

Social analysis have important implications for understanding:

- Epidemics
- Planning effective interventions
- In biological context, it can be applied to:
 - Gene regulation networks
 - Signal transduction network
 - Protein interaction network

In [1]:

```
import networkx as nx
```

In [2]:

```
G= nx.Graph()
```

In [3]:

```
G.add_node(1) # add node number 1
```

In [4]:

```
# can also add multiple nodes
G.add_nodes_from(['u', 'v', 2, 3])
```

In [5]:

```
G.nodes()
```

Out[5]:

```
NodeView((1, 'u', 'v', 2, 3))
```

In [6]:

```
#add edges. Edges are pairs of nodes. So G.add_edge(1,2) adds edge between nodes #1,2 in this case 1 and "v"
G.add_edge(1,2)
```

In [8]:

```
G.add_edge('u', 'v')
```

In [10]:

```
#add multiple edges. use add_edges_from([list of tuples]), we can add edges to nodes that don't exist yet. python will create these nodes automatically
G.add_edges_from([(1,3), (1,4), (1,6), (1,5)])
```

In [11]:

```
G.add_edge('u', 'w')
```

In [12]:

```
G.edges()
```

Out[12]:

```
EdgeView([(1, 2), (1, 3), (1, 4), (1, 6), (1, 5), ('u', 'v'), ('u', 'w')])
```

In [13]:

```
G.remove_node(2) #G.remove_edge(), G.remove_edge_from([(),(),...])
```

In [14]:

```
G.nodes()
```

Out[14]:

```
NodeView((1, 'u', 'v', 3, 4, 6, 5, 'w'))
```

In [17]:

```
G.number_of_nodes()
```

Out[17]:

8

In [18]:

```
G.number_of_edges()
```

Out[18]:

6

In [19]:

```
#Karate club example
```

In [20]:

```
G= nx.karate_club_graph()
```

In [21]:

```
import matplotlib.pyplot as plt
```

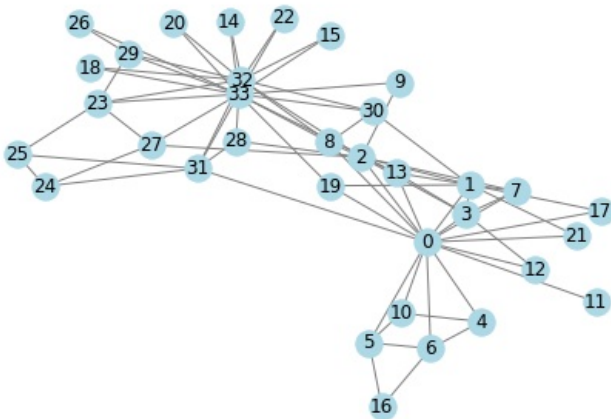
In [22]:

```
nx.draw(G, with_labels=True, node_color='lightblue', edge_color='gray')
```

C:\Users\maria\Anaconda3\lib\site-packages\networkx\drawing\nx_pylab.py:579: MatplotlibDeprecationWarning:

The iterable function was deprecated in Matplotlib 3.1 and will be removed in 3.3. Use np.iterable instead.

```
if not cb.iterable(width):
```



In [23]:

```
G.degree() # value is degree of nodes or number of edges each node has
```

Out[23]:

```
DegreeView({0: 16, 1: 9, 2: 10, 3: 6, 4: 3, 5: 4, 6: 4, 7: 4, 8: 5, 9: 2, 10: 3, 11: 1, 12: 2, 13: 5, 14: 2, 15: 2, 16: 2, 17: 2, 18: 2, 19: 3, 20: 2, 21: 2, 22: 2, 23: 5, 24: 3, 25: 3, 26: 2, 27: 4, 28: 3, 29: 4, 30: 4, 31: 6, 32: 12, 33: 17})
```

In [24]:

```
G.degree()[32]
```

Out[24]:

12

In [25]:

```
G.degree(33)
```

Out[25]:

17

In [26]:

```
pwd
```

Out[26]:

```
'C:\\Users\\maria\\Documents\\python for github'
```

In []: