SOLUTION OF LINEAR EQUATIONS BY GAUSS JORDAN & GAUSS-ELIMINATION METHOD

SCILAB ALGORITHM

```
//gauss elimination method and gauss jordan method
clc; clear;
a=[12 3 -5; 1 5 3; 3 7 13]
b=[1;28;76]
n=length(b)
a=[a b]
for j=1:n-1     //Gauss elimination
for i=j+1:n     //Gauss elimination
//for j=1:n         //Gauss jordan
//  a(j,:)=a(j,:)/a(j,j)//Gauss jordan
//    for i=1:n       //Gauss jordan
      if i~=j
         m=a(i,j)/a(j,j)
         a(i,:)=a(i,:)-(m*a(j,:))
      end
   end
end
disp(a)
x=zeros(1,n)
for i=n:-1:1
   ax=sum(a(i,1:n).*x)
   x(i)=(a(i,n+1)-ax)/a(i,i)
   disp('x('+string(i)+')='+string(x(i)))
end
scf(0)
bar(x)
xtitle("Solution of Linear System (Gauss Elimination)","Variable Index","Value")
```

Python

```
#gauss elimination method and gauss jordan method
import numpy as np
import matplotlib.pyplot as plt
A=np.array([[12, 3, -5], [1, 5, 3], [3, 7, 13]],dtype=float)
b=np.array([[1],[28],[76]])
n=len(b)
a=np.hstack((A, b))
for j in range(n-1):          # Gauss Elimination
#for j in range(n):           # Gauss Jordan
    #a[j,:]=a[j,:]/a[j,j]    # Gauss Jordan
    #for i in range(n):      # Gauss Jordan
    for i in range (j+1,n): # Gauss Elimination
        if i!=j:
            m=a[i,j]/a[j,j]
            a[i,:]=a[i,:]-(m*a[j,:])
x=np.zeros(n)
for i in range(n-1,-1,-1):
    ax=np.sum(a[i,i+1:n]*x[i+1:n])
    x[i] = (a[i, -1] - ax) / a[i, i]
    print("\nSolution (Gauss Elimination):", x[i])
plt.figure(figsize=(5,4))
plt.bar(range(1, n+1), x)
plt.title("Solution of Linear System (Gauss Elimination)")
plt.xlabel("Variable Index")
plt.ylabel("Value")
plt.show()
```