



JOINT INSTITUTE

交大密西根学院

Name:

Student ID:

Course Code:

Date:

Assignment 2

steps	in-place pivot	0 1 2 3 4 5 6 7 8 9
0	origin :	3 7 4 1 8 9 2 6 5 10
1	8	8 7 4 1 3 9 2 6 5 10
2	8	8 7 4 1 3 2 6 5 10 9
3		8 4 1 3 2 6 5 10 9 7
4	5	5 7 4 1 3 2 6
6	5	5 4 1 3 2 6 7
7		2 4 1 3 5 6 7
8	3	3 4 1 2
9	3	3 1 2 4
10		2 1 3 4
11		1 2 3 4
12		6 7
13		9 10

pivot = $m(3, 8, 10) = 8$

swap 8 - 3

Partitioning ①

swap 5 - 8

pivot A = $m(5, 1, 6) = 5$

partitioning ②

swap 5, 2.

pivot C = $m(2, 4, 3) = 3$

partitioning ③

swap 3 - 2

insertion sort C

insertion sort D

insertion sort B

finished.

14 1 2 3 4 5 6 7 8 9 10

2. origin: 189, 479, 032, 538, 446, 526, 943, 738, 632, 379,

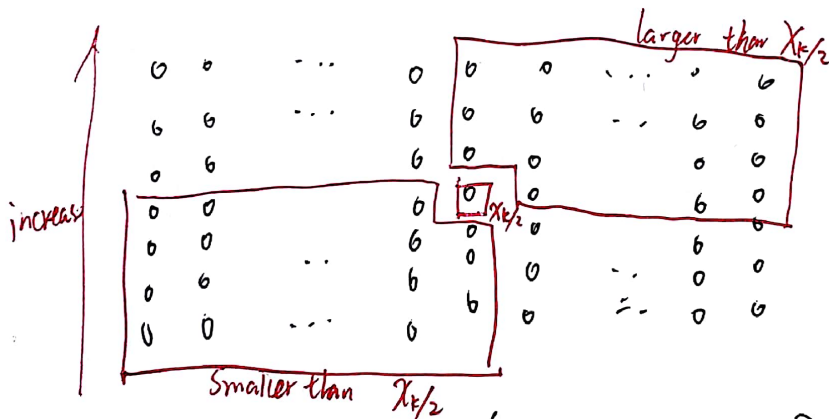
Step:	0	1	2	3	4	5	6	7	8	9
1			032 632	943			446 526		538 738	189 479 379
2			526	032 632 538 738	943 446		479 379		189	
3	032	189		379	479	526 538	632	738		

finished: 032, 189, 379, 479, 526, 538, 632, 738.

3. There exists a positive constant C such that:

$$T(1) \leq C$$

$$T(n) \leq cn + T\left(\frac{n}{7}\right) + T(?).$$



At least $\sim \left(\frac{4}{7}\right) \times \left(\frac{1}{2}\right) = \frac{2}{7}$, $\therefore ? = 1 - \frac{2}{7} = \frac{5}{7}n$

$$\therefore T(n) \leq cn + T\left(\frac{n}{7}\right) + T\left(\frac{5}{7}n\right) \leq cn + 2cn + 10cn \leq 13cn$$

So the run time is still $O(n)$.