Step-1

Given that there are 12 even permutations of $(1,2,3,4)$, with an even number of exchanges. And two of them are $(1,2,3,4)$ with no exchanges and $(4,3,2,1)$ with two exchanges. We have to list the other ten and instead of writing 4 by 4 matrix, we have use the numbers 4, 3, 2, 1 to give the position of the 1 in each row.

Step-2

The other ten permutations of (1, 2, 3, 4):

With one exchange the permutations are $(2,1,3,4),(1,3,2,4),(1,2,4,3)$

With two exchanges are $(2,1,4,3),(3,1,2,4),(1,3,4,2)$

The other exchange permutations are $(3,1,4,2),(4,1,3,2),(4,3,1,2),(3,4,1,2)$