```matlab
% Number of nodes
N = 25; % Change this value as per your requirement

% Weights for each edge
weights = rand(N, 1) * 10;

% Adjacency matrix
adjMatrix = zeros(N);
for i=1:N-1
    adjMatrix(i, i+1) = weights(i);
    adjMatrix(i+1, i) = weights(i);
end
adjMatrix(N, 1) = weights(N);
adjMatrix(1, N) = weights(N);

G = graph(adjMatrix);

% Visualize the network
nodeColor = 'red';
figure;
plot(G, 'NodeColor', nodeColor);

% Calculate Degree Centrality
degreeCentrality = centrality(G, 'degree');
disp('Degree Centrality:');
disp(degreeCentrality);

%Calculate ShortestPath
shortestPaths = distances(G);
disp('Shortest Paths:');
disp(shortestPaths);

%Calculate Betweenness Centrality
betweennessCentrality = centrality(G, 'betweenness');
disp('Betweenness Centrality:');
disp(betweennessCentrality);

%Calculate Network Diameter
diameter = max(max(shortestPaths));
disp('Network Diameter:');
disp(diameter);

%Calculate Closeness Centrality
closenessCentrality = centrality(G, 'closeness');
disp('Closeness Centrality:');
disp(closenessCentrality);

%Example
group = [1 2 1 2 1 1 2 1 2 1 1 2 1 2 1 1 2 1 2 1 1 2 1 2 1];


%Calcualte Network Modularity
[Q,Qv] = modularity(adjMatrix,group);
disp('Modularity:');
disp(Q);

%Calculate Network Resilience
resilience = zeros(N, 1);
for i = 1:N
```

```
    tempAdjMatrix = adjMatrix;
    tempAdjMatrix(i, :) = 0;  % Remove node i and its connections
    tempAdjMatrix(:, i) = 0;
    [bins, ~] = conncomp(graph(tempAdjMatrix));
    resilience(i) = max(bins);  % Measure
end

disp('Resilience Index:');
disp(resilience);
```

Degree Centrality:
```
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
     2
```

Shortest Paths:
  Columns 1 through 7

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 5.4281 | 10.8292 | 13.9403 | 14.6526 | 16.4724 | 17.4023 |
| 5.4281 | 0 | 5.4011 | 8.5122 | 9.2245 | 11.0443 | 11.9742 |
| 10.8292 | 5.4011 | 0 | 3.1111 | 3.8234 | 5.6432 | 6.5731 |
| 13.9403 | 8.5122 | 3.1111 | 0 | 0.7123 | 2.5322 | 3.4620 |
| 14.6526 | 9.2245 | 3.8234 | 0.7123 | 0 | 1.8198 | 2.7497 |
| 16.4724 | 11.0443 | 5.6432 | 2.5322 | 1.8198 | 0 | 0.9299 |
| 17.4023 | 11.9742 | 6.5731 | 3.4620 | 2.7497 | 0.9299 | 0 |
| 22.0372 | 16.6091 | 11.2080 | 8.0969 | 7.3846 | 5.5648 | 4.6349 |
| 22.1305 | 16.7024 | 11.3014 | 8.1903 | 7.4779 | 5.6581 | 4.7282 |
| 31.2808 | 25.8527 | 20.4516 | 17.3405 | 16.6282 | 14.8084 | 13.8785 |
| 37.7082 | 32.2801 | 26.8790 | 23.7679 | 23.0556 | 21.2358 | 20.3059 |
| 37.7224 | 32.2943 | 26.8932 | 23.7821 | 23.0698 | 21.2500 | 20.3201 |
| 38.0263 | 32.5981 | 27.1971 | 24.0860 | 23.3736 | 21.5538 | 20.6239 |
| 40.1110 | 34.6828 | 29.2818 | 26.1707 | 25.4583 | 23.6385 | 22.7086 |
| 36.5475 | 39.2325 | 33.8314 | 30.7203 | 30.0080 | 28.1882 | 27.2583 |
| 35.2748 | 40.5052 | 35.1041 | 31.9930 | 31.2807 | 29.4609 | 28.5310 |
| 35.1884 | 40.5916 | 35.1906 | 32.0795 | 31.3671 | 29.5473 | 28.6174 |
| 27.9176 | 33.3457 | 38.7468 | 39.3503 | 38.6379 | 36.8181 | 35.8882 |
| 24.3764 | 29.8045 | 35.2056 | 38.3167 | 39.0290 | 40.3593 | 39.4294 |
```

