```
//Gauss Elimination
#include<iostream>
#include<iomanip>
using namespace std;
int main()
{
    int n,i,j,k;
    cout.precision(4);        //set precision
    cout.setf(ios::fixed);
    cout<<"\nEnter the no. of equations\n";
    cin>>n;                //input the no. of equations
    float a[n][n+1],x[n];        //declare an array to store the elements of augmented-
matrix
    cout<<"\nEnter the elements of the augmented-matrix row-wise:\n";
    for (i=0;i<n;i++)
        for (j=0;j<=n;j++)
            cin>>a[i][j];    //input the elements of array
    for (i=0;i<n;i++)                    //Pivotisation
        for (k=i+1;k<n;k++)
            if (abs(a[i][i])<abs(a[k][i]))
                for (j=0;j<=n;j++)
                {
                    double temp=a[i][j];
                    a[i][j]=a[k][j];
                    a[k][j]=temp;
                }
    cout<<"\nThe matrix after Pivotisation is:\n";
    for (i=0;i<n;i++)            //print the new matrix
    {
        for (j=0;j<=n;j++)
            cout<<a[i][j]<<setw(16);
        cout<<"\n";
    }
    for (i=0;i<n-1;i++)            //loop to perform the gauss elimination
        for (k=i+1;k<n;k++)
            {
                double t=a[k][i]/a[i][i];
                for (j=0;j<=n;j++)
                    a[k][j]=a[k][j]-t*a[i][j];    //make the elements below the pivot
elements equal to zero or elimnate the variables
            }
    cout<<"\n\nThe matrix after gauss-elimination is as follows:\n";
    for (i=0;i<n;i++)            //print the new matrix
    {
        for (j=0;j<=n;j++)
            cout<<a[i][j]<<setw(16);
        cout<<"\n";
    }
    for (i=n-1;i>=0;i--)                //back-substitution
    {                        //x is an array whose values correspond to the values of
x,y,z..
```

```
        x[i]=a[i][n];                //make the variable to be calculated equal to the
rhs of the last equation
        for (j=i+1;j<n;j++)
            if (j!=i)            //then subtract all the lhs values except the
coefficient of the variable whose value                                    is being
calculated
                x[i]=x[i]-a[i][j]*x[j];
        x[i]=x[i]/a[i][i];            //now finally divide the rhs by the coefficient
of the variable to be calculated
    }
    cout<<"\nThe values of the variables are as follows:\n";
    for (i=0;i<n;i++)
        cout<<x[i]<<endl;            // Print the values of x, y,z,....
    return 0;
}
```

```
The matrix after Pivotisation is:
6.0000          1.0000         -6.0000         -5.0000          6.0000
0.0000          2.0000          0.0000          1.0000          0.0000
2.0000          2.0000          3.0000          2.0000         -2.0000
4.0000         -3.0000          0.0000          1.0000         -7.0000


The matrix after gauss-elimination is as follows:
6.0000          1.0000         -6.0000         -5.0000          6.0000
0.0000          2.0000          0.0000          1.0000          0.0000
0.0000          0.0000          5.0000          2.8333         -4.0000
0.0000          0.0000         -0.0000          3.9000         -7.8000

The values of the variables are as follows:
-0.5000
1.0000
0.3333
-2.0000
```

Sample 1

```
The matrix after Pivotisation is:
4.0000          -2.0000          1.0000          15.0000
-3.0000          -1.0000          4.0000          8.0000
1.0000          -1.0000          3.0000          13.0000


The matrix after gauss-elimination is as follows:
4.0000          -2.0000          1.0000          15.0000
0.0000          -2.5000          4.7500          19.2500
0.0000           0.0000          1.8000          5.4000

The values of the variables are as follows:
2.0000
-2.0000
3.0000
```

Sample 2

Tutorial Video:

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I'm a physicist specializing in computational material science with a PhD in Physics from Friedrich-Schiller University Jena, Germany. I write efficient codes for simulating light-matter interactions at atomic scales. I like to develop Physics, DFT, and Machine Learning related apps and software from time to time. Can code in most of the popular languages. I like to share my knowledge in Physics and applications using this Blog and a YouTube channel.

