Interpreting Pivot Positions

The tables below organize our understanding of pivot positions of a matrix as to how they convey information about the structure that the matrix represents.

	Information that matrix represents		
Pivot Positions are in	A Coefficient Matrix	A as list of column n-vectors	The Linear transformation T_A
Every row of A	A solution to Ax=b always exists.	The columns of A span R^n .	T_A is onto.
Every column of A	Any solution to Ax=b is unique.	The columns of A are linearly independent.	T_A is 1-to-1.

Here is a supplementary table which addresses the role of pivot positions in the augmented matrix of an equation.

Augmented Matrix [A|b] of the equation Ax=b	
A pivot position is	If and only if
In the right-most column	There is no solution to Ax=b.
In the coefficient matrix	The variable of that column is basic.
Missing from the right-most column	There is a solution to Ax=b.
Missing from a column of the coefficient matrix	The variable of that column is free.