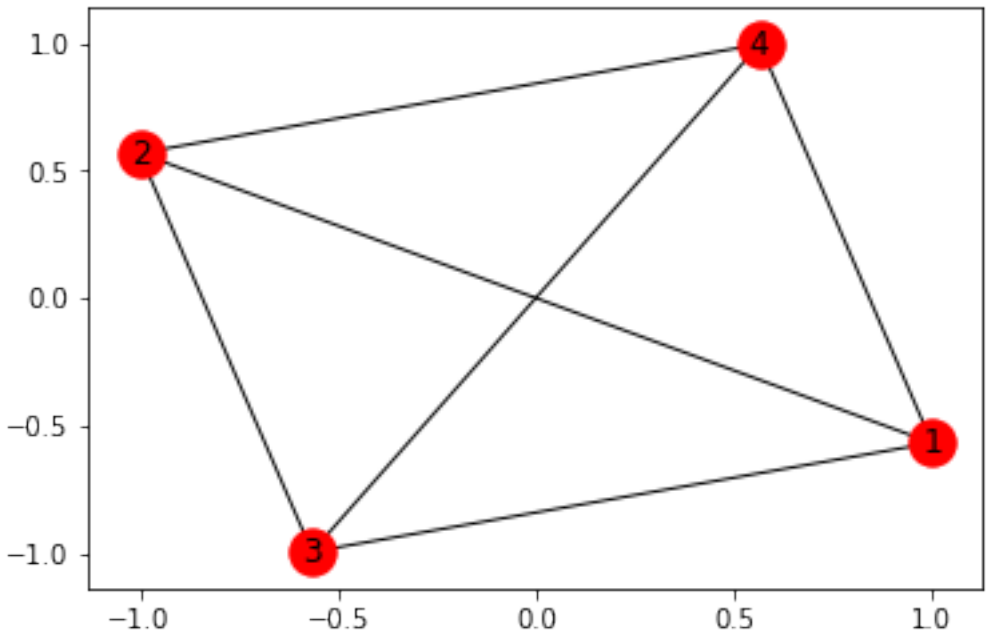
graphs

April 7, 2019

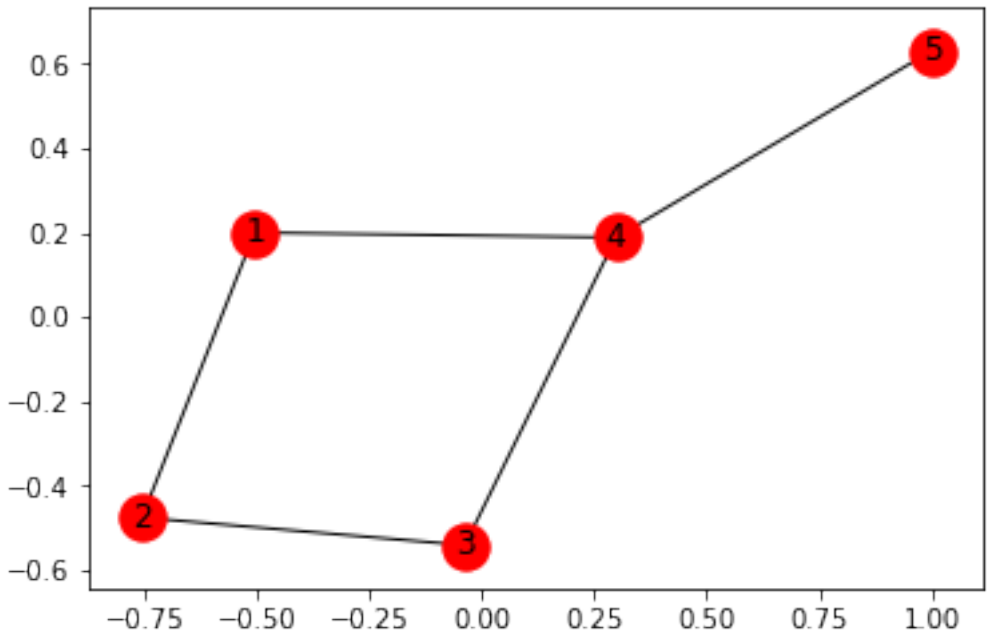
In [2]:
```
%matplotlib inline
import matplotlib.pyplot as plt
import networkx as nx
```

In [2]:
```
G = nx.Graph()
G.add_edge(1,2)
G.add_edge(2,3)
G.add_edge(3,1)
G.add_edge(3,4)
G.add_edge(4,1)
G.add_edge(4,2)
nx.draw_networkx(G)
plt.show()
```

