import sys

VERTICES = 6

START = 1

connections = [

    [0, 0, 0, 0, 0, 0],

    [0, 0, 0, 0, 0, 0],

    [0, 0, 0, 0, 0, 0],

    [0, 0, 0, 0, 0, 0],

    [0, 0, 0, 0, 0, 0],

    [0, 0, 0, 0, 0, 0]

]

connections[0][1] = 1

connections[1][2] = 7

connections[1][4] = 5

connections[4][1] = 1

connections[2][4] = 3

connections[4][3] = 1

def pathfinder(connections, start):

    visited = [False] \* VERTICES

    distances = [sys.maxsize] \* VERTICES

    distances[start] = 0

    while True:

        minimal\_index = sys.maxsize

        minimal\_weight = sys.maxsize

        for i in range(VERTICES):

            if not visited[i] and distances[i] < minimal\_weight:

                minimal\_index = i

                minimal\_weight = distances[i]

        if minimal\_index == sys.maxsize:

            break

        for i in range(VERTICES):

            if connections[minimal\_index][i]:

                temp = minimal\_weight + connections[minimal\_index][i]

                if temp < distances[i]:

                    distances[i] = temp

        visited[minimal\_index] = True

    for i in range(VERTICES):

        if distances[i] != sys.maxsize:

            print(f"Вага маршруту: {start} -> {i} = {distances[i]:<6}", end="\t")

            end = i

            weight = distances[end]

            way = f"{end} >- "

            while end != start:

                for j in range(VERTICES):

                    if connections[j][end]:

                        temp = weight - connections[j][end]

                        if temp == distances[j]:

                            end = j

                            weight = temp

                            way += f"{j} >- "

            print("Шлях: ", end="")

            for j in range(len(way)-5, -1, -1):

                print(way[j], end="")

            print()

        else:

            print(f"Вага маршруту: {start} -> {i}  ...  Такого маршруту не існує")

pathfinder(connections, START)