By r/c interchanges, can bring the to entry to a_{11}

$$\left(\begin{array}{c|c} \neq 0 & ? \\ \hline ? & ? \end{array}\right)$$

By multiplying first row by something can get to

$$\left(\begin{array}{c|c} 1 & ? \\ \hline ? & ? \end{array}\right)$$

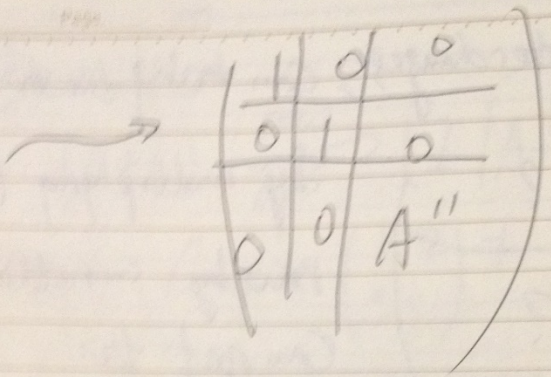
By col ops of type 3, get to

$$\left(\begin{array}{c|ccc} 1 & 0 & 0 & 0 \\ \hline ? & & ? & \end{array}\right)$$

By row ops of type 3, get to

$$\left(\begin{array}{c|ccc} 1 & 0 & 0 & 0 \\ \hline 0 & & & \\ 0 & & A' & \\ 0 & & & \end{array}\right)$$

do the same to A'



Using only row ops

RREF

* the first # entry in every row is a 1. (the "pivot").
* In the column of a pivot, everything else is 0.
* Going down the rows, the pivots are further & further to the right
* all 0 rows are at bottom

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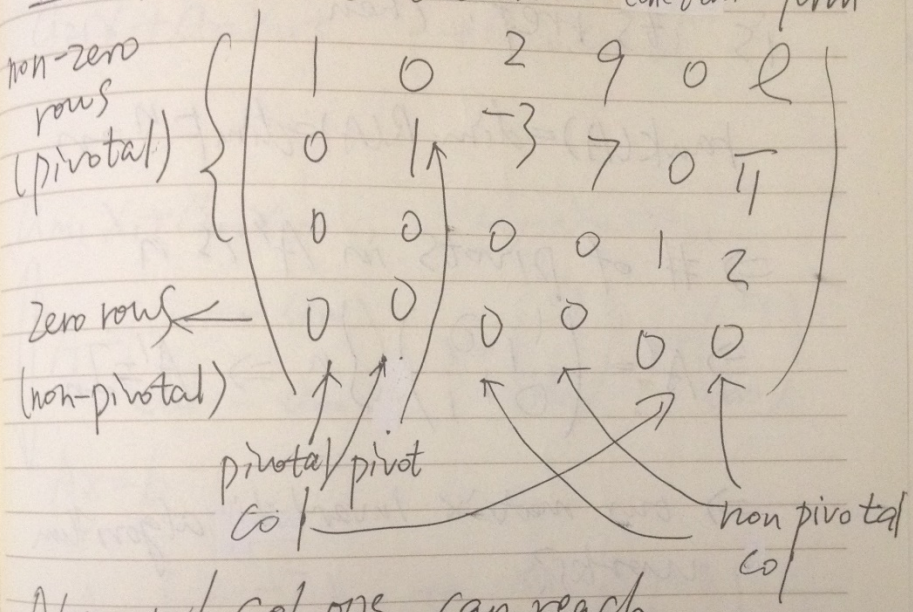
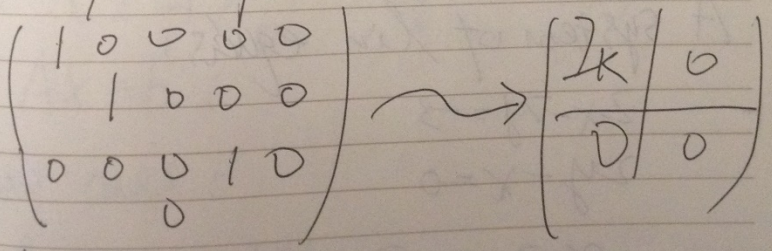
Example "reduced-row-echelon form"



Now w/ col ops can reach



Conclusions:

1. If A is rref, rank(A) is the number of pivots in A