

Discussion #11: Sorting and Graphs

1. Show the steps taken by selection sort with the following array.

30	12	76	34	5	28

2. a) