DESCRIBING WEST-3-STACK-SORTABLE PERMUTATIONS WITH PERMUTATION PATTERNS – ADDENDUM

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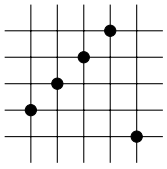
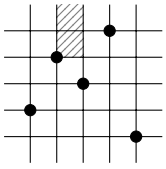
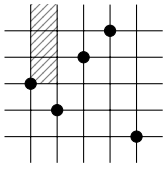
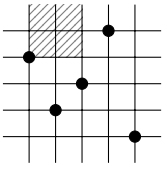
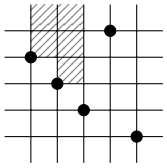
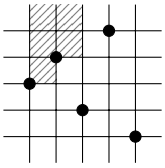
Abstract. This short note contains the list of mesh patterns generated from Theorem 4.6 of *Describing West-3-stack-sortable permutations with permutation patterns* (Seminaire Lotharingien de Combinatoire, Volume 67 (2012), Article B67d), used to check the correctness of the statement of the theorem for permutations of length $n = 5, \ldots, 9$.

From Theorem 4.6 of *Describing West-3-stack-sortable permutations with permutation patterns* (Seminaire Lotharingien de Combinatoire, Volume 67 (2012), Article B67d) we can derive a list of mesh patterns that need to be avoided by a permutation of a given length in order to be West-3-stack-sortable. We do this below for $n = 5, \ldots, 9$.

A permutation π from S_5 is West-3-stack-sortable if and only if it is not one of 23451, 24351, 32451, 42351, 43251 and 34251 (from $I_1, \ldots, I_5$ and $J_{2,12}$).

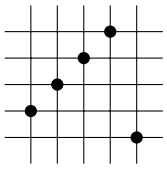
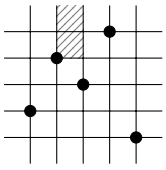
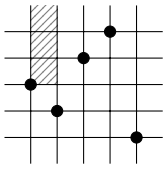
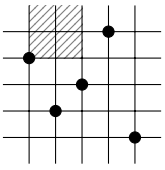
A permutation π from S_6 is West-3-stack-sortable if and only if it avoids the mesh patterns

$I_1 =$  $I_2 =$  $I_3 =$  $I_4 =$ 

$I_5 =$  $J_{2,12} =$ 

and is not one of 362451 (from $J^0_{1,10}$), 364251 (from $J^0_{2,10}$).

A permutation π from S_7 is West-3-stack-sortable if and only if it avoids the mesh patterns

$I_1 =$  $I_2 =$  $I_3 =$  $I_4 =$ 

Key words and phrases. Patterns, Permutations, Sorting.

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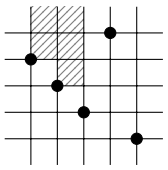
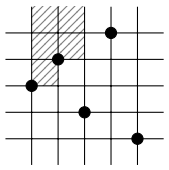
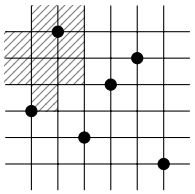
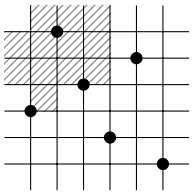
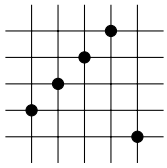
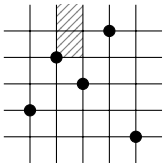
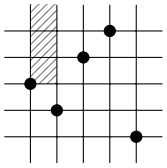
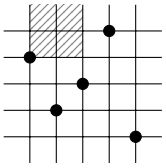
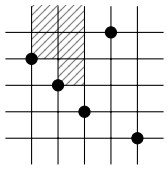
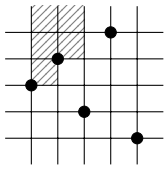
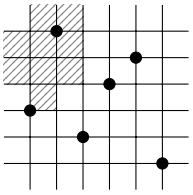
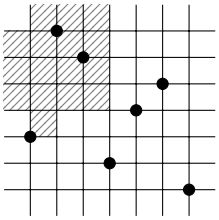
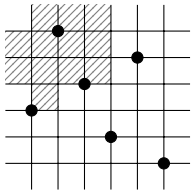
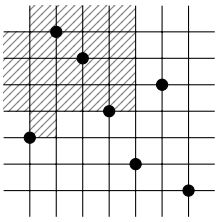
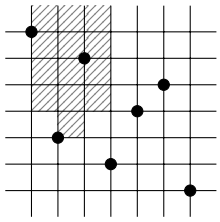
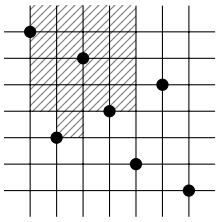
$I_5 =$  $J_{2,12} =$  $J^0_{1,10} =$  $J^0_{2,10} =$ 

and is not one of 3762451 (from $J^1_{1,10}$), 3764251 (from $J^1_{2,10}$), 7362451 (from $J^0_{1,11}$), 7364251 (from $J^0_{2,11}$).

