```
%Erdos-Renyi Random Graph Network averaged over ten runs
clear %clears all variables

for run=1:10,  %ten runs of simulation
x=0;           %set counter to zero
cells=100;     %100 cells/nodes
m=zeros(cells,cells);  %matrix of connections
cellacts=zeros(1,cells);  %activations of nodes
                                    %used for testing size of network

for edges=cells/20:cells/20:cells*2.5;  %5 connections,
                                                    %then 10, then 15, etc.
   x=x+1;  %counter for how many times through loop
   m=zeros(cells,cells);  %reset m to zeros
   while sum(sum(m))<edges,  %keep adding connections until
                                        %until their sum = edges
      i=ceil(rand*(cells-1));  %pick row of matrix
      j=i+ceil(rand*(cells-i));
                              %j index must be higher than i index
       m(i,j)=1;  %a 1 in the matrix indicates a connection
   end

   bim=m+m';  %makes each connection bidirectional

   %Now, you must find size of largest network in graph
   for n=1:cells,  %do this for each cell/node
      cellacts=zeros(1,cells);  %set activations to zero
      cellacts(n)=1;  %inject activation into nth cell
      for t=1:cells,  %let activation spread 100 times
         cellacts=cellacts+cellacts*bim;
                                  %matrix algebra spreads activation
                                  %from every active cell
                                  %to every cell connected to them
                                  %and accumulates it in each cell
      end
      netsize(n)=nnz(cellacts);
           %count nonzero cells and save it in nth element
   end
   maxcomp(x)=max(netsize);  %save largest netsize value
   maxcompP(x)=max(netsize)/cells;  %make into proportion
                                                %in case cells is not 100
end
allmaxcomp(run,:)=maxcomp;   %save all ten runs
allmaxcompP(run,:)=maxcompP;  %save all ten runs
end
plot([.05:.05:2.5], mean(allmaxcomp))
```

```
%plot largest connected network component
%as a function of the ratio of connections to nodes
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