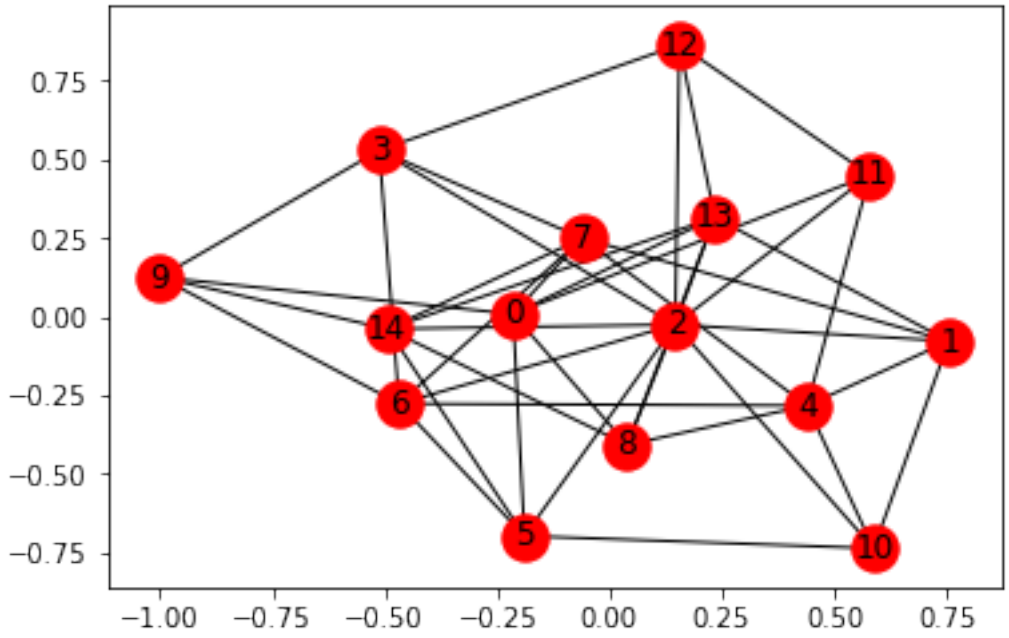
```
d:\python\lib\site-packages\networkx\drawing\nx_pylab.py:611: MatplotlibDeprecationWarning: isi
  if cb.is_numlike(alpha):
```



In [3]:
```
G = nx.Graph()
G.add_edges_from([(1,2), (2,3),(3,4), (4,1), (5,4)])
nx.draw_networkx(G)
plt.show()
```

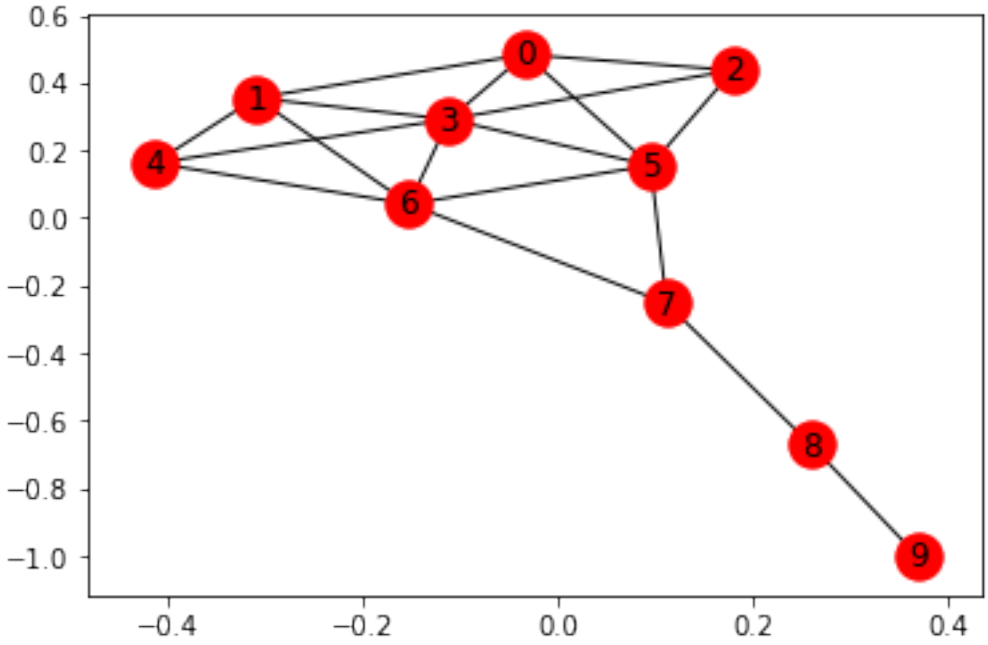


In [6]:
```
k = nx.fast_gnp_random_graph(15,0.40)
nx.draw_networkx(k)
plt.show()
```



