# shortest path-hw

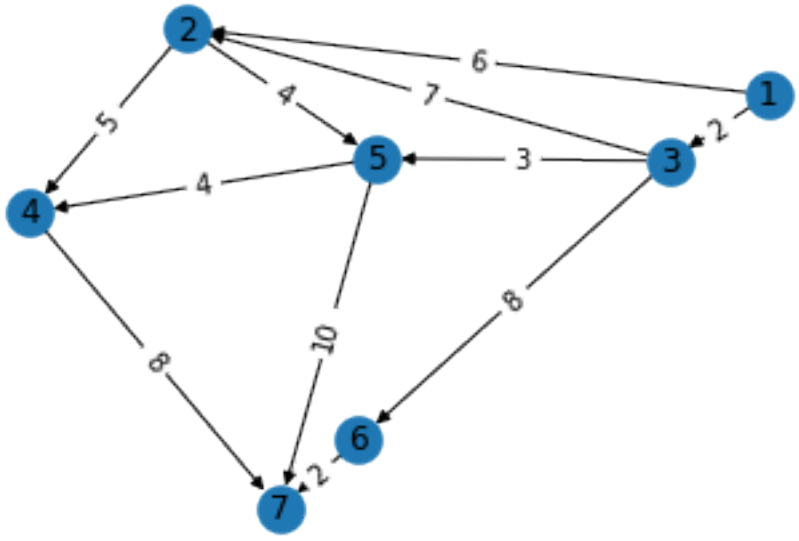
April 16, 2021

## 1 Shortest Path Problem - Homework

Consider the following network.

[5]:
```
import matplotlib.pyplot as plt
import networkx as nx
G = nx.DiGraph()

G.add_node(1)
G.add_node(2)
G.add_node(3)
G.add_node(4)
G.add_node(5)
G.add_node(6)
G.add_node(7)
G.add_edge(1, 2, weight = 6)
G.add_edge(1, 3, weight = 2)
G.add_edge(2,4, weight = 5)
G.add_edge(2,5, weight = 4)
G.add_edge(3,2, weight = 7)
G.add_edge(3,5, weight = 3)
G.add_edge(3,6, weight = 8)
G.add_edge(4,7, weight = 8)
G.add_edge(5,4, weight = 4)
G.add_edge(5,7, weight = 10)
G.add_edge(6,7, weight = 2)
edge_labels = nx.get_edge_attributes(G,'weight')
pos = nx.kamada_kawai_layout(G)
plt.figure()
nx.draw_networkx(G,pos)
nx.draw_networkx_edge_labels(G,pos,edge_labels)
plt.axis('off')
plt.show()
```




Formulate and solve the multi-target shortest path problem on this network (from the source node 1 to all other nodes). Next formulate and solve the dual of the shortest path problem and compare your results with that of the primal problem.