1.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

| 1 | 3 | 1 | 8 | 2 | 6 | 4 | 7 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 4, 7, 8

| 5 | 3 | 1 | 8 | 2 | 6 | 4 | 3 | 8, 4, 7

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

| 5 | 3 | 1 | 8 | 2 | 6 | 9 | 7 |

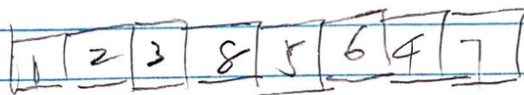| 1 | 2 | 3 | 8 | 5 | 6 | 4 | 7 |

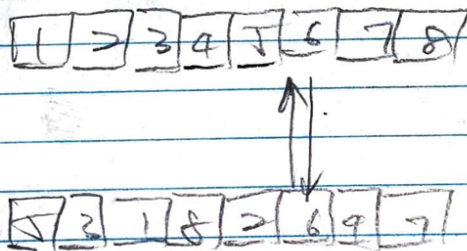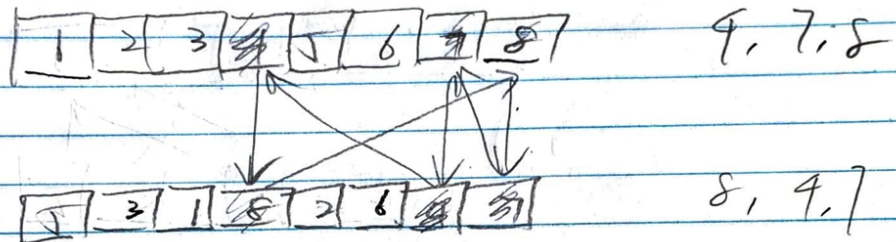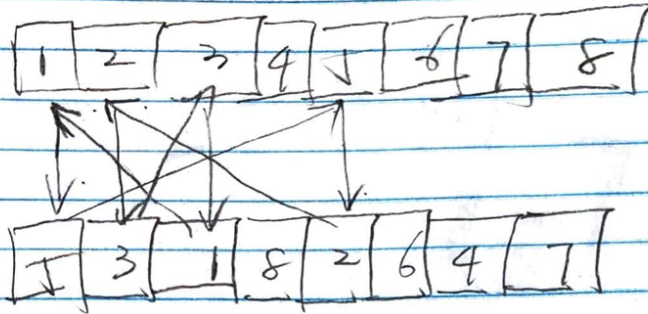| 5 | 3 | 1 | 4 | 2 | 6 | 7 | 8 |

Selection: Calculation [15 marks]

Fitness function f(x) = x(x-1)/2

Individual	Fitness	Linear Rank, s= 1.2	Linear Rank, s =1.8	Windowing
3	0.065	0.180	0.120	0.049
7	0.457	0.240	0.360	0.488
2	0.022	0.160	0.040	0.000
6	0.326	0.220	0.280	0.341
4	0.130	0.200	0.200	0.122

Selection: Reflection [5 marks]

a) Linear ranking:Why must s be strictly greater than 1? [1 mark]

Because if s is equal to 1, the every individual will be chose equally.

b) What are the implications for the least fit member (or equally least fit members) of the population when s=2? [1 mark]

The fitness formula would be 0 + 2i/(u(u+1)), since the least fit rank is 0. The result is 0. So there is no possibility to choose the least fit member.

c) A Deterministic Approach?

If we only choose the top 20%, there are no chance to choose the rest 80%.

It loss the exploration opportunity and loss the most of genes that may have a better solution. so it can also cause premature convergence.