

`PassMapping[v, l, p, c, n, a, i]` gives the values that a should be mapped to after a 2-pass has been made at index i , from indices v with all indices l , passing over the list of strands c , in an n -crossing knot with a list of pairs p .

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PassMapping[v_List, l_List, p_List,
  c_List, n_Integer, a_Integer, i_Integer] :=
PassMapping[v, l, p, c, n, a, i] =
If[Length[v ∩ l] == 1,
  Mod[If[MemberQ[v ∪ Join@@c, a],
    If[MemberQ[c[[1]], a],
      a + If[Mod[Abs@p[[1[[1]]]] - i, 2 n] > 1, 1, -1],
      If[MemberQ[c[[2]], a], a +
        If[Mod[Abs@p[[1[[3]]]] - i, 2 n] > 1, 1, -1],
        (1[{2, 1, 4, 3}] + {-1, 1, -1, 1})
        [[Position[1, If[OddQ[1[[1]] + 1[[2]]],
          Total@v - a, a]][[1, 1]]]],
    a], 2 n, 1]
If[MemberQ[v ∪ Join@@c, a] || EvenQ@a,
  If[Mod[a - i, 2 n] ≤ 1 || OddQ@a && ¬ MemberQ[l, a],
    -Sign@p[[a]], 1],
  Sign@p[[a]],
Mod[If[MemberQ[v, a],
  SortBy[Delete[l, FirstPosition[l, #] & /@ v],
    Mod[#, 2] &] [[Mod[a, 2] + 1]],
  a + If[MemberQ[Join@@c, a], 0,
    If[MemberQ[v, l[[Ordering[Mod[a - 1, 2 n, 1]][[
      1]]]], -1, 1]]], 2 n, 1]
If[OddQ@a, Sign@p[[a]] If[MemberQ[v ∪ Join@@c, a],
  1, -1], 1]]];

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