

Step 1: Original Parents with Position Indices

Parent 1:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%;">1</td><td style="width: 10%;">2</td><td style="width: 10%;">3</td><td style="width: 10%;">4</td><td style="width: 10%;">5</td><td style="width: 10%;">6</td><td style="width: 10%;">7</td><td style="width: 10%;">8</td><td style="width: 10%;">9</td></tr> </table>	1	2	3	4	5	6	7	8	9											
1	2	3	4	5	6	7	8	9													
Positions: Parent 2:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%; background-color: green;">0</td><td style="width: 10%; background-color: green;">1</td><td style="width: 10%; background-color: green;">2</td><td style="width: 10%; background-color: green;">3</td><td style="width: 10%; background-color: green;">4</td><td style="width: 10%; background-color: green;">5</td><td style="width: 10%; background-color: green;">6</td><td style="width: 10%; background-color: green;">7</td><td style="width: 10%; background-color: green;">8</td><td style="width: 10%; background-color: green;">9</td></tr> <tr><td style="width: 10%;">5</td><td style="width: 10%;">4</td><td style="width: 10%;">6</td><td style="width: 10%;">9</td><td style="width: 10%;">2</td><td style="width: 10%;">3</td><td style="width: 10%;">7</td><td style="width: 10%;">1</td><td style="width: 10%;">8</td><td style="width: 10%;">8</td></tr> </table>	0	1	2	3	4	5	6	7	8	9	5	4	6	9	2	3	7	1	8	8
0	1	2	3	4	5	6	7	8	9												
5	4	6	9	2	3	7	1	8	8												
Positions:	<table border="0" style="width: 100%;"> <tr><td style="width: 10%;">0</td><td style="width: 10%;">1</td><td style="width: 10%;">2</td><td style="width: 10%;">3</td><td style="width: 10%;">4</td><td style="width: 10%;">5</td><td style="width: 10%;">6</td><td style="width: 10%;">7</td><td style="width: 10%;">8</td><td style="width: 10%;">9</td></tr> </table>	0	1	2	3	4	5	6	7	8	9										
0	1	2	3	4	5	6	7	8	9												

Step 2: Find Cycle 1 (Starting from Position 0)

Parent 1:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%;">1</td><td style="width: 10%;">2</td><td style="width: 10%; background-color: yellow;">3</td><td style="width: 10%;">4</td><td style="width: 10%;">5</td><td style="width: 10%; background-color: yellow;">6</td><td style="width: 10%;">7</td><td style="width: 10%;">8</td><td style="width: 10%;">9</td></tr> </table>	1	2	3	4	5	6	7	8	9	Cycle 1 positions: [0, 4, 1, 3, 8, 7] Start at pos 0: P1[0]=1, P2[0]=5 Find 5 in P1: position 4 At pos 4: P1[4]=5, P2[4]=2 Find 2 in P1: position 1 At pos 1: P1[1]=2, P2[1]=4 Find 4 in P1: position 3
1	2	3	4	5	6	7	8	9			
Parent 2:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%;">5</td><td style="width: 10%;">4</td><td style="width: 10%; background-color: yellow;">6</td><td style="width: 10%;">9</td><td style="width: 10%;">2</td><td style="width: 10%; background-color: yellow;">3</td><td style="width: 10%;">7</td><td style="width: 10%;">1</td><td style="width: 10%;">8</td></tr> </table>	5	4	6	9	2	3	7	1	8	
5	4	6	9	2	3	7	1	8			

Step 3: Identify All Cycles

Parent 1:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%;">1</td><td style="width: 10%;">2</td><td style="width: 10%; background-color: yellow;">3</td><td style="width: 10%;">4</td><td style="width: 10%;">5</td><td style="width: 10%; background-color: yellow;">6</td><td style="width: 10%;">7</td><td style="width: 10%;">8</td><td style="width: 10%;">9</td></tr> </table>	1	2	3	4	5	6	7	8	9	All Cycles: Cycle 1: [0, 4, 1, 3, 8, 7] Cycle 2: [2, 5] Cycle 3: [6]
1	2	3	4	5	6	7	8	9			
Parent 2:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%;">5</td><td style="width: 10%;">4</td><td style="width: 10%; background-color: yellow;">6</td><td style="width: 10%;">9</td><td style="width: 10%;">2</td><td style="width: 10%; background-color: yellow;">3</td><td style="width: 10%;">7</td><td style="width: 10%;">1</td><td style="width: 10%;">8</td></tr> </table>	5	4	6	9	2	3	7	1	8	
5	4	6	9	2	3	7	1	8			

Step 4: Create Child 1 (Alternate cycles: C1 from P1, C2 from P2, etc.)

Child 1:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%;">1</td><td style="width: 10%;">2</td><td style="width: 10%; background-color: yellow;">6</td><td style="width: 10%;">4</td><td style="width: 10%;">5</td><td style="width: 10%; background-color: yellow;">3</td><td style="width: 10%;">7</td><td style="width: 10%;">8</td><td style="width: 10%;">9</td></tr> </table>	1	2	6	4	5	3	7	8	9	Source for each cycle: Cycle 1: from Parent 1 Cycle 2: from Parent 2 Cycle 3: from Parent 1
1	2	6	4	5	3	7	8	9			

Step 5: Create Child 2 (Alternate cycles: C1 from P2, C2 from P1, etc.)

Child 2:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%;">5</td><td style="width: 10%;">4</td><td style="width: 10%; background-color: yellow;">3</td><td style="width: 10%;">9</td><td style="width: 10%;">2</td><td style="width: 10%; background-color: yellow;">6</td><td style="width: 10%;">7</td><td style="width: 10%;">1</td><td style="width: 10%;">8</td></tr> </table>	5	4	3	9	2	6	7	1	8	Source for each cycle: Cycle 1: from Parent 2 Cycle 2: from Parent 1 Cycle 3: from Parent 2
5	4	3	9	2	6	7	1	8			

Step 6: Final Result Comparison

Child 2:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%;">5</td><td style="width: 10%;">4</td><td style="width: 10%;">3</td><td style="width: 10%;">9</td><td style="width: 10%;">2</td><td style="width: 10%;">6</td><td style="width: 10%;">7</td><td style="width: 10%;">1</td><td style="width: 10%;">8</td></tr> </table>	5	4	3	9	2	6	7	1	8	Validation: Child 1: ✓ Valid Child 2: ✓ Valid
5	4	3	9	2	6	7	1	8			
Child 1:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%;">1</td><td style="width: 10%;">2</td><td style="width: 10%;">6</td><td style="width: 10%;">4</td><td style="width: 10%;">5</td><td style="width: 10%;">3</td><td style="width: 10%;">7</td><td style="width: 10%;">8</td><td style="width: 10%;">9</td></tr> </table>	1	2	6	4	5	3	7	8	9	
1	2	6	4	5	3	7	8	9			
Parent 2:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%;">5</td><td style="width: 10%;">4</td><td style="width: 10%; background-color: green;">6</td><td style="width: 10%;">9</td><td style="width: 10%;">2</td><td style="width: 10%; background-color: green;">3</td><td style="width: 10%;">7</td><td style="width: 10%;">1</td><td style="width: 10%;">8</td></tr> </table>	5	4	6	9	2	3	7	1	8	Key Property: Each element maintains its position from one parent
5	4	6	9	2	3	7	1	8			
Parent 1:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%;">1</td><td style="width: 10%;">2</td><td style="width: 10%;">3</td><td style="width: 10%;">4</td><td style="width: 10%;">5</td><td style="width: 10%;">6</td><td style="width: 10%;">7</td><td style="width: 10%;">8</td><td style="width: 10%;">9</td></tr> </table>	1	2	3	4	5	6	7	8	9	
1	2	3	4	5	6	7	8	9			