

Q. * $f(x) = x^2$ main function

Population size : 4

1 point crossover

Selection:

String no.	Initial population	Value x	fitness $f(x) = x^2$	Probability (P)	Expected count (N * P)
1	0 1 1 0 1	13	169	0.14	0.56
2	1 1 0 0 0	24	576	0.49	1.96
3	0 1 0 0 0	8	64	0.06	0.24
4	1 0 0 1 1	19	361	0.31	1.24
Sum			1170	1	4
Average			292.5	0.25	1
Max			576	0.49	1.96

→ highest value

→ lowest value

[∵ binary → decimal

= 01101
= x's value

13

$f(x) = x^2$ → fitness value

= Probability $P_i = \frac{f_i}{f_1 + f_2 + f_3 + f_4}$

$$f_2 = \frac{f_2}{f_1 + f_2 + f_3 + f_4}$$

Expected count $\frac{N \times P}{2}$

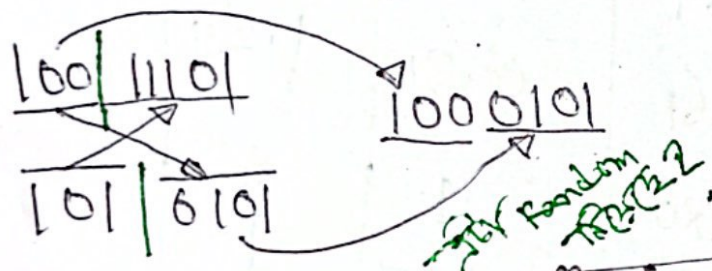
N = How many observation you took
Here $N = 4$

P = Probability

Crossover:

Can be either one point / 2 point / n point

Question \rightarrow 1 point crossover



String no.	Mating pool	Crossover point	offspring after crossover	offspring after crossover	Fitness $f(x) = x^2$
1	01101	4	01100	12	144
2	11000	4	11001	25	625
2	11000	2	11011	27	729
4	101011	2	10000	16	256
Sum					1754
Average					438.5
Max					729

Sum 3 to 4 value is same, then expected count lowest then 2 highest to replace 2.

Mutation :

String no.	Offspring after crossover	Offspring after mutation	Value x	Fitness $f(x) = x^2$
1	01100	11100	2	625
2	11001	11001	25	729
3	11011	11011	27	
4	10000	10100	2	

Crossover & Fitness 144, 256 lowest
 ଓଡ଼ି ଭାଷା, mating pool randomly change
 କରା, ନିଜ ଅଟ।