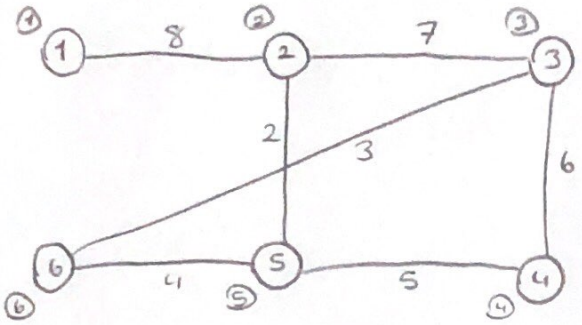
Greedy Algorithm (Counter Example)



Greedy algorithm picks the two most populated districts (nodes/vertices) and builds the two hospitals there. However, that doesn't give the optimal solution.

Distances

	1	2	3	4	5	6
1	0	8	15	15	10	14
2	8	0	7	7	2	6
3	15	7	0	6	7	3
4	15	7	6	0	5	9
5	10	2	7	5	0	4
6	14	6	3	9	4	0

Multiplied by node weight →

	1	2	3	4	5	6	Sum of rows
1	0	8	15	15	10	14	→ 62
2	16	0	14	14	4	12	→ 60
3	45	21	0	18	21	9	→ 114
4	60	28	24	0	20	36	→ 168
5	50	10	35	25	0	20	→ 140
6	84	36	18	54	24	0	→ 216
	↓	↓	↓	↓	↓	↓	
	255	103	106	126	79	91	

Greedy algorithm would choose 4th and 6th districts to build the hospitals. However, this is wrong. Because the optimal solution would be choosing 5th and 6th districts. Because the cost of people coming from all other districts to one of the hospitals in 5th or 6th districts (whichever costs less) overall costs minimum. Therefore, building on 5th and 6th districts would be the optimal solution.