Laboratory Experiment 3a:

Genetic Algorithm-Based

Word Guessing Game

v01.00

I.   Objective:

    a. This experiment named Word Guessing Game is a program that will try to do as the traditional Pinoy Henyo – to guess a given word. The program will generate combination of letters in order to make up a word.

    b. The designed GA program must be implemented with Genetic Operators like recombination and mutation.

    c. The program will then try to guess the given word after 100 generations.

    d. The program will also display the cost function graph to show that for every generation, the target cost is minimized.

II.   Materials
    a. MATLAB
    b. SRS
    c. PC

III.   Cost Function

$$cost = \sum_{n=1}^{\# \ letters} (guess[n] - answer[n])^2$$

where:

    # of letters = number of letters in the word

    guess[n] = letters n in the guess chromosome

    answer[n] = letter n in the answer.

IV.   Program Flow
    a. There will be two agents in the code. The Guesser, and the Game master. These will be represented by two functions in the code. The Game Master will keep the word and compute the cost value and return it to the Guesser. The Guesser will be the one that performs the GA. Randomizing the word, running the Genetic Operators, and create an offspring (Best Guess word) and return it to the Game Master. The fetching and execution will be performed until the generations have reached 100.
    b. Enter any word in your mind, and will be stored by the Game Master.
    c. The program must display a table of Generation, Best Guess, and Cost Value.
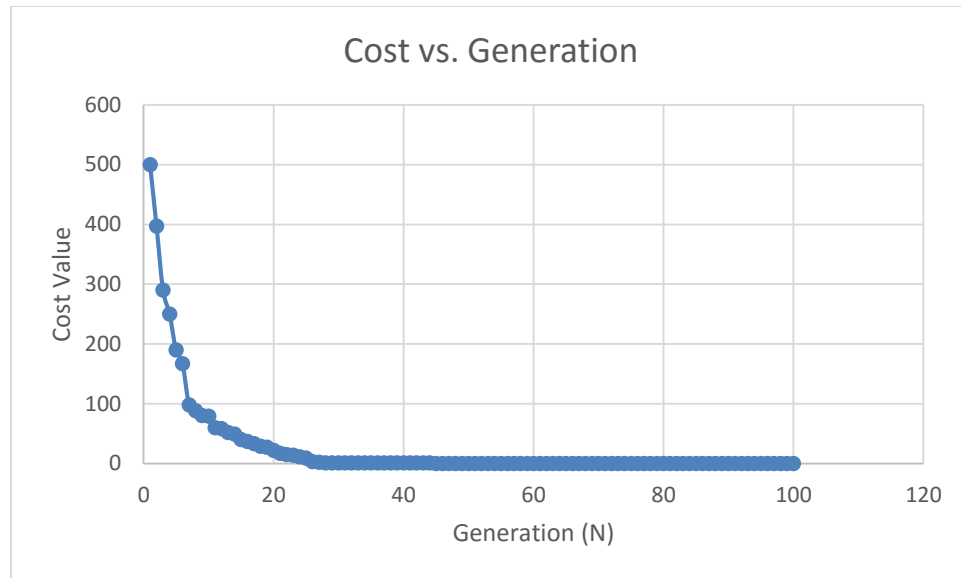   Example: Word to be Guess: colorado.

Generation	Best Guess	Cost Value
1	dhgmtfbn	XXXXXX
2	bmloshjm	XXXXXX
3	bmlorfds	XXXXXX
…		
100	colorado	0

d.   The Program will display a graph that will show the relationship of the cost value versus the generation.

Cost vs. Generation

e.   The program will display the best Guess Word.