1 Forward Step: Example 1

```
The matrix is currently:
[[ 0. 0. 1. 0.
                2.1
[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:
ΓΓ 1.
      0.
           2.
                3.
                    4.1
Γ0.
       0.
           1.
                0.
                    2.1
Γ0.
      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.]
ΓΟ.
       0. 1.
                0.
                    2.1
[ 0.
       0. -2. -7. -11.]
   0.
       0. -1. -2. -2.]]
Г
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.]
\begin{bmatrix} 0. & 0. & 0. & -7. & -7. \end{bmatrix}
[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. 077.]
[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. 077.]
[0. 0. 0. 0. 2.]]
Done with the forward step
The matrix is currently:
$\begin{bmatrix} 1. & 0. & 2. & 3. & 4. \end{bmatrix}$
[0. 0. 1. 0. 2.]
$\begin{bmatrix} 0 & 0 & -7 & -7 \end{bmatrix}$

Lab #7

2 Forward Step and Backward Step: Example 2

```
The matrix is currently:
  1 -2
       3 22]
ΓΓ
[ 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]
       3 92]]
۲ I
     5
Adding row 0 to rows below it to eliminate coefficients in column 0
The matrix is currently:
]]]
   1.
      -2.
           З.
              22.]
Γ
   0.
      16. -8. 248.]
Γ
   0.
      7.
           0.
              70.11
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.]
Γ
   0.
      16.
          -8.
              248.1
Г
       7.
              70.]]
   0.
           0.
_____
Adding row 1 to rows below it to eliminate coefficients in column 1
The matrix is currently:
ΓΓ
   1.
      -2.
           З.
                22. ]
Γ
       16.
                248. ]
   0.
           -8.
Г
   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.
            З.
                22. ]
                248.]
Γ
   0.
       16.
           -8.
Γ
   0.
       0.
            3.5 -38.5]]
_____
Adding row 2 to rows below it to eliminate coefficients in column 2
The matrix is currently:
[]]
       -2.
   1.
            З.
                22. ]
Γ
   0.
       16.
           -8.
               248. ]
Γ
           3.5 -38.5]]
   0.
       0.
  _____
The matrix is currently:
```

22.]]]] 1. -2. 3. 0. 16. 248.] Γ -8. Γ 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: 55.1 ΓΓ 1. -2. 0. Γ 0. 16. 0. 160.] Γ 0. 0. 3.5 -38.5]] _____ Adding row 1 to rows above it to eliminate coefficients in column 1 The matrix is currently: 0. 75.] [[1. 0. Γ 0. 16. 0. 160.] Γ 0. 0. 3.5 -38.5]] _____ Adding row 0 to rows above it to eliminate coefficients in column 0 The matrix is currently: ΓΓ 1. 0. 0. 75.1 16. Γ 0. 0. 160.] Γ 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.]] _____