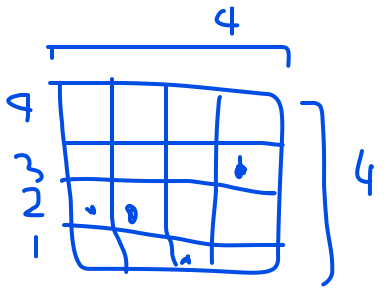
N-Queen Problem [Genetic Algorithm]

total graph 4^4

N Queen



→ Gene Encoding

Cond:

Non clashing Queens

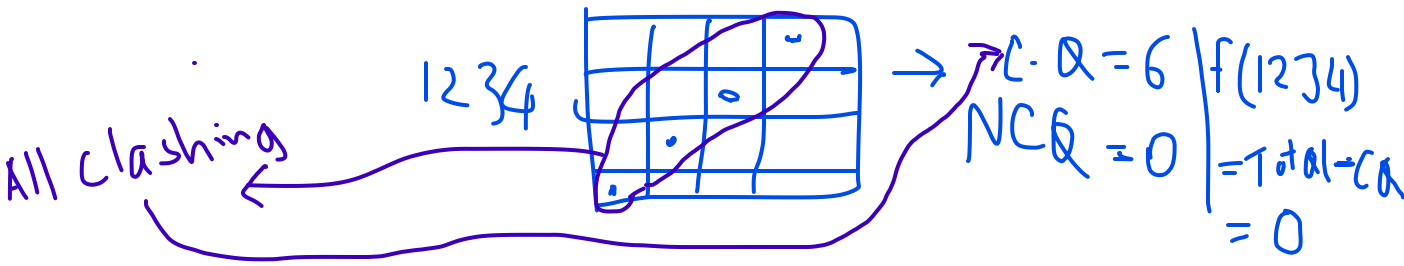
↓

NCQ

P [1234, 3131, 2134, 2332]

