Visualizing Graphs with NetworkX

October 8, 2020

1 Visualizing Networks

```python
In [ ]: %matplotlib notebook

        import networkx as nx
        import matplotlib.pyplot as plt

        # read in the graph
        G = nx.read_gpickle('major_us_cities')
```

```python
In [ ]: # draw the graph using the default spring layout
        plt.figure(figsize=(10,9))
        nx.draw_networkx(G)
```

```python
In [ ]: # See what layouts are available in networkX
        [x for x in nx.__dir__() if x.endswith('_layout')]
```

```python
In [ ]: # Draw the graph using the random layout
        plt.figure(figsize=(10,9))
        pos = nx.random_layout(G)
        nx.draw_networkx(G, pos)
```

```python
In [ ]: # Draw the graph using the circular layout
        plt.figure(figsize=(10,9))
        pos = nx.circular_layout(G)
        nx.draw_networkx(G, pos)
```

```python
In [ ]: # Draw the graph using custom node positions
        plt.figure(figsize=(10,7))

        pos = nx.get_node_attributes(G, 'location')
        nx.draw_networkx(G, pos)
```

```python
In [ ]: # Draw the graph adding alpha, removing labels, and softening edge color
        plt.figure(figsize=(10,7))

        nx.draw_networkx(G, pos, alpha=0.7, with_labels=False, edge_color='.4')

        plt.axis('off')
        plt.tight_layout();
```

```
In [ ]: # Draw graph with varying node color, node size, and edge width
        plt.figure(figsize=(10,7))

        node_color = [G.degree(v) for v in G]
        node_size = [0.0005*nx.get_node_attributes(G, 'population')[v] for v in G]
        edge_width = [0.0015*G[u][v]['weight'] for u,v in G.edges()]

        nx.draw_networkx(G, pos, node_size=node_size,
                         node_color=node_color, alpha=0.7, with_labels=False,
                         width=edge_width, edge_color='.4', cmap=plt.cm.Blues)

        plt.axis('off')
        plt.tight_layout();

In [ ]: # Draw specific edges and add labels to specific nodes
        plt.figure(figsize=(10,7))

        node_color = [G.degree(v) for v in G]
        node_size = [0.0005*nx.get_node_attributes(G, 'population')[v] for v in G]
        edge_width = [0.0015*G[u][v]['weight'] for u,v in G.edges()]

        nx.draw_networkx(G, pos, node_size=node_size,
                         node_color=node_color, alpha=0.7, with_labels=False,
                         width=edge_width, edge_color='.4', cmap=plt.cm.Blues)


        greater_than_770 = [x for x in G.edges(data=True) if x[2]['weight']>770]
        nx.draw_networkx_edges(G, pos, edgelist=greater_than_770, edge_color='r', alpha=0.4, wid

        nx.draw_networkx_labels(G, pos, labels={'Los Angeles, CA': 'LA', 'New York, NY': 'NYC'},

        plt.axis('off')
        plt.tight_layout();
```