```matlab
% Grid size
gridSize = 5; % Change this value as per your requirement

% Number of nodes
N = gridSize^2;

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

% Adjacency matrix
adjMatrix = zeros(N);

for i = 1:gridSize
    for j = 1:gridSize
        node = (i - 1) * gridSize + j;
        if i > 1
            adjMatrix(node, node - gridSize) = weights(node);
            adjMatrix(node - gridSize, node) = weights(node);
        end
        if i < gridSize
            adjMatrix(node, node + gridSize) = weights(node);
            adjMatrix(node + gridSize, node) = weights(node);
        end
        if j > 1
            adjMatrix(node, node - 1) = weights(node);
            adjMatrix(node - 1, node) = weights(node);
        end
        if j < gridSize
            adjMatrix(node, node + 1) = weights(node);
            adjMatrix(node + 1, node) = weights(node);
        end
    end
end

G = graph(adjMatrix);

% Visualization
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:');
```

```matlab
disp(diameter);

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

%Example groups
group = ones(1, N);

%Calculate 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 connectivity
end

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

Degree Centrality:
     2
     3
     3
     3
     2
     3
     4
     4
     4
     3
     3
     4
     4
     4
     3
     3
     4
     4
     4
     3
     2
     3
     3
     3
     2

Shortest Paths:
  Columns 1 through 7

         0   4.0872   8.6530   11.2751   16.8212   7.1122   6.3047

```
  4.0872        0    4.5658    7.1879   12.7340    4.4349    2.2175
  8.6530    4.5658        0    2.6221    8.6505    4.5658    2.3484
 11.2751    7.1879    2.6221        0    6.0284    7.1879    4.9705
 16.8212   12.7340    8.6505    6.0284        0   12.7340   10.5165
  7.1122    4.4349    4.5658    7.1879   12.7340        0    2.2175
  6.3047    2.2175    2.3484    4.9705   10.5165    2.2175        0
  7.4788    3.3916    1.1742    3.7963    9.3423    3.3916    1.1742
 10.4456    6.3584    4.1409    2.9668    6.3756    6.3584    4.1409
 13.6334    9.5462    7.3287    6.1545    3.1878    9.5462    7.3287
 11.3538    8.6766    7.9631   10.5852   16.1312    4.2417    6.4591
  9.1892    5.1020    2.8845    5.5066   11.0526    5.1020    2.8845
  8.3340    4.2468    2.0293    4.6515   10.1975    4.2468    2.0293
 10.9588    6.8716    4.6542    5.5916    9.0004    6.8716    4.6542
 18.9690   14.8818   12.6643   13.6017   11.1979   14.8818   12.6643
 11.6460    8.9688    8.2553   10.8774   16.4234    4.5339    6.7513
 18.4777   14.3905   12.1730   14.7952   20.3412   13.8224   12.1730
 15.6373   11.5501    9.3326   11.9548   17.5008   11.5501    9.3326
 15.8449   11.7577    9.5402   10.4777   13.8865   11.7577    9.5402
 21.6302   17.5430   15.3255   16.2629   16.9832   17.5430   15.3255
 14.0189   11.3416   10.6281   13.2502   18.7963    6.9067    9.1242
 18.6074   15.9301   15.2166   17.8387   23.3848   11.4952   13.7127
 25.2682   21.1810   18.9635   21.4138   24.8226   21.1261   18.9635
 21.3130   17.2258   15.0083   15.9457   19.3545   17.2258   15.0083
 26.5243   22.4371   20.2197   21.1571   22.1945   22.4371   20.2197


Columns 8 through 14

  7.4788   10.4456   13.6334   11.3538    9.1892    8.3340   10.9588
  3.3916    6.3584    9.5462    8.6766    5.1020    4.2468    6.8716
  1.1742    4.1409    7.3287    7.9631    2.8845    2.0293    4.6542
  3.7963    2.9668    6.1545   10.5852    5.5066    4.6515    5.5916
  9.3423    6.3756    3.1878   16.1312   11.0526   10.1975    9.0004
  3.3916    6.3584    9.5462    4.2417    5.1020    4.2468    6.8716
  1.1742    4.1409    7.3287    6.4591    2.8845    2.0293    4.6542
       0    2.9668    6.1545    6.7889    1.7103    0.8552    3.4800
  2.9668        0    3.1878    9.7557    4.6771    3.8219    2.6248
  6.1545    3.1878        0   12.9434    7.8649    7.0097    5.8126
  6.7889    9.7557   12.9434        0    5.0786    5.9337    8.5586
  1.7103    4.6771    7.8649    5.0786        0    0.8552    3.4800
  0.8552    3.8219    7.0097    5.9337    0.8552        0    2.6248
  3.4800    2.6248    5.8126    8.5586    3.4800    2.6248        0
 11.4901   10.6350    8.0101   16.5687   11.4901   10.6350    8.0101
  7.0811   10.0479   13.2356    0.2922    5.3708    6.2259    8.8508
 10.9989   13.9656   17.1534    9.5807    9.2885   10.1437   12.7685
  8.1585   11.1252   14.3130   13.2370    8.1585    7.3033    9.7722
  8.3661    7.5109   10.6987   13.4447    8.3661    7.5109    4.8861
 14.1513   13.2962   13.7954   19.2299   14.1513   13.2962   10.6713
  9.4539   12.4207   15.6085    2.6650    7.7436    8.5988   11.2236
 14.0424   17.0092   20.1970    7.2535   12.3321   13.1873   15.8121
 17.7894   18.4470   21.6348   16.8844   17.7894   16.9342   15.8222
 13.8341   12.9790   16.1668   18.9127   13.8341   12.9790   10.3541
 19.0455   18.1903   19.0068   24.1241   19.0455   18.1903   15.5655


