

SECOND WXMAXIMA PROJECT

1. Here are two sets of vectors in \mathbb{R}^5 . One is linearly independent, and one is linearly dependent. Which is which? Answer this two different ways: with maxima's "rank" function and with maxima's "determinant" function. Explain what both answers mean.

$\{(11, 24, 31, 32, 43), (67, 45, 54, 5, 6), (3164, 2743, -75, 607, 3649), (87, 82, 24, 15, 91), (47, 94, 179, 14, 19)\}$

$\{(11, 24, 31, 32, 43), (67, 45, 54, 5, 6), (3164, 2742, -75, 607, 3649), (87, 82, 24, 15, 91), (47, 94, 179, 14, 19)\}$

The next two problems refer to the set of vectors that is linearly dependent.

2. What is the largest linearly independent subset of this set of vectors? Use the "echelon" function in maxima to do this. After all, you only need to observe the row echelon form of a matrix to know if the (rows? columns? both?) are linearly independent.

3. Since the vectors are linearly dependent, you should be able to find a non-trivial linear combination of the vectors which is equal to $(0, 0, 0, 0, 0)$. First put an appropriate matrix in reduced row echelon form. Then use it to find a linear combination whose scalars are all integers.

Save your work as yourlastname.wxm. (For example, if your last name is Smith, rather than yourlastname, your project should be saved as smith.wxm.) **Please include text cells to explain your work.**