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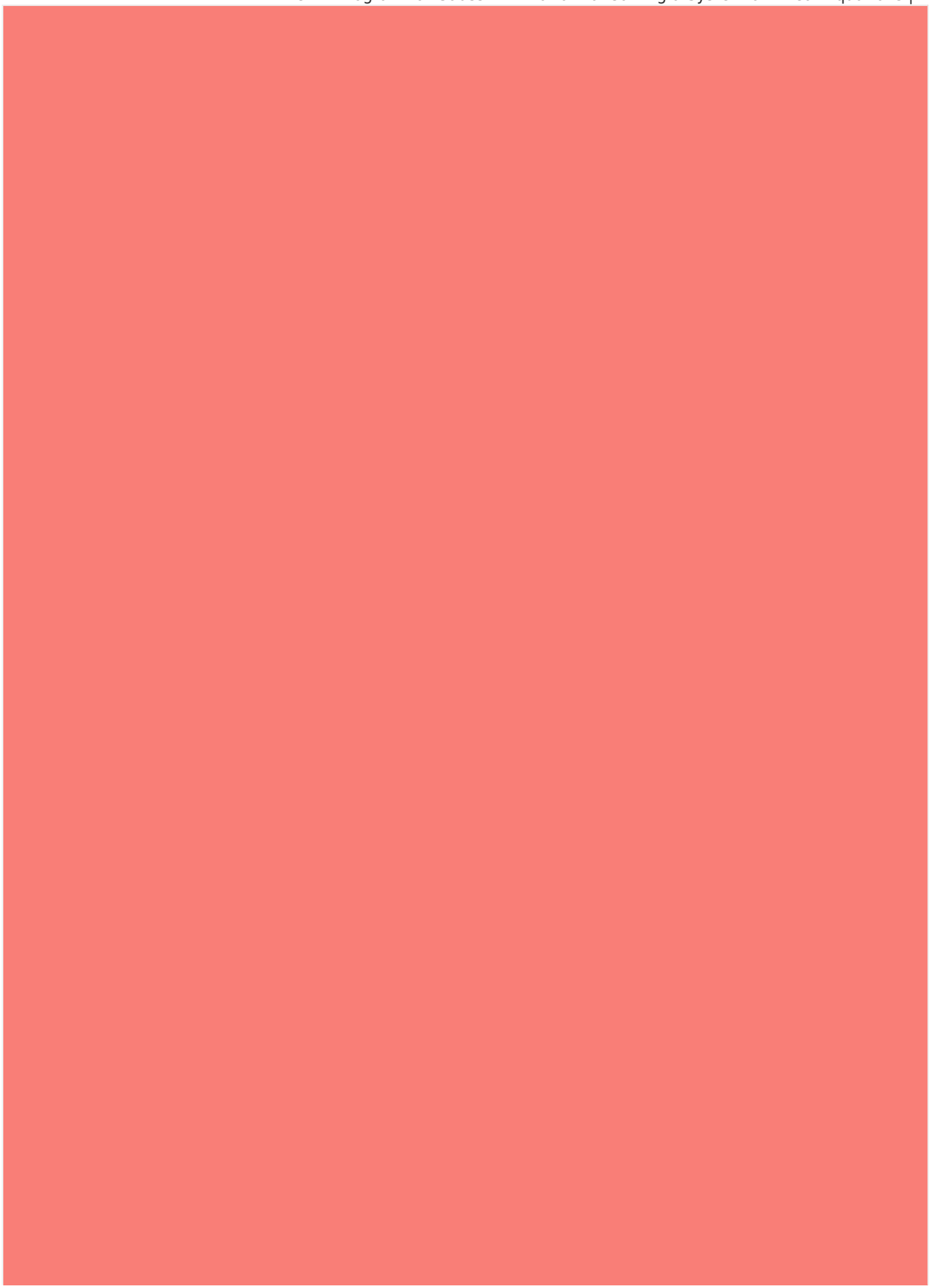