A permutation π from S_8 is West-3-stack-sortable if and only if it avoids the mesh patterns

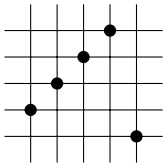
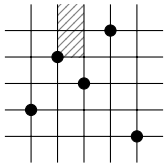
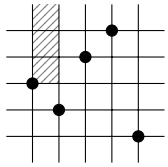
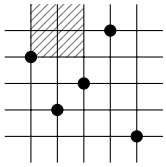
$I_1 =$  $I_2 =$  $I_3 =$  $I_4 =$ 

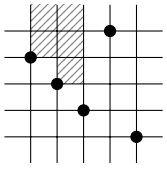
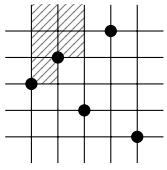
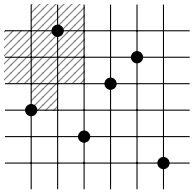
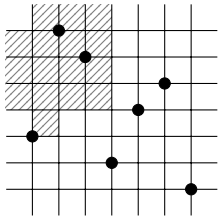
$I_5 =$  $J_{2,12} =$  $J^0_{1,10} =$  $J^1_{1,10} =$ 

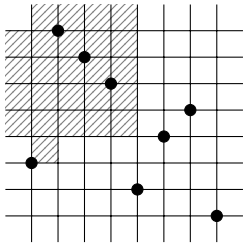
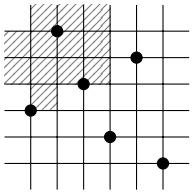
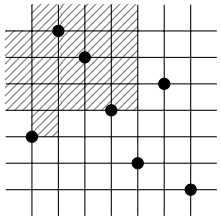
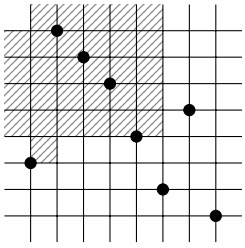
$J^0_{2,10} =$  $J^1_{2,10} =$  $J^0_{1,11} =$  $J^0_{2,11} =$ 

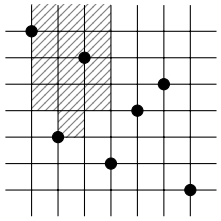
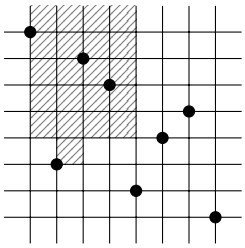
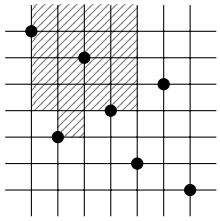
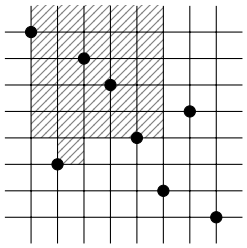
and is not one of 38762451 (from $J^2_{1,10}$), 38764251 (from $J^2_{2,10}$), 83762451 (from $J^1_{1,11}$), 83764251 (from $J^1_{2,11}$).

A permutation π from S_9 is West-3-stack-sortable if and only if it avoids the mesh patterns

$I_1 =$  $I_2 =$  $I_3 =$  $I_4 =$ 

$I_5 =$  $J_{2,12} =$  $J^0_{1,10} =$  $J^1_{1,10} =$ 

$J^2_{1,10} =$  $J^0_{2,10} =$  $J^1_{2,10} =$  $J^2_{2,10} =$ 

$J^0_{1,11} =$  $J^1_{1,11} =$  $J^0_{2,11} =$  $J^1_{2,11} =$ 

and is not one of 398762451 (from $J^3_{1,10}$), 398764251 (from $J^3_{2,10}$), 938762451 (from $J^2_{1,11}$), 938764251 (from $J^2_{2,11}$).

Here, if p is a decorated pattern whose only decorated region is a single box avoiding 12, then the notation p^k is used for the mesh pattern that results from putting exactly k elements in the region.

This list was used to check the correctness of the theorem for $S_5, \ldots, S_9$ in Sage and Haskell[1].

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[1] `www.sagemath.org` and `www.haskell.org`.