

Range and Null Space

The program finds a basis for the range and null spaces of a real valued $m \times n$ matrix. The calling statement is

$$rnsp(mat, "r", "n")$$

where mat is the matrix and r is the name of a variable in which the program will deliver a matrix whose columns form a base for the range space of mat and n is a matrix whose columns form a base for the null space of mat

Example. We store in a the matrix

$$a = \begin{bmatrix} 3 & 1 & 2 & 1 & 2 \\ 1 & 2 & -3 & 0 & 5 \\ 2 & -1 & 5 & 1 & -3 \\ 1 & 2 & 1 & 1 & 1 \end{bmatrix}$$

Then we run the program using the instruction

$$rnsp(a, "o1", "o2")$$

The following screen show the result of the computation.

F1	F2	F3	F4	F5	F6
Algebra	Calc	Other	PrgmIO	Clean Up	

prog\rnsp(a, "o1", "o2")

Done

o1

1 0 0

0 1 0

1 -1 0

0 0 1

o1			
MAIN	RAD AUTO	FUNC 2/30	

The screen shows the matrix $o1$ whose columns form a base for the range. The next screen shows a base for the null space of a .

F1	F2	F3	F4	F5	F6
Algebra	Calc	Other	PrgmIO	Clean Up	
					1 -1 0
					0 0 1
					1 0 0
					0 1
					-9/8 7/8
					1 -3
					-7/8 1/8
o2					
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