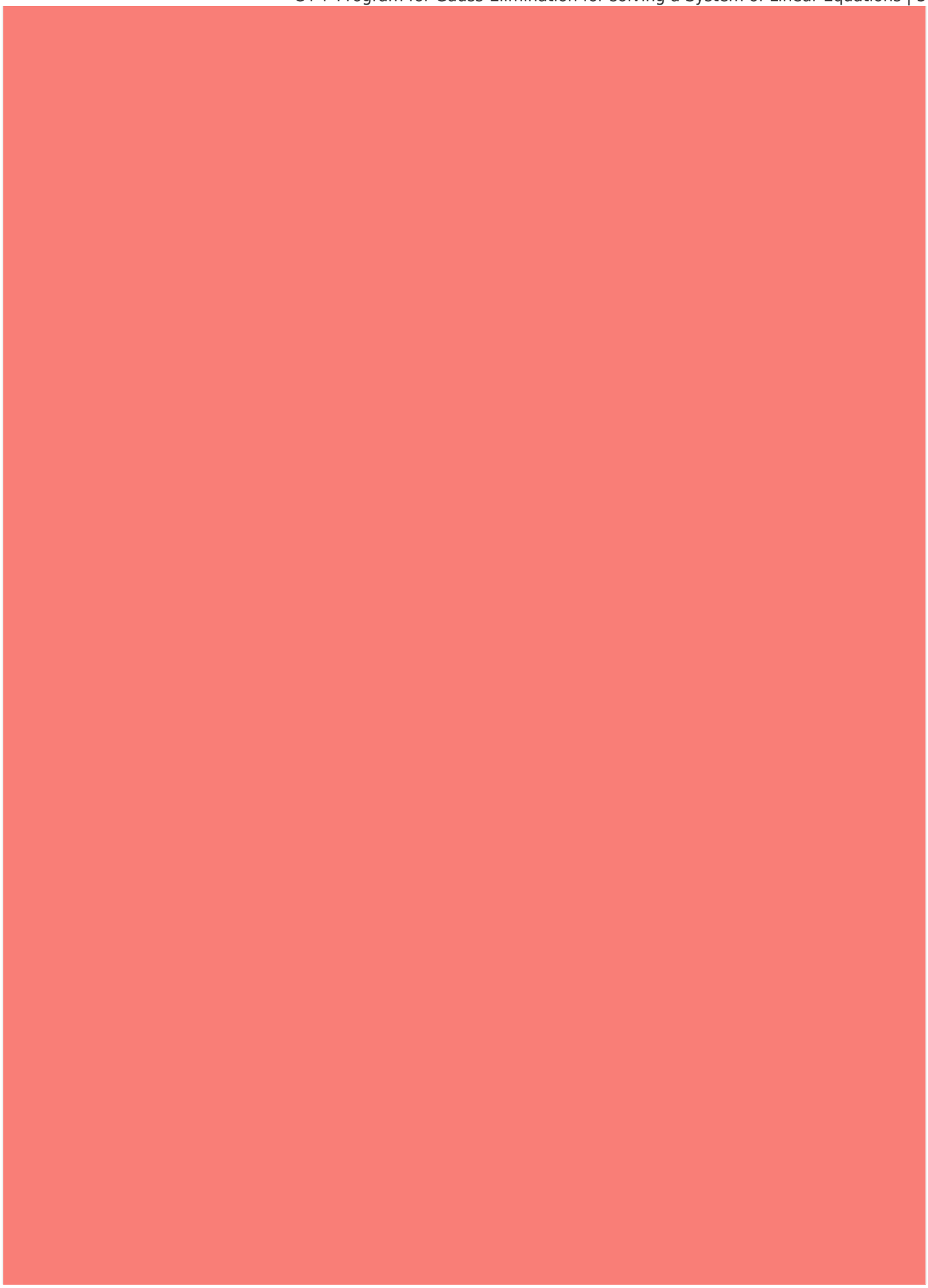

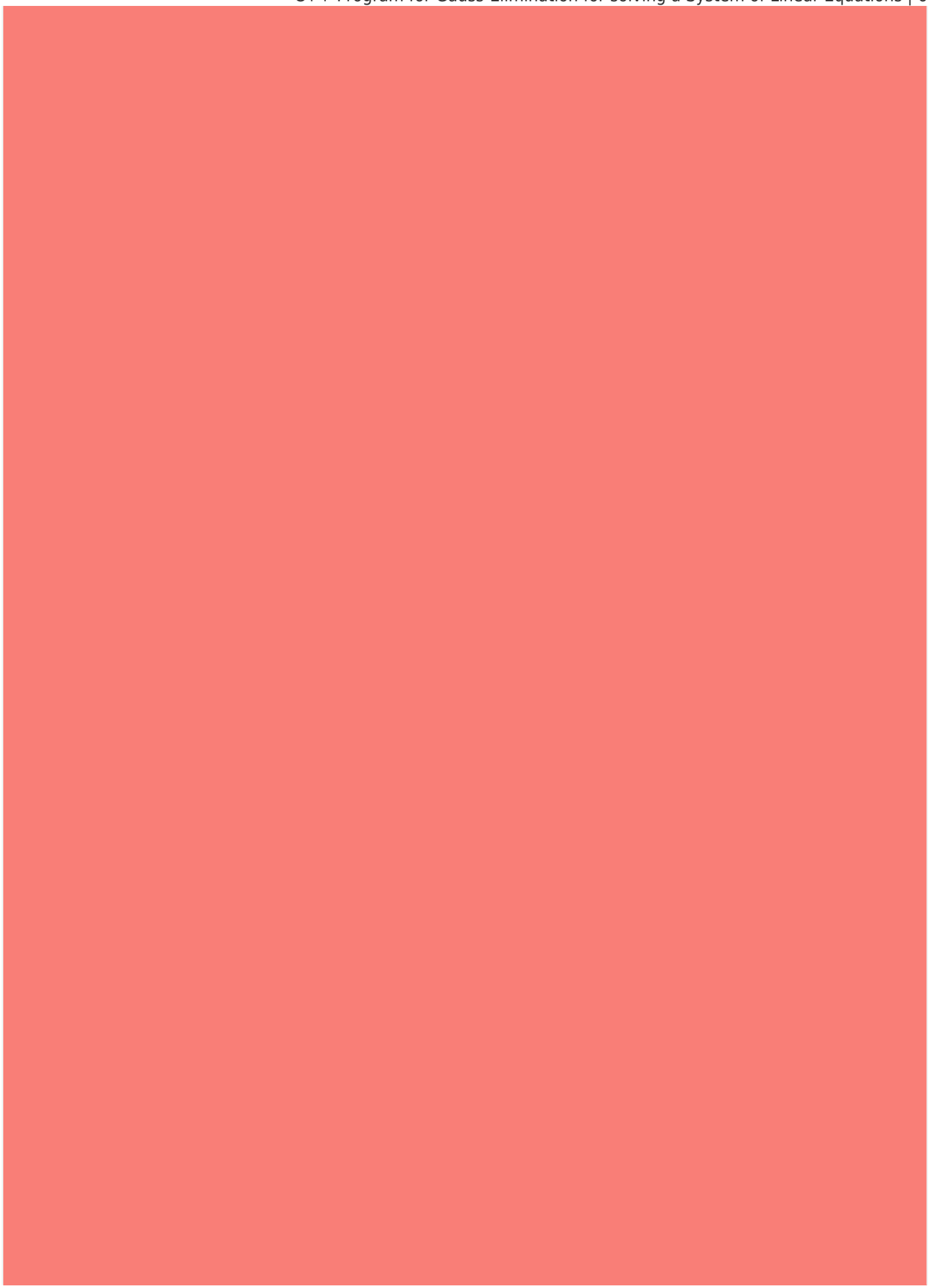

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