Sorting Practice

P1. A) (6 points) You are using count sort to sort an array of N numbers, where each number is from the range [0,M]. What is the time complexity (as Theta) of the number of data moves? (For example swapping two records requires 3 data moves.). Briefly justify your answer.

Data is the records in the original array (not the count array). => 2N (N to put in sorted order in the copy array and another N to copy back in the original array.)

B) (2 points) Is quick sort stable? (No justification needed.)

No.

C) (7 points) We make the call: `int res = partition(a, 0, 6);`

for each of the 2 example arrays **a** given in the table below. Show in the table below how the arrays look after the call and the value returned in `res`. Use the partition method from Cormen.

	0	1	2	3	4	5	6	res
Original array **a** example 1	**13**	**6**	**12**	**8**	**6**	**15**	**10**	
Array after partition	**6**	**8**	**6**	**10**	**12**	**15**	**13**	**3**
Original array **a** example 2	**17**	**11**	**12**	**6**	**3**	**8**	**9**	
Array example 2 after partition	**6**	**3**	**8**	**9**	**11**	**12**	**17**	**3**

P2. (4 points) What is the operation you do to map/scale values from range [A,B] to range [X,Y]? You can assume that A < B and X < Y. (E.g. [47,49] -> [20,30], [5,10] -> [21,23])

See slides.