Gaussian Elimination

AIM:

To write a program to find the solution of a matrix using Gaussian Elimination.

Equipments Required:

1. Hardware – PCs
2. Anaconda – Python 3.7 Installation / Moodle-Code Runner

Algorithm

1. Start the program.
2. import numpy,import sys.
3. Use gaussian soliving methods.
4. Display the program.
5. Stop the program.

Program:

```
'''Program to solve a matrix using Gaussian elimination with partial pivoting.
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'''
/*
Program to find the solution of a matrix using Gaussian Elimination.
Developed by:
RegisterNumber:
import numpy as np
import sys
n=int(input())
a=np.zeros((n,n+1))
x=np.zeros(n)
for i in range(n):
    for j in range(n+1):
        a[i][j]=float(input())
for i in range(n):
    if a[i][i]==0:
        sys.exit('Divide by zero detected')
    for j in range(i+1,n):
        ratio=a[j][i]/a[i][i]
        for k in range(n+1):
            a[j][k]=a[j][k]-ratio*a[i][k]
#Back Substitution
```
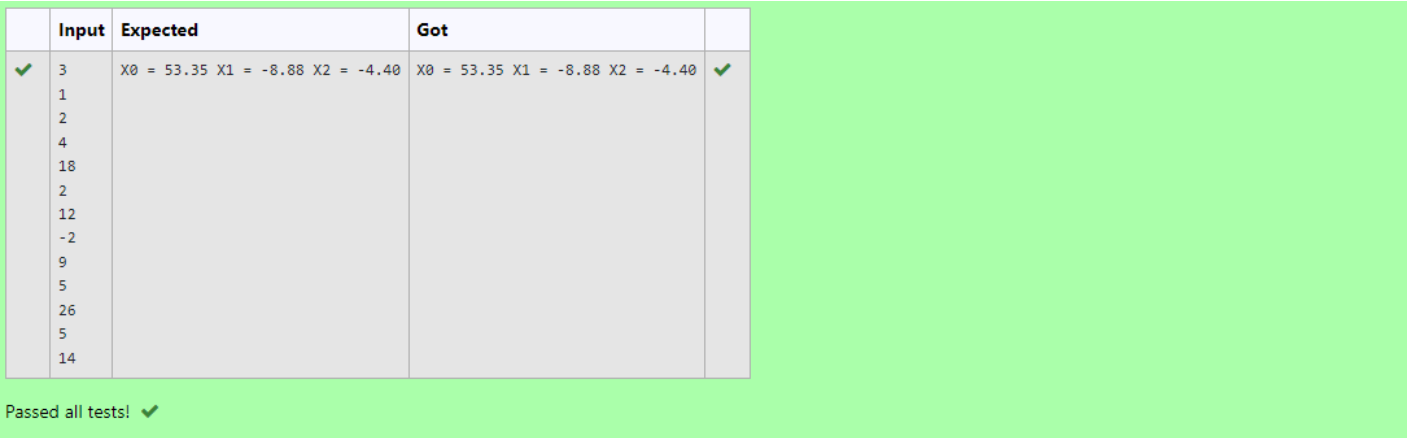

```
    x[n-1]=a[n-1][n]/a[n-1][n-1]
    for i in range(n-2,-1,-1):
        x[i]=a[i][n]
        for j in range(i+1,n):
            x[i]=x[i]-a[i][j]*x[j]
        x[i]=x[i]/a[i][i]
    #Displaying Solution
    for i in range(n):
        print('X%d = %0.2f' %(i,x[i]),end=' ')
    */
```

Output:



	Input	Expected	Got	
✔	3 1 2 4 18 2 12 -2 9 5 26 5 14	X0 = 53.35 X1 = -8.88 X2 = -4.40	X0 = 53.35 X1 = -8.88 X2 = -4.40	✔

Passed all tests! ✔

Result:

Thus the program to find the solution of a matrix using Gaussian Elimination is written and verified using python programming.