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159.201 Algorithms & Data Structures
Summer 2014

Tutorial 7

1. For the following arrays:

array 1 = {1,2,3,4,5} (already sorted)

array 2 = {5,4,3,2,1} (reverse order)

array 3 = {3,4,2,5,1} (random order)

compile the number of comparisons used for each of the following algorithms:

	N=5		
	Random	reverse	sorted
Selection			
Insertion			
Bubble			

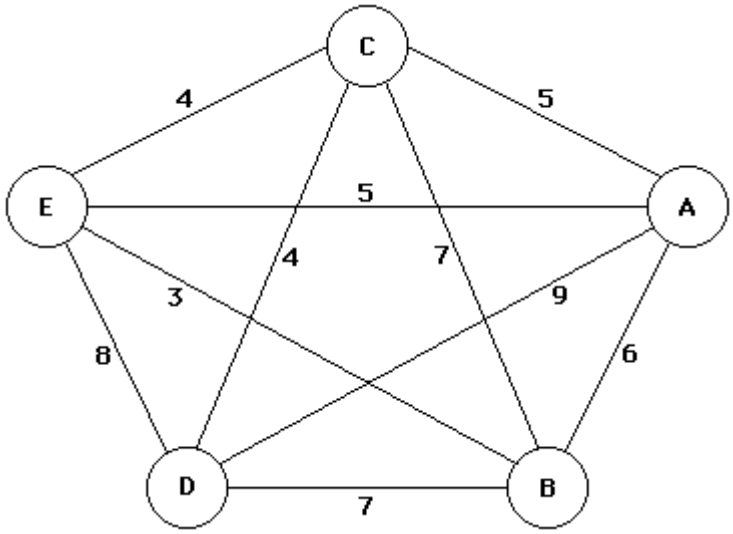
Discuss the differences between the algorithms.

2. Write an algorithm (not a C++ program) that implements a sorting algorithm based on the Heap. There are two phases:

phase 1 reads the data in some order and builds the Heap (using Insert()).

phase 2 deletes the root of the Heap, and copy the deleted node to a temporary array.

3. Use the graph below to solve the Travelling Salesperson Problem, starting at E. The total "distance travelled" (sum of weights) must be <= 26.



(a) Use the Branch & Bound method. Start with a bound of 5 and increase it by 5 at each step.

(b) Use a Greedy Algorithm which always takes the shortest available path.

Comment on the differences between (a) and (b).