Advanced Algorithm Assignment 4 Center Selection Problem

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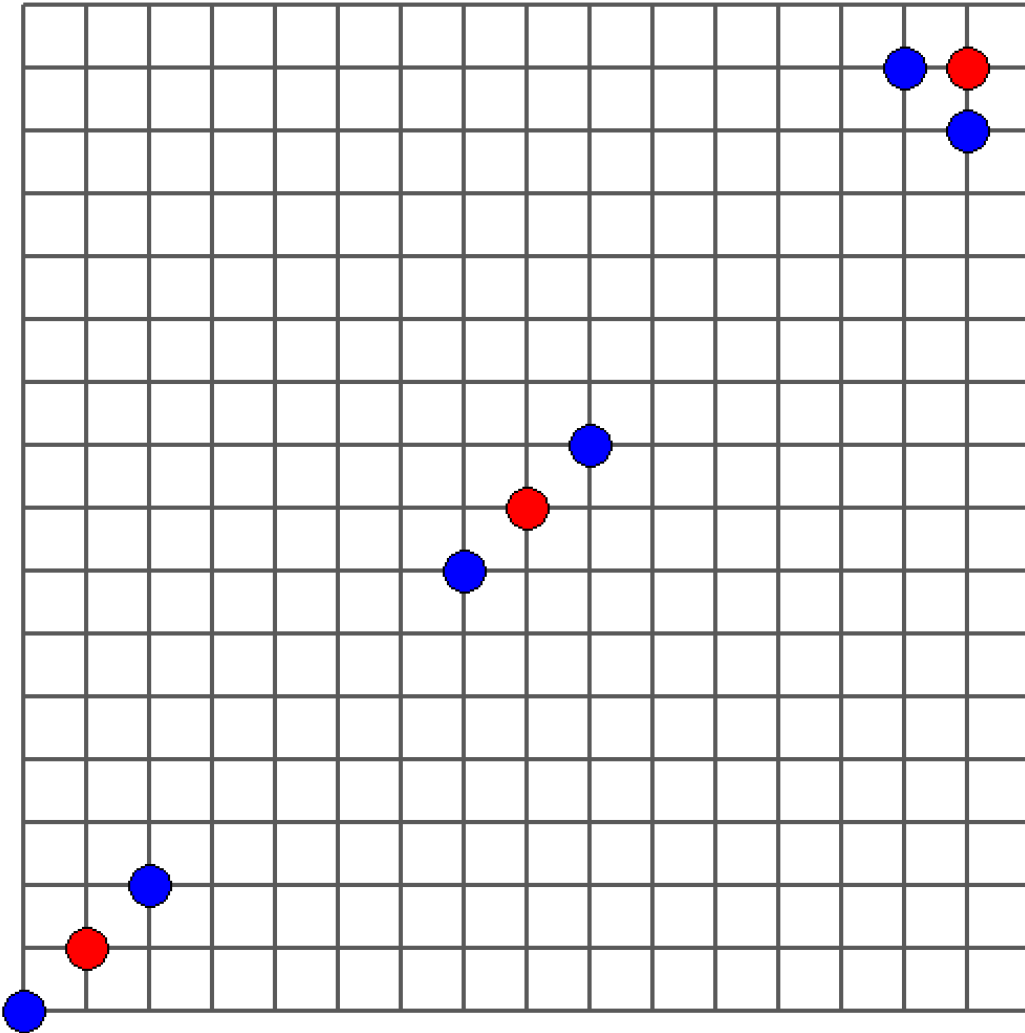
Yuxi Liu

