PMX Step 1: Choose Two Cut Points
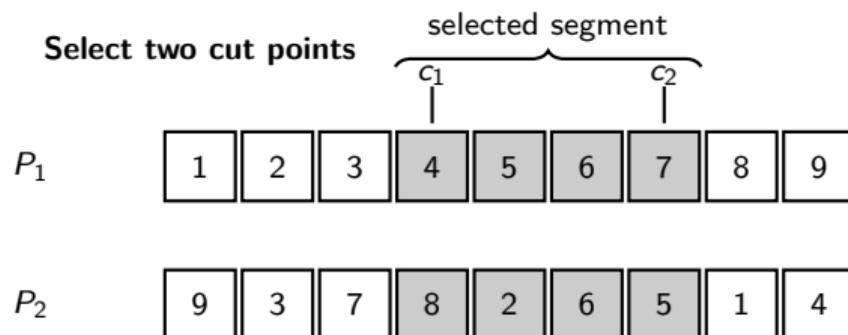
Same cut points in both parents define the block of positions.

Copy the selected segment from P_1
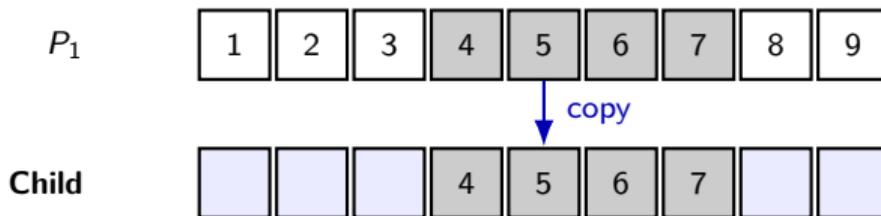
Child now has a fixed block (4–7). Remaining slots are empty.

Scan P_2: which values can fill the empty slots?

Child

			4	5	6	7		

P_2

9	3	7	8	2	6	5	1	4
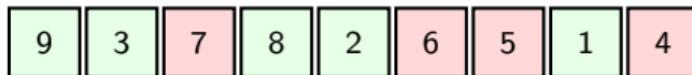
Green = safe (not in copied block $\{4, 5, 6, 7\}$)
Red = conflict (already in the copied block)

Next: use PMX correspondences to *redirect* conflicts.

Select two cut points

selected segment

c_1 c_2

P_1

1	2	3	4	5	6	7	8	9

P_2

| 9	3	7	8	2	6	5	1	4

Context

- Copied segment from P_1 is fixed in the child:
  $$\{4, 5, 6, 7\}$$

- These values **cannot appear elsewhere** in the child.

Attempted placement

- From P_2, we attempt to place value 7.

- Since 7 is already in the copied segment, this is a **conflict**.

PMX repair rule

- Look up the correspondence induced by the copied segment:
  $$7 \leftrightarrow 5, \qquad 5 \leftrightarrow 2$$

- Replace the conflicting value by following the correspondence.
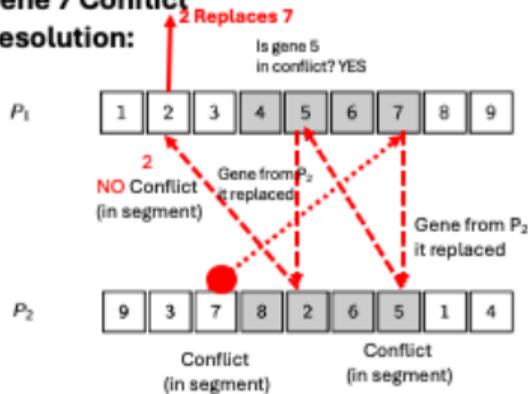
- Continue until a value **not in the segment** is found.

Conflict chain (value-level)
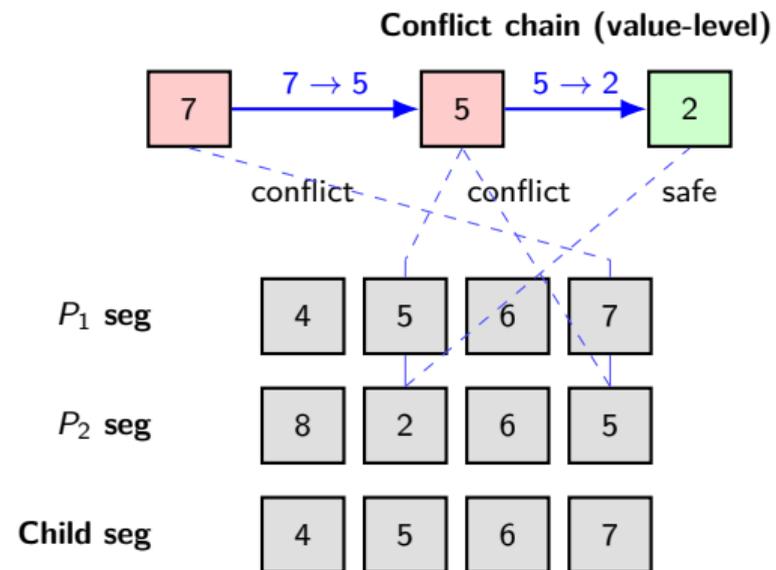
Each arrow follows the correspondence in the copied segment: find the column with the current value in P_1, then read its paired value in P_2.;

Fill balance from P_2: identify and resolve conflict
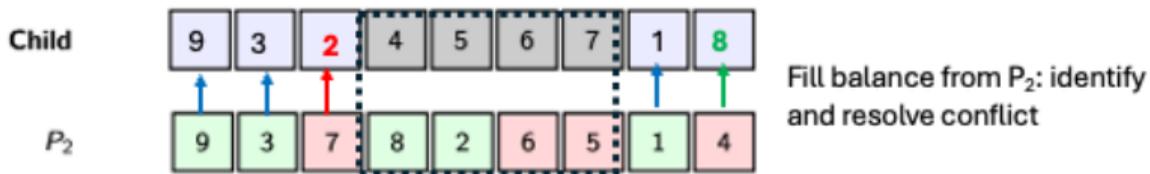
Gene 7 Conflict Resolution:

Gene 4 Conflict Resolution: