Row Reducing a Matrix - the Algorithm

```matlab
>> A = [1 3 4 7;3 9 7 6];
>> rrefstory(A)
All data is considered rational.
The matrix to be row reduced is

A = 1 3 4 7
   3 9 7 6

********************
Type in a one character command as requested and hit enter or return.
r or R  reset to original matrix.
f or F  next step in row reduction process.
b or B  last step in row reduction process.
g or G  row reduced echelon form.
v or V  view the command list.
a or A  autoplay to row reduced form.
q or Q  quit.
********************
Enter r, f, g, a, v, or q -> a
Pivot at (1,1)
Swap rows 1 and 2
A([1,2],1:end) = A([2,1],1:end)

A = <3> 9 7 6
   1 3 4 7

********************
Pivot at (1,1)
Scale row 1 by 1/3
A(1,1:end) = A(1,1:end)/A(1,1)

A = <1> 3 7/3 2
   1 3 4 7

********************
Pivot at (1,1)
Multiply row 1 by 1 and subtract it from row 2
A(2,1:end) = A(2,1:end) - A(2,1)*A(1,1:end)

A = <1> 3 7/3 2
   0 0 5/3 5

********************
```
Pivot at (2,3)
Scale row 2 by 3/5
A(2,3:end) = A(2,3:end)/A(2,3)

A = 1 3 7/3 2
0 0 <1> 3
********************

Pivot at (2,3)
Multiply row 2 by 7/3 and subtract it from row 1
A(1,3:end) = A(1,3:end) - A(1,3)*A(2,3:end)

A = 1 3 0 -5
0 0 <1> 3
********************
The row reduced form of A is

rref(A) = 1 3 0 -5
0 0 1 3
********************
Enter r, b, v, or q ->q

---------------------------------------------------------------------------------------------

Without row swaps

1 3 4 7         pivot at (1,1)
3 9 7 6
*** *** ***
1 3 4 7         eliminate below pivot
0 0 -5 -15
*** *** ***
1 3 4 7         rescale second row
0 0 1 3         pivot at (2,3)
*** *** ***
*** *** ***
1 3 0 -5         eliminate above current pivot
0 0 1 3
*** *** ***

MATLAB check:
» disp(int2str(rref(A)))
1 3 0 -5
0 0 1 3