PARCIAL III JHONALBER RANGEL

import networkx as nx

import matplotlib.pyplot as plt

'''#FIRST EXERCISE

G = nx.Graph()

G.add\_nodes\_from(["A","B","C","D","E","F","G","H"])

G.add\_edge("A","B", weight = 1)

G.add\_edge("A","D", weight = 7)

G.add\_edge("B","C", weight = 1)

G.add\_edge("C","D", weight = 3)

G.add\_edge("B","D", weight = 2)

G.add\_edge("D","E",weight = 3)

G.add\_edge("A","H", weight = 5)

G.add\_edge("A","E", weight = 9)

G.add\_edge("B", "E", weight = 4)

G.add\_edge("E","H", weight = 1)

G.add\_edge("E","G", weight = 2)

G.add\_edge("E","F", weight = 6 )

G.add\_edge("F","H", weight = 3)

G.add\_edge("G", "H", weight = 2)

pos = nx.spring\_layout(G)

nx.draw(G, pos, with\_labels = True, font\_weight = "bold", node\_color = "cyan", edge\_color= "black")

edge\_weight = nx.get\_edge\_attributes(G, 'weight')

nx.draw\_networkx\_edge\_labels(G,pos, edge\_labels= edge\_weight)

path = nx.dijkstra\_path(G, source = "A", target = "G")

print("Ruta = ".format("desde: ", "A", "hasta: ", "G"), path)

distance = nx.dijkstra\_path\_length(G, source = "A", target = "G")

print("La distancia es = ".format("A","G"),distance)

plt.show()'''

'''#SECOND EXERCISE

J = nx.Graph()

J.add\_nodes\_from(["Bogota","Lima","Quito","La Paz","Asunción","B. Aires"])

J.add\_edge("Bogota","Quito", weight = 2)

J.add\_edge("Bogota","Lima", weight = 4)

J.add\_edge("Lima","Quito", weight = 1)

J.add\_edge("Quito","La Paz", weight = 8)

J.add\_edge("Quito","Asunción", weight = 10)

J.add\_edge("Lima","Asunción", weight = 7)

J.add\_edge("Lima","La Paz", weight = 5)

J.add\_edge("La Paz","Asunción", weight = 2)

J.add\_edge("B. Aires","La Paz", weight = 6)

J.add\_edge("B. Aires","Asunción", weight = 3)

pos = nx.spring\_layout(J)

nx.draw(J, pos, with\_labels = True, font\_weight = "bold", node\_color = "cyan", edge\_color= "black")

edge\_weight = nx.get\_edge\_attributes(J, 'weight')

nx.draw\_networkx\_edge\_labels(J,pos, edge\_labels= edge\_weight)

start = str(input("ingrese desde donde empezará?  "))

finish = str(input("Ingrese hasta donde llegará?  "))

path = nx.dijkstra\_path(J, source = start, target = finish)

print("Ruta = ".format("desde: ", start, "hasta: ", finish), path)

distance = nx.dijkstra\_path\_length(J, source = start, target = finish)

print("La distancia mas corta es = ".format(start,finish),distance)

plt.show()'''

'''#THIRD EXERCISE

S = nx.Graph()

S.add\_nodes\_from([0,1,2,3,4,5,6,7,8])

S.add\_edge(0,1, weight = 4)

S.add\_edge(0,6, weight = 7)

S.add\_edge(1,6, weight = 11)

S.add\_edge(1,7, weight = 20)

S.add\_edge(1,2, weight = 9)

S.add\_edge(6,7, weight = 1)

S.add\_edge(4,2 ,weight = 2)

S.add\_edge(4,7, weight = 1)

S.add\_edge(4,3, weight = 10)

S.add\_edge(4,8, weight = 5)

S.add\_edge(4,5, weight = 15)

S.add\_edge(7,8, weight = 3)

S.add\_edge(2,3, weight = 6)

S.add\_edge(3,5, weight = 5)

S.add\_edge(8,5, weight = 12)

pos = nx.spring\_layout(S)

nx.draw(S, pos, with\_labels = True, font\_weight = "bold", node\_color = "cyan", edge\_color= "black")

edge\_weight = nx.get\_edge\_attributes(S, 'weight')

nx.draw\_networkx\_edge\_labels(S,pos, edge\_labels= edge\_weight)

start = int(input("ingrese desde donde empezará?  "))

finish = int(input("Ingrese hasta donde llegará?  "))

path = nx.dijkstra\_path(S, source = start, target = finish)

print("Ruta = ".format("desde: ", start, "hasta: ", finish), path)

distance = nx.dijkstra\_path\_length(S, source = start, target = finish)

print("La distancia mas corta es = ".format(start,finish),distance)

plt.show()'''