context

- Exercise 3-1

- Exercise 3-2

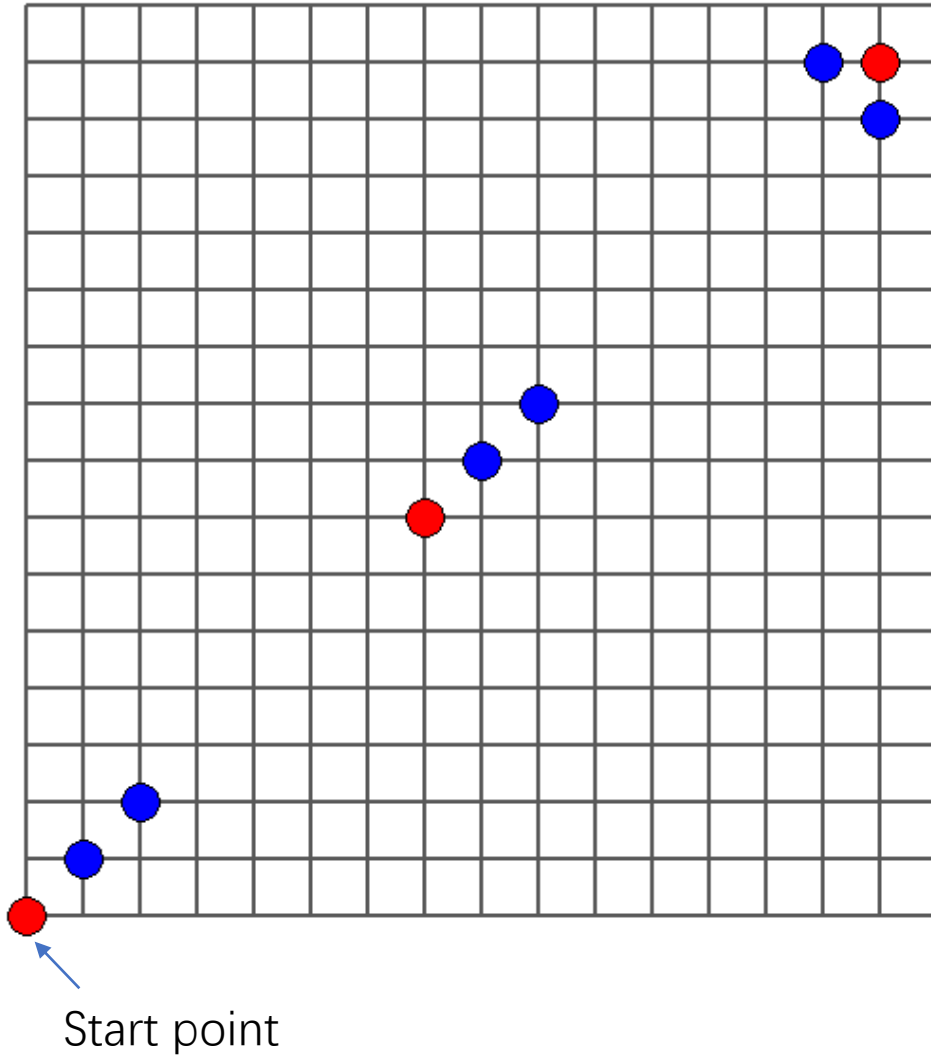# Exercise 3-1

Optimal condition:

$$r(\text{C}^*) = \sqrt{2}$$
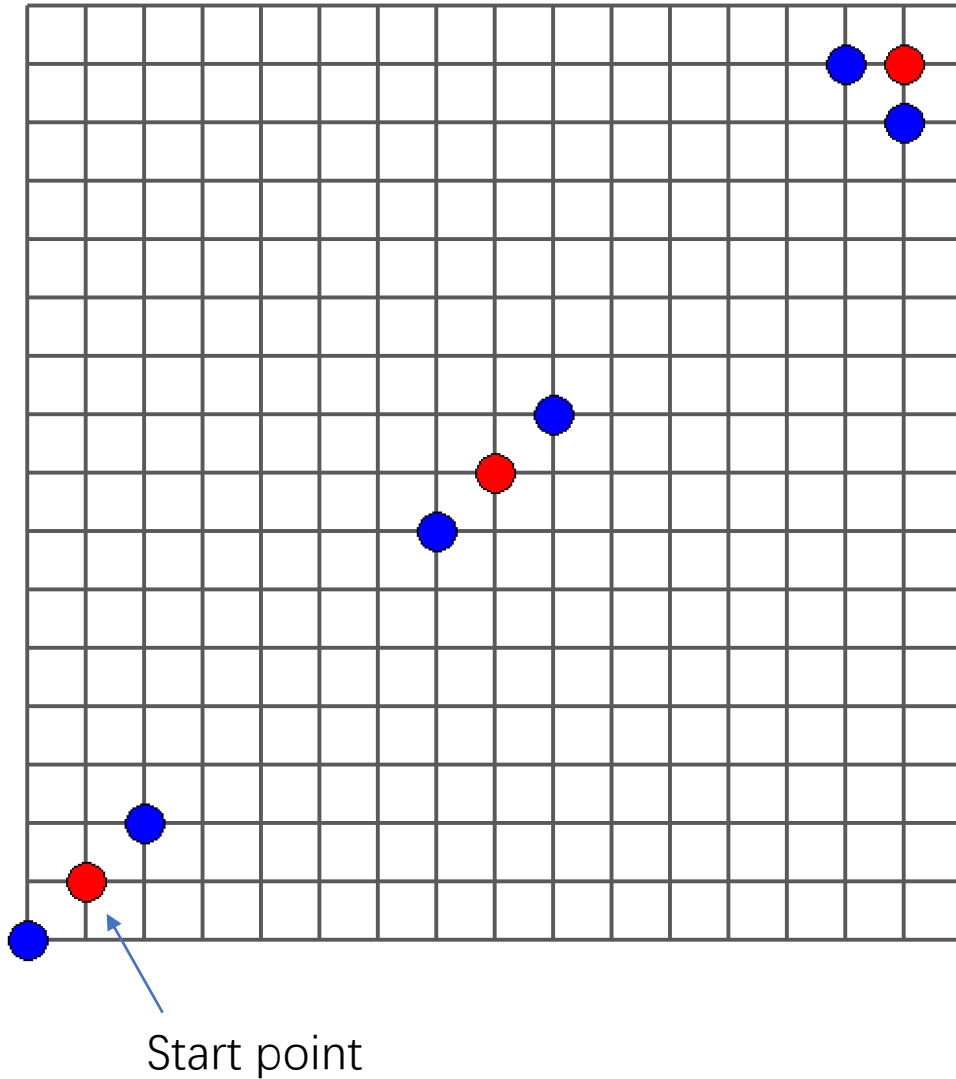
Exercise 3-1

