

This is a programming assignment. You can use any programming language. Program a Genetic Algorithm to find an integer number between 0 and 31 that maximizes the function $f(x) = x^2$.

The initial procedure is given as below.

- Population size: 8
- Crossover probability: 100%
- Mutation probability: 5%
- Terminating criteria:
 - When your program produces an average of candidates is equal to or greater than 29, then you can accept it as a terminating condition.
- Fitness function:
 - You can use the function itself ($f(x) = x^2$) as your fitness function.

1. For the 1st generation, you need to print the process and result of selection, crossover, and mutation operation.

you need to print the corresponding integer values and bits (binary values) of selection, crossover, and mutation operation. You also need to decide and print the crossover point and the mutation point.

2. From the 2nd generation, you do not have to print all results of selection, crossover, mutation operations. You can just print the result of each generation.

You should submit the followings to have full score:

- (1) your program source file
- (2) your pdf list of the program
- (3) the output printed by running your program.