1 Forward Step: Example 1

```
The matrix is currently:
[[ 0.  0.  1.  0.  2.]
 [ 1.  0.  2.  3.  4.]
 [ 3.  0.  4.  2.  1.]
 [ 1.  0.  1.  1.  2.]]
Now looking at row 0
Swapping rows 0 and 1 so that entry 0 in the current row is non-zero
The matrix is currently:
[[ 1.  0.  2.  3.  4.]
 [ 0.  0.  1.  0.  2.]
 [ 3.  0.  4.  2.  1.]
 [ 1.  0.  1.  1.  2.]]
Adding row 0 to rows below it to eliminate coefficients in column 0
The matrix is currently:
[[  1.   0.   2.   3.   4.]
 [  0.   0.   1.   0.   2.]
 [  0.   0.  -2.  -7. -11.]
 [  0.   0.  -1.  -2.  -2.]]
================================================================================
Now looking at row 1
Swapping rows 1 and 1 so that entry 2 in the current row is non-zero
The matrix is currently:
[[  1.   0.   2.   3.   4.]
 [  0.   0.   1.   0.   2.]
 [  0.   0.  -2.  -7. -11.]
 [  0.   0.  -1.  -2.  -2.]]
Adding row 1 to rows below it to eliminate coefficients in column 2
The matrix is currently:
[[ 1.  0.  2.  3.  4.]
 [ 0.  0.  1.  0.  2.]
 [ 0.  0.  0. -7. -7.]
 [ 0.  0.  0. -2.  0.]]
================================================================================
Now looking at row 2
Swapping rows 2 and 2 so that entry 3 in the current row is non-zero
The matrix is currently:
[[ 1.  0.  2.  3.  4.]
 [ 0.  0.  1.  0.  2.]
 [ 0.  0.  0. -7. -7.]
 [ 0.  0.  0. -2.  0.]]
Adding row 2 to rows below it to eliminate coefficients in column 3
The matrix is currently:
[[ 1.  0.  2.  3.  4.]
 [ 0.  0.  1.  0.  2.]
 [ 0.  0.  0. -7. -7.]
 [ 0.  0.  0.  0.  2.]]
```

```
================================================================================
Now looking at row 3
Swapping rows 3 and 3 so that entry 4 in the current row is non-zero
The matrix is currently:
[[ 1.  0.  2.  3.  4.]
 [ 0.  0.  1.  0.  2.]
 [ 0.  0.  0. -7. -7.]
 [ 0.  0.  0.  0.  2.]]
Adding row 3 to rows below it to eliminate coefficients in column 4
The matrix is currently:
[[ 1.  0.  2.  3.  4.]
 [ 0.  0.  1.  0.  2.]
 [ 0.  0.  0. -7. -7.]
 [ 0.  0.  0.  0.  2.]]
================================================================================
Done with the forward step
The matrix is currently:
[[ 1.  0.  2.  3.  4.]
 [ 0.  0.  1.  0.  2.]
 [ 0.  0.  0. -7. -7.]
 [ 0.  0.  0.  0.  2.]]
```

2 Forward Step and Backward Step: Example 2

```
The matrix is currently:
[[  1  -2   3  22]
 [  3  10   1 314]
 [  1   5   3  92]]
================================================================================
Now performing the forward step
Now looking at row 0
Swapping rows 0 and 0 so that entry 0 in the current row is non-zero
The matrix is currently:
[[  1  -2   3  22]
 [  3  10   1 314]
 [  1   5   3  92]]
================================================================================
Adding row 0 to rows below it to eliminate coefficients in column 0
The matrix is currently:
[[   1.   -2.    3.   22.]
 [   0.   16.   -8.  248.]
 [   0.    7.    0.   70.]]
================================================================================
Now looking at row 1
Swapping rows 1 and 1 so that entry 1 in the current row is non-zero
The matrix is currently:
[[   1.   -2.    3.   22.]
 [   0.   16.   -8.  248.]
 [   0.    7.    0.   70.]]
================================================================================
Adding row 1 to rows below it to eliminate coefficients in column 1
The matrix is currently:
[[   1.    -2.     3.    22. ]
 [   0.    16.    -8.   248. ]
 [   0.     0.     3.5  -38.5]]
================================================================================
Now looking at row 2
Swapping rows 2 and 2 so that entry 2 in the current row is non-zero
The matrix is currently:
[[   1.    -2.     3.    22. ]
 [   0.    16.    -8.   248. ]
 [   0.     0.     3.5  -38.5]]
================================================================================
Adding row 2 to rows below it to eliminate coefficients in column 2
The matrix is currently:
[[   1.    -2.     3.    22. ]
 [   0.    16.    -8.   248. ]
 [   0.     0.     3.5  -38.5]]
================================================================================
The matrix is currently:
```

```
[[   1.    -2.     3.    22. ]
 [   0.    16.    -8.   248. ]
 [   0.     0.     3.5  -38.5]]
================================================================================
Now performing the backward step
Adding row 2 to rows above it to eliminate coefficients in column 2
The matrix is currently:
[[   1.    -2.     0.    55. ]
 [   0.    16.     0.   160. ]
 [   0.     0.     3.5  -38.5]]
================================================================================
Adding row 1 to rows above it to eliminate coefficients in column 1
The matrix is currently:
[[   1.     0.     0.    75. ]
 [   0.    16.     0.   160. ]
 [   0.     0.     3.5  -38.5]]
================================================================================
Adding row 0 to rows above it to eliminate coefficients in column 0
The matrix is currently:
[[   1.     0.     0.    75. ]
 [   0.    16.     0.   160. ]
 [   0.     0.     3.5  -38.5]]
================================================================================
Now dividing each row by the leading coefficient
The matrix is currently:
[[  1.   0.   0.  75.]
 [  0.   1.   0.  10.]
 [  0.   0.   1. -11.]]
================================================================================
```