F = nx.Graph()

F.add\_nodes\_from(["A","B","C","D","E","F","G","Z"])

F.add\_edge("A","B", weight = 2)

F.add\_edge("A","F", weight = 1)

F.add\_edge("B","D", weight = 2)

F.add\_edge("D","F", weight = 3)

F.add\_edge("D","E", weight = 4)

F.add\_edge("B","E", weight = 4)

F.add\_edge("B","C", weight = 2)

F.add\_edge("C","E", weight = 3)

F.add\_edge("C","Z", weight = 1)

F.add\_edge("Z","G", weight = 6)

F.add\_edge("E","G", weight = 7)

F.add\_edge("G","F", weight = 5)

pos = nx.spring\_layout(F)

nx.draw(F, pos, with\_labels = True, font\_weight = "bold", node\_color = "cyan", edge\_color= "black")

edge\_weight = nx.get\_edge\_attributes(F, 'weight')

nx.draw\_networkx\_edge\_labels(F,pos, edge\_labels= edge\_weight)

print("Por favor indique la ruta en MAYUSCULAS")

start = str(input("ingrese desde donde empezará?  "))

finish = str(input("Ingrese hasta donde llegará?  "))

path = nx.dijkstra\_path(F, source = start, target = finish)

print("Ruta = ".format("desde: ", start, "hasta: ", finish), path)

distance = nx.dijkstra\_path\_length(F, source = start, target = finish)

print("La distancia mas corta es = ".format(start,finish),distance)

plt.show()

G = nx.Graph()

G.add\_nodes\_from(["Riohacha","Mingueo","S.Marta","Barranquilla","Cartagena","Arjona","C.Biso","Calamar","Fundacion","Bosconia","Valledupar","Fonseca","Albania","Plato","C. de Bolivar","Ovejas","Sincelejo","Momil","Lorica","Tolu","S.Onofre","T.Viejo","M. la baja"])

G.add\_edge("Riohacha","Mingueo", weight = 70.81);

G.add\_edge("Riohacha","Albania", weight = 73.6);

G.add\_edge("Mingueo","S.Marta", weight = 97.7);

G.add\_edge("S.Marta","Barranquilla", weight = 105);

G.add\_edge("Fundacion","S.Marta", weight = 97.2);

G.add\_edge("Fundacion","Calamar", weight = 218);

G.add\_edge("Fundacion","Bosconia", weight = 70.9);

G.add\_edge("Bosconia","Valledupar", weight = 95.8);

G.add\_edge("Valledupar","Fonseca", weight = 62.2);

G.add\_edge("Fonseca","Albania", weight = 52.8);

G.add\_edge("Bosconia","Plato", weight = 112);

G.add\_edge("Plato","C. de Bolivar", weight = 43.8);

G.add\_edge("Calamar","Plato", weight = 115);

G.add\_edge("Calamar","C.Biso", weight = 54.2);

G.add\_edge("Calamar","Barranquilla", weight = 93.7);

G.add\_edge("Barranquilla","Cartagena", weight = 119);

G.add\_edge("Cartagena", "Arjona", weight = 22.8);

G.add\_edge("Arjona","C.Biso", weight = 20.1);

G.add\_edge("C.Biso","M. la baja", weight = 23.5);

G.add\_edge("M. la baja","S.Onofre", weight = 42.8);

G.add\_edge("S.Onofre","T.Viejo", weight = 38.4);

G.add\_edge("T.Viejo","Tolu", weight = 19.6);

G.add\_edge("T.Viejo","Sincelejo", weight = 21.7);

G.add\_edge("T.Viejo","Momil", weight = 42.3);

G.add\_edge("Tolu","Lorica", weight = 50.9);

G.add\_edge("Lorica","Momil", weight = 16.8);

G.add\_edge("Momil","Sincelejo", weight = 45);

G.add\_edge("Sincelejo","Ovejas", weight = 43.5);

G.add\_edge("Ovejas","C. de Bolivar", weight = 25.2);

pos = nx.spring\_layout(G)

nx.draw(G,pos, with\_labels = True, font\_weight = "bold", node\_color = "cyan", edge\_color = "black")

edge\_weight = nx.get\_edge\_attributes(G,'weight')

nx.draw\_networkx\_edge\_labels(G,pos,edge\_labels = edge\_weight)

path = nx.dijkstra\_path(G, source = "Lorica", target = "Riohacha")

print("Ruta = ".format("Lorica", "Riohacha"),path)

distance = nx.dijkstra\_path\_length(G, source = "Lorica", target = "Riohacha")

print("La distancia entre = ".format("Lorica","Riohacha"), distance)

plt.show()