Cycle Crossover (CX) Example

Step 1: Parents

Parent 1:

1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8

Parent 2:

5	4	6	9	2	3	7	1	8
0	1	2	3	4	5	6	7	8

Step 2: Find Cycle 1 (start from position 0)

Parent 1:

1	2	3	4	5	6	7	8	9

Parent 2:

5	4	6	9	2	3	7	1	8

Cycle 1:
Position 0: 1 → 5 (pos 0)
Position 0: 5 → 1 (pos 0)
Find 5 in P1: pos 4
At pos 4 in P2: 2
Find 2 in P1: pos 1
At pos 1 in P2: 4
Find 4 in P1: pos 3
At pos 3 in P2: 9
Find 9 in P1: pos 8
At pos 8 in P2: 8
Find 8 in P1: pos 7
At pos 7 in P2: 1 (back to start)

Step 3: Find Cycle 2 (start from position 2)
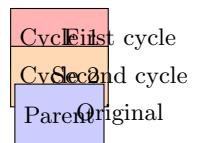
Parent 1:

1	2	3	4	5	6	7	8	9

Parent 2:

5	4	6	9	2	3	7	1	8

Step 4: Child 1 (Cycle 1 from P1, Cycle 2 from P2)

Child 1:

1	2	6	4	5	3	7	8	9

Cycle 1 First cycle
Cycle 2 Second cycle
Parent Original

Step 5: Child 2 (Cycle 1 from P2, Cycle 2 from P1)

Child 2:

5	4	3	9	2	6	7	1	8