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Homework 2

Problem 1

Problem 2

Problem 3

Problem 4

Say x is a number in col_n, and y is a number in col_{n+1}.

Case 1: x and y are in the top (least) row, post-sort

$y \leq z$, $\forall z \in col_{n+1}$

$x \leq w$, $\forall w \in col_n$

Because y is in col_{n+1}, it must be greater than at least one elemen in col_n.

As stated, x is the least number in col_n.

Therefore, x is either that number, or less than it.

Case 2: x and y are in the bottom (most) row, post-sort

$y \geq z$, $\forall z \in col_{n+1}$

$x \geq w$, $\forall w \in col_n$

Because x is in col_n, it must be less than at least one element in col_{n+1}.

As stated, y is the greatest number in col_{n+1}.

Therefore, y is either that number, or greater than it.

Case 3: x and y are in any other row

an x and y in row m must have been greater than exactly m other elements in their respective row.

Problem 5

Problem 6