

Re: pivot = leading entry

Source: <http://sci.tech-archive.net/Archive/sci.math/2006-02/msg01353.html>

- *From:* "Zdislav V. Kovarik" <kovarik@xxxxxxxxxxx>
 - *Date:* Wed, 8 Feb 2006 14:04:08 -0500
-

On Tue, 7 Feb 2006, G Patel wrote:

My Lin Alg prof uses "pivot column" and "leading entry column" interchangeably all the time. She even says "pivot, or leading entry if you like" vice versa a lot.

The text we use doesn't really explain pivots, and when it did lightly touch on it, it was explained as a number used to zap zeros in all the entries below it in the column. If that is the case, then the pivot entries should be a subset (sometimes proper subset) of the set of leading entries.

Am I right? Because sometimes when doing the pivotting, other entries in other columns are zapped to zero, creating a leading entry automatically with zeros below it (thus not needing to use this leading entry at any time for pivotting)

Is my reasoning correct? Thanks for the help.

I detect loose use of terminology (or conventions).

"Leading" often applies to the first non-zero entry in a list (the entry 2 in $[0, 0, 2, 77, 338, 5]$), and on other occasions it applies to the zeros at the beginning of the list (the expansion $.00006303$ has 4 leading zeros). Personally, I saw it best applied to "leading ones" in the echelon form of a matrix.

"Pivot" is, in computational linear algebra, a chosen entry below which the matrix entries are to be "zapped" to zero, after a possible interchange of rows, either actually performed or symbolically stored.

In some orthogonal transformation methods, one can talk about a "pivot column", the one with largest magnitude within a submatrix to be processed.

Re: pivot = leading entry

The distinction: A frequently recommended pivot is the largest entry in the column that is being processed (it may reduce the risk of large errors). But there can be other criteria (in linear programming, it is the result of other magnitude decisions).

The distinction is obvious: if rounding errors are not an issue, a pivot may (or may not) be the leading non-zero entry. (And in introductory linear algebra, they are indeed not an issue.)

As a fresh graduate, I listened to a lecture by a German professor about the pivoting strategies; he pronounced "pivot" with a silent "t". In Slavic languages, "pivo" means beer, so we (Czechs and Slovaks in the audience) were delighted that he emphasized the importance of a proper choice of a "pivo element".

Cheers, ZVK(Slavek).

.