Total #Clash = $4C_2 = 6$

clashing Queen, C.Q

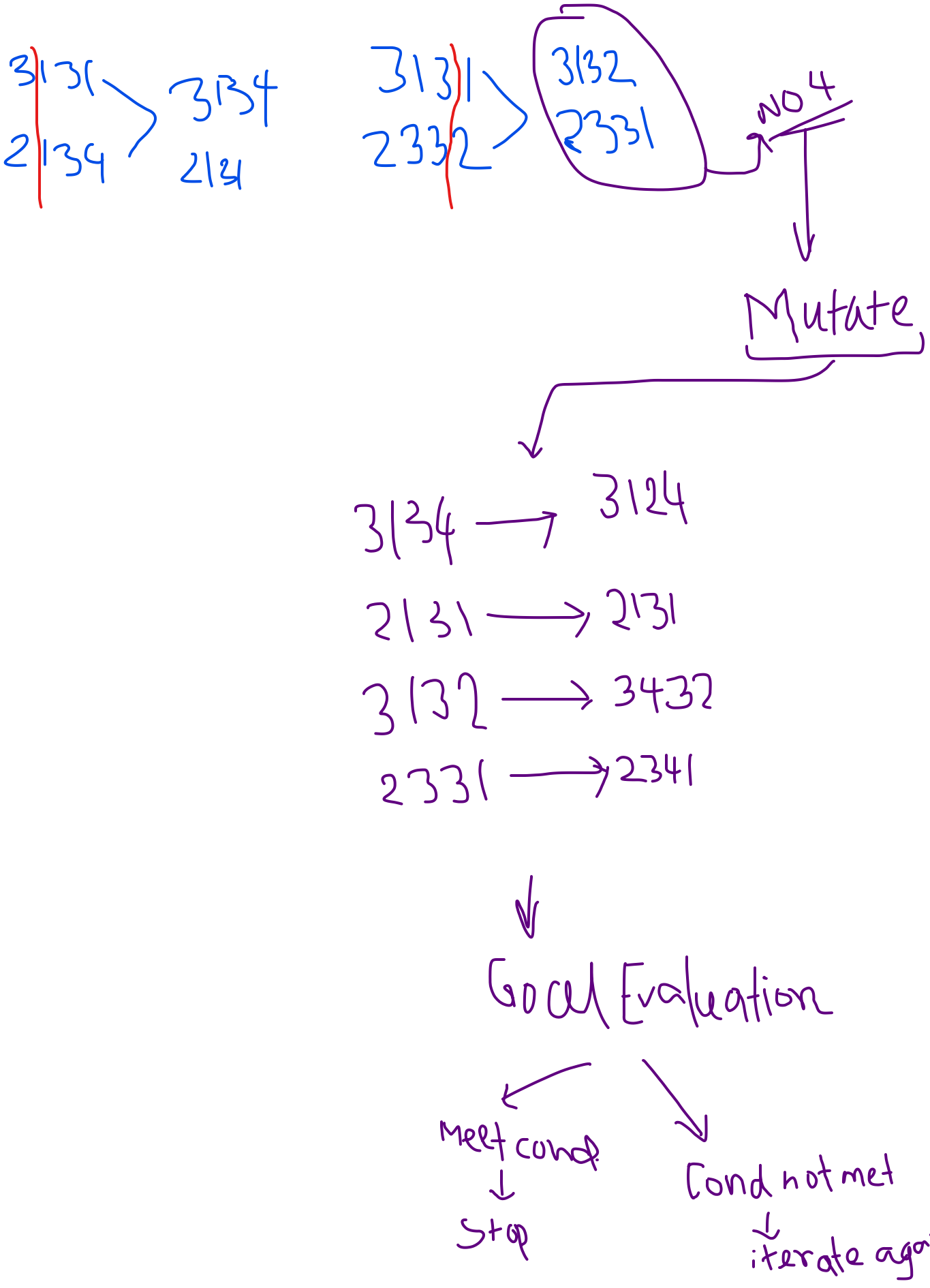


3131 = 2

f(3131) = 6 - 2 = 4

f(2134) = 4

f(2332) = 2

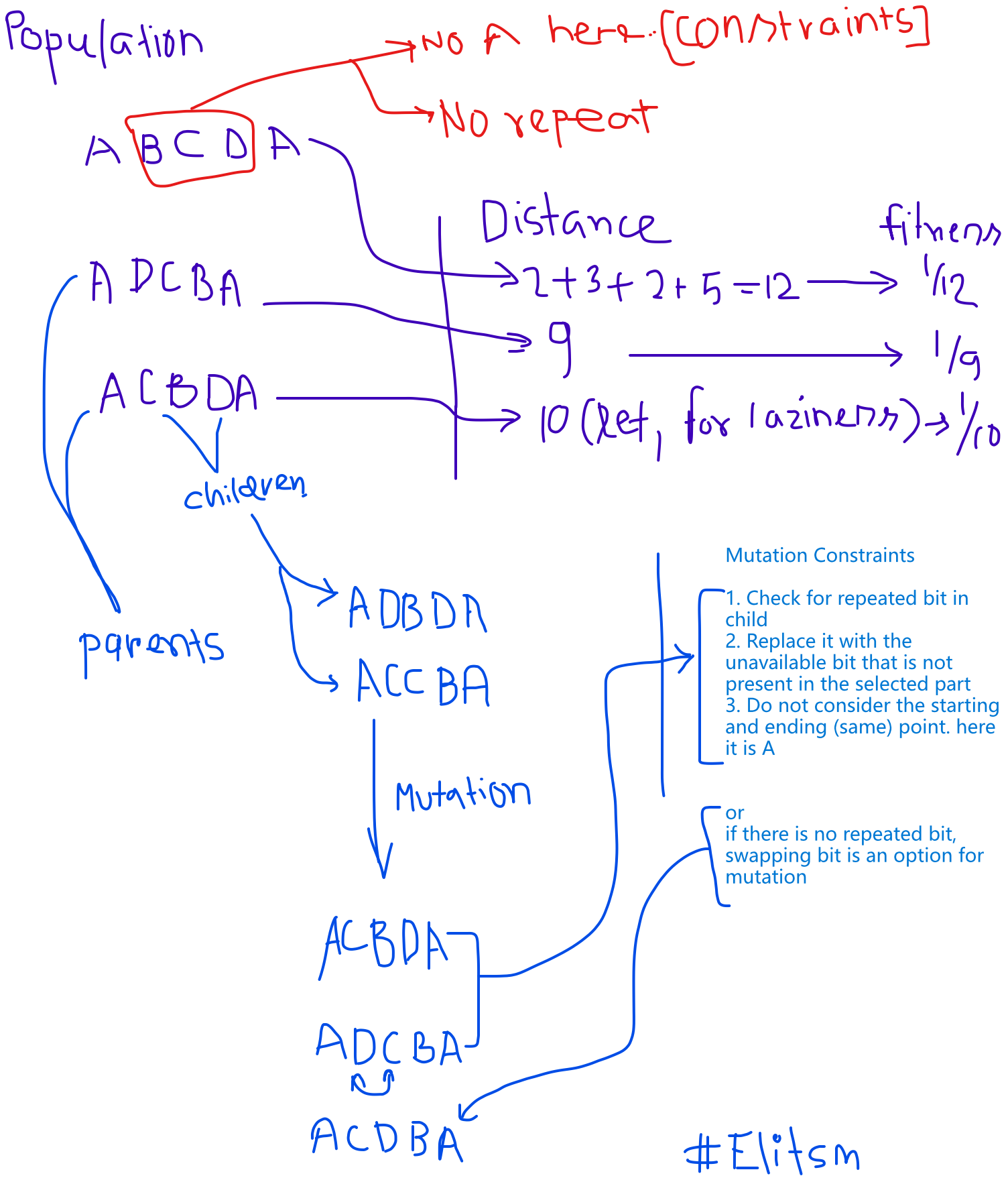

3131
2134
3134
2134
3131
2332
3132
2331
NO 4
Mutate
3134 → 3124
2131 → 2131
3132 → 3432
2331 → 2341
Goal Evaluation
Meet cond
Stop
Cond not met
iterate again

Travelling Salesman Problem [TSP]

A → B → C → D → E → A

	A	B	C	D
A	0	2	3	4
B	1	0	3	4
C	1	1	0	2
D	5	4	3	0

Distance from D to C


Population
No A here [Constraints]
No repeat
A B C D A
Distance
fitness
A D C B A
2+3+2+5=12
1/12
9
1/9
A C B D A
10 (let, for laziness)
1/10
children
parents
A D B D A
A C C B A
Mutation
A C B D A
A D C B A
A C D B A
Mutation Constraints
1. Check for repeated bit in child
2. Replace it with the unavailable bit that is not present in the selected part
3. Do not consider the starting and ending (same) point. here it is A
or
if there is no repeated bit, swapping bit is an option for mutation
#Elitsm
Preserve the best population from parents to crossover the best population from children.

0/1 knapsack

Capacity --> 40

Item	weight	price
1	10	1000
2	5	500
3	20	600
4	30	200