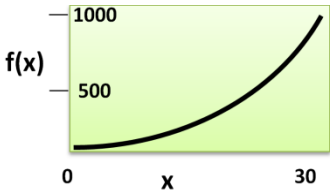
Tutorial 2: Genetic Algorithms

1 **Consider a simple function f(x)=x*x on the integer interval [0,30].**



Consider the following four strings in initial population: (01101), (11000), (01000), and (10011). Use a simple genetic algorithm composed of three operators(Reproduction, Crossover and Mutation) to maximize the aforementioned function in given interval.

Calculate initial fitness and make roulette wheel selection.

Sr. No. of individual	Value of x	Decimal value of x	Fitness f(x) = x*x (Value in decimal)	Roulette wheel selection count
1	01101			
2	11000			
3	01000			
4	10011			

Modify the population and recalculate fitness of the modified individuals.

Sr. No. of selected individual	Value of x	New individual after mutation and cross-over	Operation site	Fitness f(x) = x*x (Value in decimal)
1				
2				
3				
4				

Value of X that maximizes the function f(x) is : _____.

2 **Given initial population of two valid routes as** I= { (3 6 2 1 4 5) and (5 2 1 3 6 4)}**; prepare adjacency table and create new route for traveling sales person problem using Genetic Algorithm(GA).**

Key	Adjacent Keys
1	
2	
3	
4	
5	
6	

New Route:

_____

3. Maximize f(x,y) = x +2y; where x and y belong to [0, 7] with help of genetic algorithms. Also state the maximized value for function.

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