clear

%variables

nodes = 100;

bias = 2;

links = 500;

net = zeros(nodes,nodes);

for n=1:nodes

x = ceil(rand\*nodes); %x to random node

if x==n

x = ceil(rand\*nodes);

end

net(n,x) = 1;

net(x,n) = 1;

end

net = net.\*((eye(nodes,nodes)-1)\*-1);

for n = 1:ceil(nodes/10)

x = ceil(rand\*nodes);

y = ceil(rand\*nodes);

if x == y

y = ceil(rand\*nodes);

end

net(x,y)=1;

net(y,x)=1;

end

net = net.\*((eye(nodes,nodes)-1)\*-1);

while nnz(net)/2<links

PEdge = sum(net)/nodes;

PEdge = PEdge.^bias/sum(PEdge.^bias);

choice = rand;

criterion = 0;

for nn = 1:nodes

criterion = criterion+PEdge(nn);

if choice<criterion

choice=nn;

break

end

end

for nnn = 1:10000

i=choice;

j = ceil(rand\*nodes);

if net(i,j)==0

net(i,j)=1;

net(j,i)=1;

break

end

end

end

net = net.\*((eye(nodes,nodes)-1)\*-1);

net = (net+net')>0;

%histogram for connections

%triplet scale graphs

subplot(1,3,1)

hist(sum(net'),10);

[n,x]=hist(sum(net'),10);

subplot(1,3,2)

loglog(n,x,'\*k')

axis([1 100 1 100])

title('My scale-free network (Assignment #9)');

subplot(1,3,3)

N = length(net);

theta = linspace(0,2\*pi,N)';

xy = [cos(theta) sin(theta)];

gplot(net,xy)

A picture containing screenshot

Description automatically generated