

4.Gauss Elimination Method:

```
/* Name: Poorvi Agarwal
```

```
Section:G Roll No.:02
```

```
College ID: 20022029
```

```
University Roll No.: 2016897
```

```
*/
```

```
#include<stdio.h>
```

```
#include <stdbool.h>
```

```
#include <string.h>
```

```
#include<stdlib.h>
```

```
int main()
```

```
{
```

```
    printf("Name: Poorvi Agarwal\nSection:G Roll No.:02\nCollege ID: 20022029\nUniversity Roll No.:  
2016897\n\n");
```

```
    int n,m,i,j,k;
```

```
    float a[100][101]={0};
```

```
    printf("Enter the number of equations: ");
```

```
    scanf("%d",&n);
```

```
    int idx=0;
```

```
    int xyz=0;
```

```
    while(n--)
```

```
    {
```

```
        char s[200];
```

```
        printf("Enter the equation:\n");
```

```
        scanf("%s",s);
```

```
        bool flag=false;
```

```
        int num=0;
```

```
        int cont=0;
```

```
        int sign=1;
```

```
        for(int i=0;i<strlen(s);i++)
```

```

{
    if(flag&&(s[i]>='0'&&s[i]<='9'))
    {
        cont=cont*10+(s[i]-'0');

    }
    if(s[i]=='=')
        flag=true;

    else if(s[i]=='-')
        sign=-1;

    else if(s[i]=='x')
    {
        if(sign==1&&num==0)
        {
            num=1;
        }
        a[idx][0]=sign*num==0?1:sign*num;
        num=0;
        xyz++;
        sign=1;
    }
    else if(s[i]=='y')
    {
        if(sign==1&&num==0)
        {
            num=1;
        }
        a[idx][1]=sign*num==0?1:sign*num;
        num=0;
    }
}

```

```

        if(xyz==0)

            a[idx][0]=0;

            xyz++;

            sign=1;
    }
    else if(s[i]=='z')
    {
        if(sign==-1&&num==0)

            {

                num=1;

            }

        a[idx][2]=sign*num==0?1:sign*num;

        num=0;

        if(xyz==0)

            {

                a[idx][0]=0;

                a[idx][1]=0;

            }

        if(xyz==1)

            {

                if(a[idx][1]=='\0')

                    a[idx][1]=0;

                else

                    a[idx][0]=0;

            }

        sign=1;

        xyz++;

    }

    else if(s[i]>='0'&&s[i]<='9')

    {

        num=num*10+(s[i]-'0');
    }

```

```

    }
}
a[idx][3]=sign*cont;
idx++;
}
float t;
printf("Equation 1: (%.0f)x+(%.0f)y+(%.0f)z=%.0f\n", a[0][0], a[0][1], a[0][2], a[0][3]);
printf("Equation 2: (%.0f)x+(%.0f)y+(%.0f)z=%.0f\n", a[1][0], a[1][1], a[1][2], a[1][3]);
printf("Equation 3: (%.0f)x+(%.0f)y+(%.0f)z=%.0f\n", a[2][0], a[2][1], a[2][2], a[2][3]);
printf("\n\n");
printf("Augmented Matrix: \n");
for (i=0;i<3;i++)
{
    for (j=0;j<4;j++)
    {
        printf("%.2f ",a[i][j]);
    }
    printf("\n");
}
printf("\n");
for(int j=0;j<3;j++)
{
    for(int i=0;i<3;i++)
    {
        if(i>j)
        {
            t=a[i][j]/a[j][j];
            for(k=0;k<4;k++)
            {
                a[i][k]=a[i][k]-t*a[j][k];
            }
        }
    }
}

```

```

    }
}
}
printf("Final Matrix form : \n");
for (i=0;i<3;i++)
{
    for (j=0;j<4;j++)
    {
        printf("\t %.2f", a[i][j]);
    }
    printf("\n");
}
n=2;
float sum=0.0;
float x[n];
x[n]=a[n][n+1]/a[n][n];

for(i=n-1;i>=0;i--)
{
    sum=0;
    for(j=i+1;j<=n;j++)
    {

        sum=sum+a[i][j]*x[j];

    }

    x[i]=(a[i][n+1]-sum)/a[i][i];

}
printf("\n\nValues are :\n");

```

```
for(i=0;i<=n;i++)  
{  
    printf("x%d = %.2f\n",i,x[i]);  
}  
}
```

Output:

```
"F:\c_programming\CBNST LAB\elimination.exe"
Enter the equation:
2x+y+z=10
Enter the equation:
3x+2y+3z=18
Enter the equation:
x+4y+9z=16
Equation 1: (2)x+(1)y+(1)z=10
Equation 2: (3)x+(2)y+(3)z=18
Equation 3: (1)x+(4)y+(9)z=16

Augmented Matrix:
2.00 1.00 1.00 10.00
3.00 2.00 3.00 18.00
1.00 4.00 9.00 16.00

Final Matrix form :
      2.00    1.00    1.00    10.00
      0.00    0.50    1.50     3.00
      0.00    0.00   -2.00   -10.00

Values are :
x0 = 7.00
x1 = -9.00
x2 = 5.00

Process returned 0 (0x0)   execution time : 33.641 s
Press any key to continue.
```

