clc;

clear;

Ybus=[ 3-8.95j -2+6j -1+3j 0;-2+6j 3.774-11.306j -0.674+2.024j -1.044+3.134j; -1+3j -0.674+2.024j 3.666-10.96j -2+6j ;0 -1.044+3.134j -2+6j 3-8.99j ];

busdata=[1 1.05 0 0 0; 2 1 0 0.45 0.22; 3 1 0 -0.98 0.4;4 1 0 0.32 -0.15];

bus= busdata(:,1);

v=busdata(:,2);

delta= busdata(:,3);

p= busdata(:,4);

q=busdata(:,5);

nbus=max(bus);

vprev=v;

tolerance=1;

iter=0;

while tolerance>0.0001

for i=2:nbus

temp1=(p(i)-(q(i)\*1j))/conj(v(i));

temp2=0;

for k=1:nbus

if(i==k)

temp2=temp2+0;

else

temp2=temp2+Ybus(i,k)\*v(k);

end

end

v(i)=((temp1-temp2)/Ybus(i,i));

end

%slack bus power:

power=0;

for k=1:nbus

power=power+(Ybus(1,k)\*v(k))\*conj(v(1));

end

iter=iter+1;

tolerance=max(abs(abs(v)-abs(vprev)));

vprev=v;

angle=(180/pi)\*(atan(imag(v)./real(v)));

if iter==1

iter

v

angle

power

end

end

iter

v

angle

power