Exercise 6-1:

For the center selection problem (where centers should be selected from the given sites), we have the following four algorithms.

1. **Center selection algorithm (i.e., Distance-based greedy inclusion algorithm).**
2. **Distance-based greedy removal algorithm.**
3. **Greedy inclusion algorithm based on the original objective function.**
4. **Greedy removal algorithm based on the original objective function.**

Create a simple example to clearly explain the characteristic features of each algorithm and also to clearly explain the differences among them.

Exercise 6-2:

Create another interesting example to clearly explain the characteristic features of each of the four algorithms and also to clearly explain the differences among them.

Exercise 6-3:

For the center selection problem (with no additional constraint condition), we have the following three formulations.

(1) Minimization of the maximum distance from each site to the nearest center.

$$\text{Minimize} \ \max_{s \in S} dist(s, C)$$

(2) Minimization of the total squared distance from each site to the nearest center

$$\text{Minimize} \ \sum_{s \in S} dist(s, C)^2$$

(3) Minimization of the total distance from each site to the nearest center

$$\text{Minimize} \ \sum_{s \in S} dist(s, C)$$

Create a simple example to clearly explain the characteristic features of each formulation and also to clearly explain the differences among them.

Exercise 6-4:

Create another interesting example to clearly explain the characteristic features of each of the three formulations and also to clearly explain the differences among them.