In [8]:
```
G = nx.krackhardt_kite_graph()
nx.draw_networkx(G)
plt.show()
```

```
d:\python\lib\site-packages\networkx\drawing\nx_pylab.py:611: MatplotlibDeprecationWarning: is
  if cb.is_numlike(alpha):
```



```
In [10]: print(nx.has_path(G, source=1, target=9))
         print(nx.shortest_path(G, source=1, target=9))
         print(nx.shortest_path_length(G, source=1, target=9))
```

```
True
[1, 6, 7, 8, 9]
4
```

```
In [14]: all_paths = list(nx.shortest_simple_paths(G, source=1, target=9))
         for path in all_paths:
             print(path)
```

```
[1, 6, 7, 8, 9]
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[1, 6, 5, 7, 8, 9]
[1, 3, 5, 7, 8, 9]
[1, 4, 6, 7, 8, 9]
[1, 3, 6, 7, 8, 9]
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[1, 0, 5, 6, 7, 8, 9]
[1, 6, 3, 5, 7, 8, 9]
[1, 3, 5, 6, 7, 8, 9]
[1, 4, 3, 5, 7, 8, 9]
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[1, 3, 2, 5, 6, 7, 8, 9]
```

```
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[1, 4, 6, 3, 2, 0, 5, 7, 8, 9]
```

```
In [11]: paths = nx.all_pairs_shortest_path(G)
         for path in paths:
             print(path)
```

```
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```

```
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```
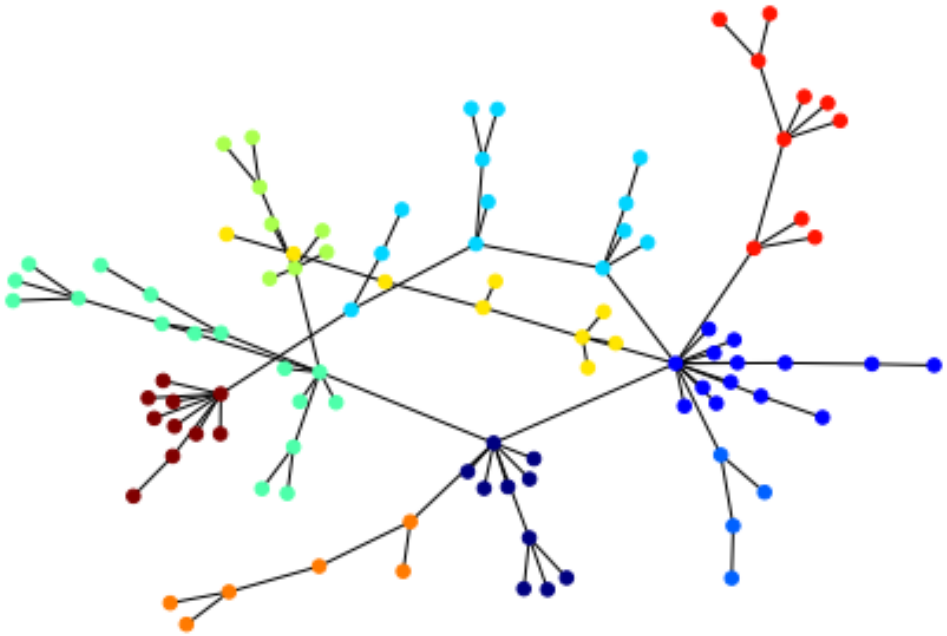

In [14]:
```
import community.community_louvain as community
#print(dir(community))
G = nx.powerlaw_cluster_graph(100, 1, .4, seed=101)
partition = community.best_partition(G)
for i in set(partition.values()):
    print("Society ",i)
    members = list_nodes = [nodes for nodes in partition.keys() if partition[nodes] ==
    print(members)
values = [partition.get(node) for node in G.nodes()]
nx.draw_spring(G, cmap=plt.get_cmap('jet'), node_color=values, node_size=30, with_labe
plt.show()
print("Level of modularity: ", community.modularity(partition, G))
```

```
Society  0
[1, 2, 9, 16, 20, 28, 29, 35, 57, 65, 78, 83, 89, 93]
Society  1
[1, 2, 9, 16, 20, 28, 29, 35, 57, 65, 78, 83, 89, 93]
Society  2
[1, 2, 9, 16, 20, 28, 29, 35, 57, 65, 78, 83, 89, 93]
Society  3
[1, 2, 9, 16, 20, 28, 29, 35, 57, 65, 78, 83, 89, 93]
Society  4
[1, 2, 9, 16, 20, 28, 29, 35, 57, 65, 78, 83, 89, 93]
Society  5
[1, 2, 9, 16, 20, 28, 29, 35, 57, 65, 78, 83, 89, 93]
Society  6
[1, 2, 9, 16, 20, 28, 29, 35, 57, 65, 78, 83, 89, 93]
Society  7
[1, 2, 9, 16, 20, 28, 29, 35, 57, 65, 78, 83, 89, 93]
Society  8
[1, 2, 9, 16, 20, 28, 29, 35, 57, 65, 78, 83, 89, 93]
Society  9
[1, 2, 9, 16, 20, 28, 29, 35, 57, 65, 78, 83, 89, 93]


d:\python\lib\site-packages\networkx\drawing\nx_pylab.py:611: MatplotlibDeprecationWarning: isi
  if cb.is_numlike(alpha):
```



```
Level of modularity:  0.7941026425874911
```

In [ ]: