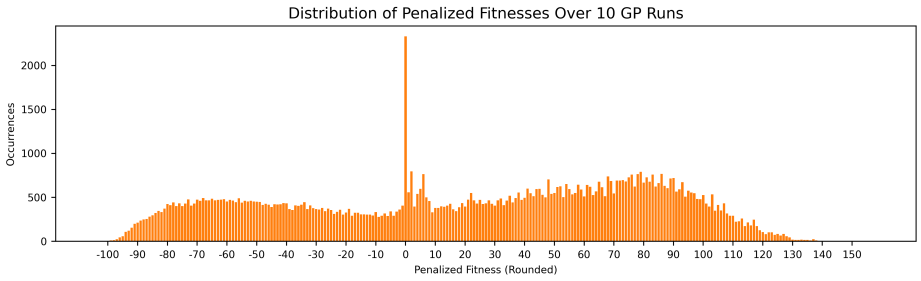

Figure 1: Histogram with the distribution of fitnesses

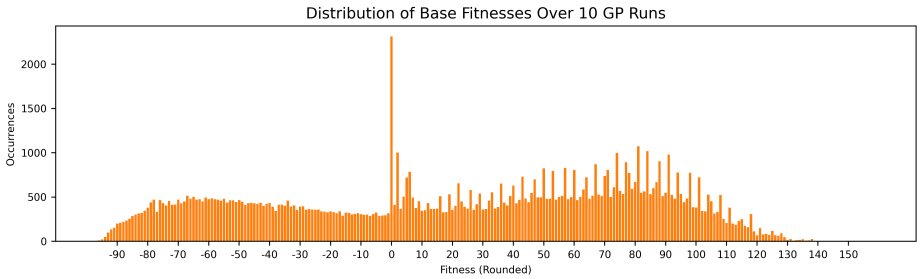

Figure 2: Histogram with the distribution of base fitnesses

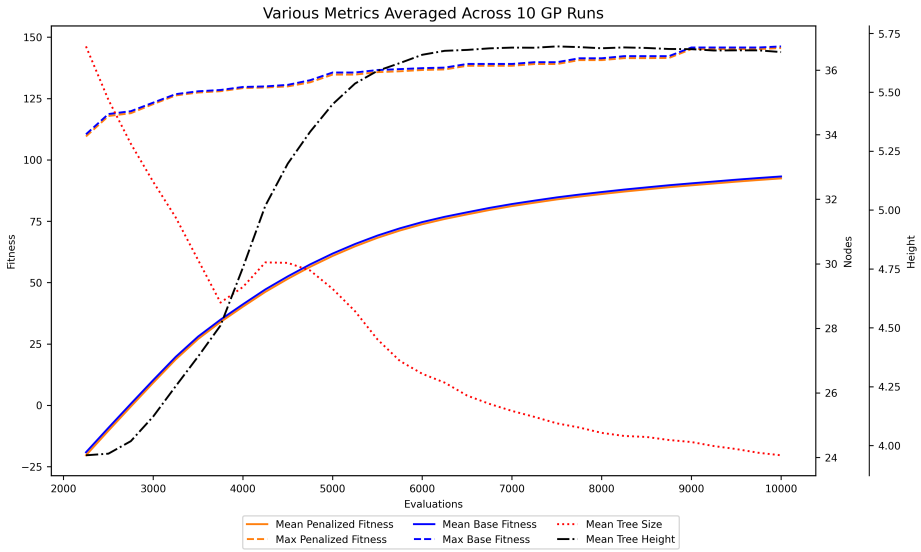

Figure 3: Evals-vs-metrics plot

1.3 Statistical Analysis

Parameter	**2a**	**2b**
Mean	116.11	146.29
Stdv	11.70	8.33
Number of Samples	10	
p-value	9.1407391762021e-06	
α-value	0.05	

Table 2: Comparison of results for data in 2a and 2b

The statistical analysis strongly supports rejecting the null hypothesis, with the p-value (9.1407391762021e-06) being much smaller than the α-value (0.05), indicating a significant difference between the two data sets. Based off this, we can confidently conclude that 2b had much better performance.

1.4 Informal Analysis

The solution I obtained this time was definitely better than random search. Pacman was able to skillfully avoid the ghosts as they approached him. However, I still felt like there was room for improvement. Pacman did not collect pellets in a very efficient manner in the same way that a human player would. Overall, the Pacman was still able to collect almost all the pellets without dying and so in that respect, it did a good job.