5.Gauss Jordan Method:

```
/* Name: Poorvi Agarwal
```

```
Section:G Roll No.:02
```

```
College ID: 20022029
```

```
University Roll No.: 2016897
```

```
*/
```

```
#include<stdio.h>
```

```
#include <stdbool.h>
```

```
#include <string.h>
```

```
#include<stdlib.h>
```

```
int main()
```

```
{
```

```
    int n;
```

```
    printf("Name: Poorvi Agarwal\nSection:G Roll No.:02\nCollege ID: 20022029\nUniversity Roll No.:  
2016897\n\n");
```

```
    float a[100][101]={0};
```

```
    printf("Enter the number of equations: ");
```

```
    scanf("%d",&n);
```

```
    int idx=0;
```

```
    int xyz=0;
```

```
    while(n--)
```

```
    {
```

```
        char s[200];
```

```
        printf("Enter the equation:\n");
```

```
        scanf("%s",s);
```

```
        bool flag=false;
```

```
        int num=0;
```

```
        int cont=0;
```

```
        int sign=1;
```

```
        for(int i=0;i<strlen(s);i++)
```

```
        {
```



```

if(flag&&(s[i]>='0'&&s[i]<='9'))
{
    cont=cont*10+(s[i]-'0');

}
if(s[i]=='=')
    flag=true;

else if(s[i]=='-')
    sign=-1;

else if(s[i]=='x')
{
    if(sign==-1&&num==0)
    {
        num=1;
    }
    a[idx][0]=sign*num==0?1:sign*num;
    num=0;
    xyz++;
    sign=1;
}
else if(s[i]=='y')
{
    if(sign==-1&&num==0)
    {

        num=1;
    }
    a[idx][1]=sign*num==0?1:sign*num;
    num=0;

```

```
    if(xyz==0)
        a[idx][0]=0;
        xyz++;
        sign=1;
    }
    else if(s[i]=='z')
    {
        if(sign==1&&num==0)
        {
            num=1;
        }

        a[idx][2]=sign*num==0?1:sign*num;
        num=0;
        if(xyz==0)
        {
            a[idx][0]=0;
            a[idx][1]=0;
        }
        if(xyz==1)
        {
            if(a[idx][1]!='\0')
                a[idx][1]=0;
            else
                a[idx][0]=0;
        }
        sign=1;
        xyz++;
    }
    else if(s[i]>='0'&&s[i]<='9')
    {
```

```

        num=num*10+(s[i]-'0');
    }
}
a[idx][3]=sign*cont;
idx++;
}
float t;
int i , j, k;
printf("Equation 1: (%.0f)x+(%.0f)y+(%.0f)z=%.0f\n", a[0][0], a[0][1], a[0][2], a[0][3]);
printf("Equation 2: (%.0f)x+(%.0f)y+(%.0f)z=%.0f\n", a[1][0], a[1][1], a[1][2], a[1][3]);
printf("Equation 3: (%.0f)x+(%.0f)y+(%.0f)z=%.0f\n", a[2][0], a[2][1], a[2][2], a[2][3]);
printf("\n\n");
printf("Augmented Matrix: \n");
for (i=0;i<3;i++)
{
    for (j=0;j<4;j++)
    {
        printf("%.2f ",a[i][j]);
    }
    printf("\n");
}
printf("\n");
for (i=0;i<3;i++)
{
    for (j=0;j<3;j++)
    {
        if (i!=j)
        {
            t = a[j][i] / a[i][i];
            for (k = 0; k < 4; k++)
                a[j][k] = a[j][k] - (a[i][k] * t);

```

```
    }  
    }  
}
```

```
printf("Final Matrix form : \n");  
for (i=0;i<3;i++)  
{  
    for (j=0;j<4;j++)  
    {  
        printf("\t %.2f", a[i][j]);  
    }  
    printf("\n");  
}
```

```
printf("\n\nValues are :\n");  
for (i = 0; i < 3; i++)  
{  
    printf("%f \n", a[i][3] / a[i][i]);  
}  
}
```

Output:

```
"F:\c_programming\CBNST LAB\gaussjordan.exe"
Enter the equation:
2x-y+3z=9
Enter the equation:
x+y+z=6
Enter the equation:
x-y+z=2
Equation 1: (2)x+(-1)y+(3)z=9
Equation 2: (1)x+(1)y+(1)z=6
Equation 3: (1)x+(-1)y+(1)z=2

Augmented Matrix:
2.00 -1.00 3.00 9.00
1.00 1.00 1.00 6.00
1.00 -1.00 1.00 2.00

Final Matrix form :
      2.00    0.00    0.00    2.00
      0.00    1.50    0.00    3.00
      0.00    0.00   -0.67   -2.00

Values are :
1.000000
2.000000
3.000000

Process returned 0 (0x0)   execution time : 19.375 s
Press any key to continue.
```