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Hecke insertion and maximal increasing and decreasing sequences in fillings of polyominoes

We will give a proof that the number of 01-fillings of a given stack polyomino (a polyomino with justified rows whose lengths form a unimodal sequence) with at most one 1 per column which do not contain a fixed-size northeast chain and a fixed-size southeast chain, depends only on the set of row lengths of the polyomino. The proof is via a bijection between fillings of stack polyominoes which differ only in the position of one row and uses Hecke insertion and jeu de taquin for increasing tableaux. We will discuss how this work relates to other results about chains in fillings of polyominoes as well as graphs and set partitions and mention some possible and impossible extensions.