Center Selection Algorithm:

$$r(C) = 2\sqrt{2}$$

$$r(C) = r(C^*)$$

Start point

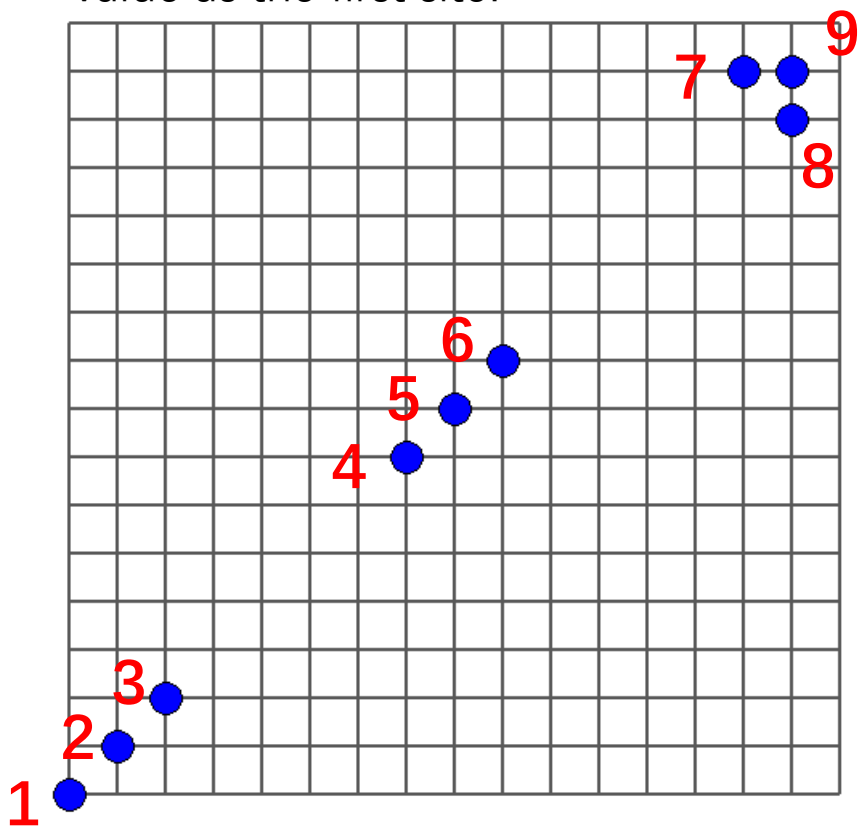# Exercise 3-1

Optimal condition:

