Homework #2 (Due April 22)

Solving the multi-facility Weber Problem with unit demand using k-means algorithm and Variable Neighborhood Search

In this homework, you are going to solve the multi-facility Weber problem with unit demand, i.e., all the customers have unit demand. The data set is called p654 and the 654 customer locations are provided on the web page http://mistic.heig-vd.ch/taillard/problemes.dir/mwp.dir/p654.txt. The data set includes the x-coordinates and y-coordinates of customers. The distances between customer locations are measured via Euclidean distance. You can also find the optimal value on the same page.

1. Solve the instance five times (five different initializations) with 3 facilities using the k-means algorithm and VNS. For VNS, use assignment neighborhoods that changes the assignment of one, two, and three customers)

2. Repeat (1) with 5 facilities.

3. Repeat (1) with 8 facilities.

Instance	Run	Best Known/Optimal	k-means (% Dev from Best Known /Optimal)	VNS (% Dev from Best Known / Optimal)	CPU Time (sec)
p=3	1	551062.8811			
p=3	2	551062.8811			
p=3	3	551062.8811			
p=3	4	551062.8811			
p=3	5	551062.8811			
Best					
p=5	1	209068.7935			
p=5	2	209068.7935			
p=5	3	209068.7935			
p=5	4	209068.7935			
p=5	5	209068.7935			
Best					
p=8	1	147050.7904			
p=8	2	147050.7904			
p=8	3	147050.7904			
p=8	4	147050.7904			
p=8	5	147050.7904			
Best					