Genetic Algorithm

컴퓨터공학부 201814121 이연희

· Evolving process

- 1st generation

No.	string	fitness	% of total
1	01101	169	14.4
2	11000	576	49.2
3	01000	64	5.5
4	10011	361	30.9
Total		1170	100

- 2nd generation

No.	initial Population	x value	x^2	Pselect	expected Count	Actual Count
1	01101	13	169	0.14	0.58	1
2	11000	24	576	0.49	1.97	2
3	01000	8	64	0.06	0.22	0
4	10011	19	361	0.31	1.23	1
Sum			1170	1.00	4.00	4.0
Average			293	0.25	1.00	1.0
Max			576	0.49	1.97	2.0

reproduction	mate	Cross Site	new Population	x value	x^2
0110|1	2	4	01100	12	144
1100|0	1	4	11001	25	625
11|000	4	2	11011	27	729
10|011	3	2	10000	16	256
					1754
					439
					729

- 3rd generation

No.	initial Population	x value	x^2	Pselect	expected Count	Actual Count
1	01100	12	144	0.08	0.33	1
2	11001	25	625	0.36	1.42	1
3	11011	27	729	0.42	1.66	2
4	10000	16	256	0.14	0.59	0
Sum			1754	1.00	4.00	4.0
Average			439	0.25	1.00	1.0
Max			729	0.42	1.66	2.0

reproduction	mate	Cross Site	new Population	x value	x^2
011|00	2	3	01101	13	169
110|01	1	3	11000	24	576
1|1011	4	1	11011	27	729
1|1011	3	1	11011	27	729
					2203
					551
					729

- 4th generation

No.	initial Population	x value	x^2	Pselect	expected Count	Actual Count
1	01101	13	169	0.08	0.31	1
2	11000	24	576	0.26	1.05	1
3	11011	27	729	0.33	1.32	1
4	11011	27	729	0.33	1.32	1
Sum			2203	1.00	4.00	
Average			551	0.25	1.00	
Max			729	0.33	1.32	

reproduction	mate	Cross Site	new Population	x value	x^2
1101|1	2	4	11010	26	676
1100|0	1	4	11001	25	625
01|101	4	2	01011	11	121
11|011	3	2	11101	29	841
					2263
					566
					841

- 5th generation

No.	initial Population	x value	x^2	Pselect	expected Count	Actual Count
1	11010	26	676	0.30	1.19	1
2	11001	25	625	0.28	1.10	1
3	01011	11	121	0.05	0.22	0
4	11101	29	841	0.37	1.49	2
Sum			2263	1.00	4.00	
Average			566	0.25	1.00	
Max			841	0.37	1.49	

reproduction	mate	Cross Site	new Population	x value	x^2
11|101	2	2	11010	26	676
11|010	1	2	11101	29	841
1|1101	4	1	11001	25	625
1|1001	3	1	11101	29	841
					2983
					746
					841

>> 첫번째 세대에서 다섯번째 세대에 이르기까지 total fitness는 1170 → 1754 → 2203 → 2263 → 2983 으로 증가하는 형세를 보였다.

Roulette Wheel Selection을 사용하여 다음 세대를 거듭할수록 더 나은 Chromosome을 재생산 할 수 있었다.