Columns 15 through 21

 18.9690   11.6460   18.4777   15.6373   15.8449   21.6302   14.0189
 14.8818    8.9688   14.3905   11.5501   11.7577   17.5430   11.3416
 12.6643    8.2553   12.1730    9.3326    9.5402   15.3255   10.6281
 13.6017   10.8774   14.7952   11.9548   10.4777   16.2629   13.2502
 11.1979   16.4234   20.3412   17.5008   13.8865   16.9832   18.7963
 14.8818    4.5339   13.8224   11.5501   11.7577   17.5430    6.9067
```

```
  12.6643    6.7513   12.1730    9.3326    9.5402   15.3255    9.1242
  11.4901    7.0811   10.9989    8.1585    8.3661   14.1513    9.4539
  10.6350   10.0479   13.9656   11.1252    7.5109   13.2962   12.4207
   8.0101   13.2356   17.1534   14.3130   10.6987   13.7954   15.6085
  16.5687    0.2922    9.5807   13.2370   13.4447   19.2299    2.6650
  11.4901    5.3708    9.2885    8.1585    8.3661   14.1513    7.7436
  10.6350    6.2259   10.1437    7.3033    7.5109   13.2962    8.5988
   8.0101    8.8508   12.7685    9.7722    4.8861   10.6713   11.2236
        0   16.8609   20.7787   16.4566   11.5705    5.7853   19.2337
  16.8609         0    9.2885   13.5293   13.7369   19.5221    2.3728
  20.7787    9.2885         0    7.3033   12.1894   17.9746    9.1770
  16.4566   13.5293    7.3033         0    4.8861   10.6713   15.9021
  11.5705   13.7369   12.1894    4.8861         0    5.7853   16.1097
   5.7853   19.5221   17.9746   10.6713    5.7853         0   21.8949
  19.2337    2.3728    9.1770   15.9021   16.1097   21.8949         0
  23.8222    6.9613    4.5885   11.8918   16.7779   22.5631    4.5885
  21.6760   16.5922   14.2194    9.6309   10.9361   15.8908   14.2194
  16.2080   19.2049   17.6575   10.3541    5.4681   10.4227   19.6874
  10.9966   24.4163   22.8688   15.5655   10.6794    5.2114   24.8988
```

Columns 22 through 25

```
  18.6074   25.2682   21.3130   26.5243
  15.9301   21.1810   17.2258   22.4371
  15.2166   18.9635   15.0083   20.2197
  17.8387   21.4138   15.9457   21.1571
  23.3848   24.8226   19.3545   22.1945
  11.4952   21.1261   17.2258   22.4371
  13.7127   18.9635   15.0083   20.2197
  14.0424   17.7894   13.8341   19.0455
  17.0092   18.4470   12.9790   18.1903
  20.1970   21.6348   16.1668   19.0068
   7.2535   16.8844   18.9127   24.1241
  12.3321   17.7894   13.8341   19.0455
  13.1873   16.9342   12.9790   18.1903
  15.8121   15.8222   10.3541   15.5655
  23.8222   21.6760   16.2080   10.9966
   6.9613   16.5922   19.2049   24.4163
   4.5885   14.2194   17.6575   22.8688
  11.8918    9.6309   10.3541   15.5655
  16.7779   10.9361    5.4681   10.6794
  22.5631   15.8908   10.4227    5.2114
   4.5885   14.2194   19.6874   24.8988
        0    9.6309   15.0989   20.3103
   9.6309         0    5.4681   10.6794
  15.0989    5.4681         0    5.2114
  20.3103   10.6794    5.2114         0
```

Betweenness Centrality:
```
    2.6881
   17.2071
   21.5429
   17.2071
    2.6881
   17.2071
   45.3333
   54.5857
   45.3333
   17.2071
   21.5429
   54.5857
```

```
    65.7429
    54.5857
    21.5429
    17.2071
    45.3333
    54.5857
    45.3333
    17.2071
     2.6881
    17.2071
    21.5429
    17.2071
     2.6881


Network Diameter:
    26.5243


Closeness Centrality:
     0.0100
     0.0118
     0.0125
     0.0118
     0.0100
     0.0118
     0.0143
     0.0154
     0.0143
     0.0118
     0.0125
     0.0154
     0.0167
     0.0154
     0.0125
     0.0118
     0.0143
     0.0154
     0.0143
     0.0118
     0.0100
     0.0118
     0.0125
     0.0118
     0.0100


Modularity:
    1.1102e-16


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