

Name: _____

Week 5 Assignment Addendum

New Version of Assignment 6: Do this instead of the original #6

Turn in this completed packet to mm@cs.pdx.edu

6. (a) Experiment with Different Mutation Rates: Download RobbyGA.nlogo from the Course Materials page.

Which mutation rate will result in a higher final fitness on average, 0.01, 0.05, or 0.1? Make a hypothesis, briefly explain your reasoning for it, then test it.

Hypothesis: _____

Reasoning: _____

For each parameter setting below, use the Behavior Space tool to run the GA five times, and record the average of the final best fitness in the population in the table below.

Then fill in the averages in the table below.

Number of Generations	Population Size	Mutation Rate	Average Best Fitness in Final Population (over 5 runs)
50	80	0.01	
50	80	0.05	
50	80	0.1	

Was your hypothesis confirmed? If not, any ideas why not?

(b) Experiment with Different Population Sizes

Which population size will result in a higher final fitness on average, 25, 50, or 100? Make a hypothesis, then test it.

Hypothesis: _____

Reasoning: _____

For each parameter setting below, use the Behavior Space tool to run the GA five times, and record the average of the final best fitness in the population in the table below.

Number of Generations	Population Size	Mutation Rate	Average Best Fitness in Final Population (over 5 runs)
50	25	0.05	
50	50	0.05	
50	100	0.05	

Was your hypothesis confirmed? If not, any ideas why not?

c) Allowing user to set crossover probability. In the current version of RobbyGA.nlogo, each child is created via a crossover between the parents. However, in many GAs, the user can set a “crossover probability”, which gives the probability that two parents will create a child via crossover, or via cloning of one of the parents. Modify RobbyGA.nlogo to include a user-settable crossover probability.

Which crossover probability will result in a higher final fitness on average, zero, 0.5, or 1.0? Make a hypothesis, then test it.

Hypothesis: _____

Reasoning: _____

For each parameter setting below, use the Behavior Space tool to run the GA five times, and record the average of the final best fitness in the population in the table below.

Number of Generations	Population Size	Mutation Rate	Crossover Probability	Average Best Fitness in Final Population (over 5 runs)
50	80	0.05	0	
50	80	0.05	.5	
50	80	0.05	1	

Was your hypothesis confirmed? If not, any ideas why not?