```
16.5719    22.0001    27.4011    30.5122    31.2246    33.0444    33.9743
12.2054    17.6335    23.0346    26.1457    26.8580    28.6778    29.6077
 7.8398    13.2680    18.6690    21.7801    22.4925    24.3123    25.2421
 7.3477    12.7758    18.1769    21.2880    22.0003    23.8201    24.7500
 6.8514    12.2795    17.6806    20.7917    21.5040    23.3238    24.2537
 5.9404    11.3685    16.7696    19.8807    20.5930    22.4128    23.3427


Columns 8 through 14

22.0372    22.1305    31.2808    37.7082    37.7224    38.0263    40.1110
16.6091    16.7024    25.8527    32.2801    32.2943    32.5981    34.6828
11.2080    11.3014    20.4516    26.8790    26.8932    27.1971    29.2818
 8.0969     8.1903    17.3405    23.7679    23.7821    24.0860    26.1707
 7.3846     7.4779    16.6282    23.0556    23.0698    23.3736    25.4583
 5.5648     5.6581    14.8084    21.2358    21.2500    21.5538    23.6385
 4.6349     4.7282    13.8785    20.3059    20.3201    20.6239    22.7086
      0     0.0933     9.2436    15.6710    15.6852    15.9890    18.0737
 0.0933          0     9.1503    15.5777    15.5919    15.8957    17.9804
 9.2436     9.1503          0     6.4274     6.4416     6.7455     8.8302
15.6710    15.5777     6.4274          0     0.0142     0.3180     2.4027
15.6852    15.5919     6.4416     0.0142          0     0.3039     2.3886
15.9890    15.8957     6.7455     0.3180     0.3039          0     2.0847
18.0737    17.9804     8.8302     2.4027     2.3886     2.0847          0
22.6234    22.5301    13.3798     6.9524     6.9382     6.6344     4.5497
23.8961    23.8027    14.6525     8.2251     8.2109     7.9070     5.8223
23.9825    23.8892    14.7390     8.3115     8.2974     7.9935     5.9088
31.2533    31.1600    22.0098    15.5823    15.5681    15.2643    13.1796
34.7945    34.7012    25.5509    19.1235    19.1093    18.8055    16.7208
38.6092    38.7025    33.3554    26.9280    26.9138    26.6099    24.5252
34.2426    34.3359    37.7219    31.2945    31.2803    30.9765    28.8918
29.8770    29.9704    39.1206    35.6601    35.6459    35.3420    33.2573
29.3849    29.4782    38.6285    36.1522    36.1380    35.8342    33.7495
28.8886    28.9819    38.1322    36.6485    36.6343    36.3305    34.2458
27.9776    28.0709    37.2212    37.5595    37.5453    37.2415    35.1568


