# 4\_a.

## PROGRAM :

clc; clear all;

n=input('enter number of buses:'); l=input('number of lines:'); s=input('1:Impedance or 2:admittance'); ybus=zeros(n,n);

lc=zeros(n,n);

for i=1:I

a=input('starting bus:'); b=input('ending bus:');

t=input('admittance or impedance of lines') ; lca=input('line charging admittance:'); **if(S==1)**

y(a,b)=1/t;

else

y(a,b)=t; end y(b,a)=y(a,b); lc(a,b)=lca; lc(b,a)=lc(a,b);

end

for i=1:n for j=1:n

if i==i

for k=1:n

ybus(i,j)=ybus(i,j)+y(i ,k)+lc(i,k)/2; end

else

ybus(i,j)=-y(,ij); end ybusU,i)=ybus(i,j);

end

end ybus

ZBUS=inv(ybus)

## OUTPUT:

enter number of buses:3 number of lines:5

1:Impedance or 2:admittance1 starting bus:1

ending bus:2

admittance or impedance of lines0.02\*j line charging admittance:0

starting bus:1 ending bus:3

admittance or impedance of lines0.15 \*j line charging admittance:0

starting bus:1 ending bus:1

admittance or impedance of lines0.05\*j line charging admittance:0

starting bus:2 ending bus:3

admittance or impedance of lines0.04\*j

line charging admittance:0 starting bus:3

ending bus:3

admittance or impedance of lines0.02\*j line charging admittance:0

ybus =

0.0000 -76.6667i 0.0000 +50.0000i 0.0000 + 6.6667i

0.0000 +50.0000i 0.0000 -75.0000i 0.0000 +25.0000i

0.0000 + 6.6667i 0.0000+25.0000i 0.0000 -81.6667i

ZBUS=

0.0000 + 0.0278i 0.0000 + 0.021Si 0.0000 + 0.0089i

0.0000 + 0.021Si 0.0000 + 0.031Si 0.0000 + 0.0114i

0.0000+ 0.0089i 0.0000 + 0.0114i 0.0000 + 0.0165i

# 4\_b.

## PROGRAM:

clc; clear all;

L=input('enter the number of lines:'); N=O;

for p=1:L

C=menu('specify the case number', 'connect a new bus to reference bus','connect an old bus to new bus', 'connect an old bus to reference bus', 'connect two old buses');

switch C case{1}

m=input('enter new bus number:'); N=max(N,m);

Zi=input('enter impedance of the line:'); Zbus(m,:)=0;

Zbus(:,m)=O; Zbus(m,m)=Zi;disp(Zbus);

case{2}

m=input('enter new bus number'); N=max(N,m);

n=input('enter existing bus number:'); Zi=input('enter impedance of the line:'); Zbus(m,:)=Zbus(n,:);

Zbus(:,m)=Zbus(:,n); Zbus(m,m)=Zi+Zbus(n,n);disp(Zbus;)

case{3}

m=L+1;

n=input('enter existing bus number:'); Zi=input('enter impedance of the line:'); Zbus(m,:)=Zbus(n,:);;

Zbus(:,m)=Zbus(:,n);

Zbus(m,m)=Zi+Zbus(n,n); Zbusnew=zeros(N,N);

for X=1**:N** for y=1**:N**

Zbusnew(x,y)=Zbus(x,y)-Zbus(x,m)\*Zbus(m,y/)Zbus(m,m);

end end

Zbus=Zbusnew

case{4}

**m=L+1;**

n=input('enter first existing new number:'); o=input('enter second existing bus number;'); Zi=input('enterimpedance of the line:'); Zbus(m,:)=Zbus(n,:)-Zbus(o,:);

Zbus(:,m)=Zbus(,:n)-Zbus(:,o);

Zbus(m,m)=Zi+Zbus(n,n)+Zbus(o,o)-2\*Zbus(n,o); Zbusnew=zeros(N,N);

for x=1:N for y=1**:N**

Zbusnew(x,y)=Zbus (x,y)-Zbus(x,m)\*Zbus(m,y)/Zbus(m,m); end

end Zbus=Zbusnew

end end

## OUTPUT:

enter the number of lines:4 enter new bus number:1

enter impedance of the line:0.20\*j 0.0000 + 0.2000i

enter new bus number2 enter existing bus number:1

enter impedance of the line:0.50\*j 0.0000 + 0.2000i 0.0000 + 0.2000i

0.0000 + 0.2000i 0.0000 + 0.7000i

enter existing bus number:2

enter impedance of the line:0.30\*j Zbus=

0.0000 + 0.1600i 0.0000 + 0.0600i

0.0000 + 0.0600i 0.0000 + 0.2100i

enter new bus number3 enter existing bus number:1

enter impedance of the line:0.15\*j

|  |  |  |
| --- | --- | --- |
| 0.0000 + 0.1600i | 0.0000 + 0.0600i | 0.0000 + 0.1600i |
| 0.0000 + 0.0600i | 0.0000 + 0.2100i | 0.0000 + 0.0600i |
| 0.0000 + 0.1600i | 0.0000 + 0.0600i | 0.0000 + 0.3100i |