$$r(C) = \sqrt{2}$$

$$r(C) = r(C^*)$$
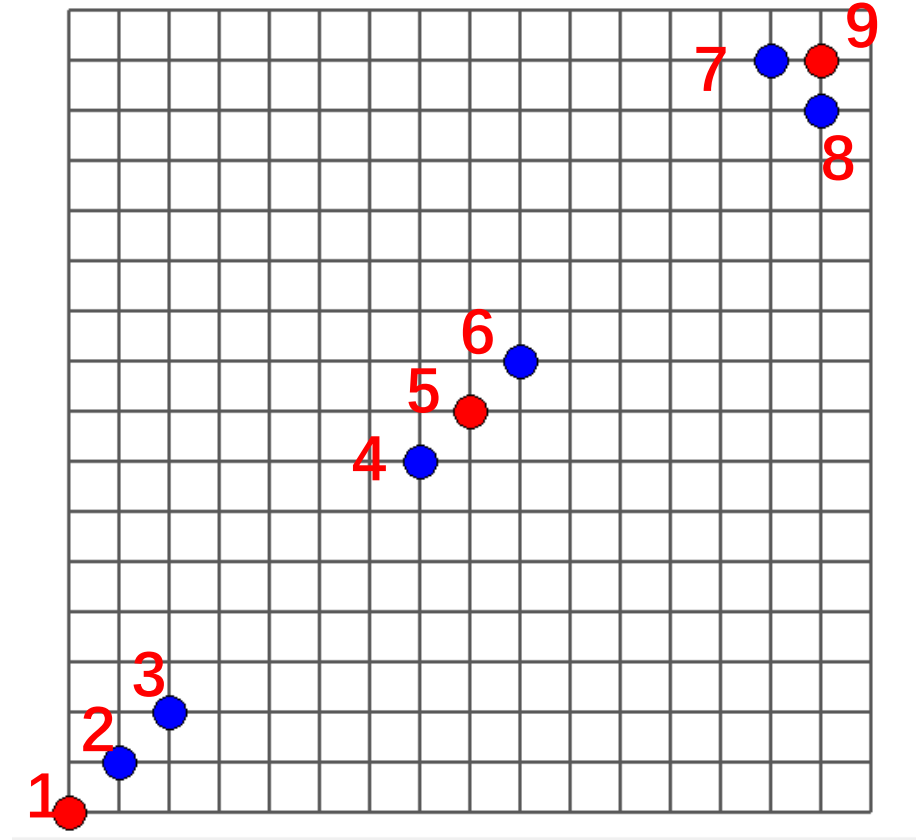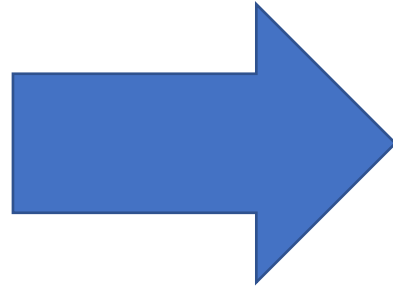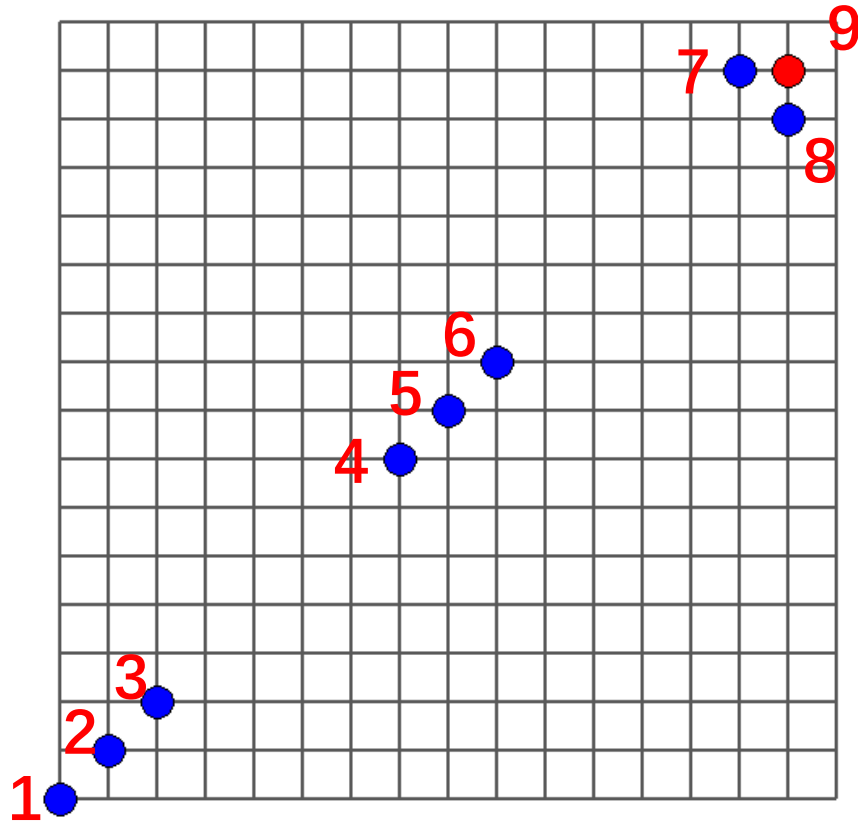
Start point

Exercise 3-2

We assume that we have N points and we need to select K centers.
First, we caculate the distance between any two points, and then we calculate the sum of the distances from the nearest $\left\lceil \frac{N}{K} \right\rceil - 1$ points of each point. Finally, we choose the one with the smallest value as the first site.

$$\left\lceil \frac{N}{K} \right\rceil - 1 = 2$$

Point	Sum_distances	The nearest points
1	$3\sqrt{2}$	2、3
2	$2\sqrt{2}$	1、3
3	$3\sqrt{2}$	2、1
4	$3\sqrt{2}$	5、6
5	$2\sqrt{2}$	4、6
6	$3\sqrt{2}$	4、5
7	$1+\sqrt{2}$	8、9
8	$1+\sqrt{2}$	7、9
9	2	7、8

Exercise 3-2

Thank you