Columns 15 through 21

36.5475    35.2748    35.1884    27.9176    24.3764    16.5719    12.2054
39.2325    40.5052    40.5916    33.3457    29.8045    22.0001    17.6335
33.8314    35.1041    35.1906    38.7468    35.2056    27.4011    23.0346
30.7203    31.9930    32.0795    39.3503    38.3167    30.5122    26.1457
30.0080    31.2807    31.3671    38.6379    39.0290    31.2246    26.8580
28.1882    29.4609    29.5473    36.8181    40.3593    33.0444    28.6778
27.2583    28.5310    28.6174    35.8882    39.4294    33.9743    29.6077
22.6234    23.8961    23.9825    31.2533    34.7945    38.6092    34.2426
22.5301    23.8027    23.8892    31.1600    34.7012    38.7025    34.3359
13.3798    14.6525    14.7390    22.0098    25.5509    33.3554    37.7219
 6.9524     8.2251     8.3115    15.5823    19.1235    26.9280    31.2945
 6.9382     8.2109     8.2974    15.5681    19.1093    26.9138    31.2803
 6.6344     7.9070     7.9935    15.2643    18.8055    26.6099    30.9765
 4.5497     5.8223     5.9088    13.1796    16.7208    24.5252    28.8918
      0     1.2727     1.3591     8.6299    12.1711    19.9756    24.3421
 1.2727          0     0.0865     7.3573    10.8984    18.7029    23.0695
 1.3591     0.0865          0     7.2708    10.8120    18.6164    22.9830
 8.6299     7.3573     7.2708          0     3.5412    11.3456    15.7122
12.1711    10.8984    10.8120     3.5412          0     7.8045    12.1710
19.9756    18.7029    18.6164    11.3456     7.8045          0     4.3666
24.3421    23.0695    22.9830    15.7122    12.1710     4.3666          0
28.7077    27.4350    27.3485    20.0777    16.5366     8.7321     4.3655
29.1998    27.9271    27.8407    20.5699    17.0287     9.2242     4.8577
29.6961    28.4235    28.3370    21.0662    17.5250     9.7206     5.3540
```

```
   30.6071    29.3345    29.2480    21.9772    18.4360    10.6316     6.2650
```

Columns 22 through 25

```
    7.8398     7.3477     6.8514     5.9404
   13.2680    12.7758    12.2795    11.3685
   18.6690    18.1769    17.6806    16.7696
   21.7801    21.2880    20.7917    19.8807
   22.4925    22.0003    21.5040    20.5930
   24.3123    23.8201    23.3238    22.4128
   25.2421    24.7500    24.2537    23.3427
   29.8770    29.3849    28.8886    27.9776
   29.9704    29.4782    28.9819    28.0709
   39.1206    38.6285    38.1322    37.2212
   35.6601    36.1522    36.6485    37.5595
   35.6459    36.1380    36.6343    37.5453
   35.3420    35.8342    36.3305    37.2415
   33.2573    33.7495    34.2458    35.1568
   28.7077    29.1998    29.6961    30.6071
   27.4350    27.9271    28.4235    29.3345
   27.3485    27.8407    28.3370    29.2480
   20.0777    20.5699    21.0662    21.9772
   16.5366    17.0287    17.5250    18.4360
    8.7321     9.2242     9.7206    10.6316
    4.3655     4.8577     5.3540     6.2650
         0     0.4921     0.9885     1.8995
    0.4921          0     0.4963     1.4073
    0.9885     0.4963          0     0.9110
    1.8995     1.4073     0.9110          0
```

Betweenness Centrality:
```
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
    66
```

Network Diameter:
```
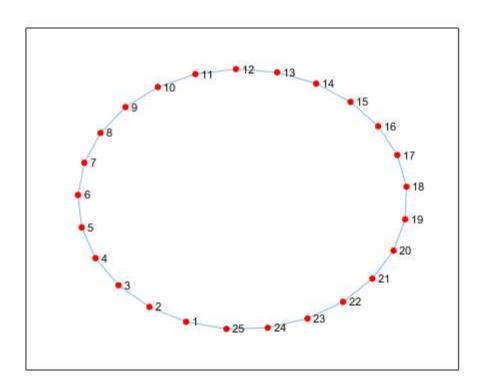   40.5916
```

Closeness Centrality:

```
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
    0.0064
```

Modularity:
   -0.2857

Resilience Index:
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2
       2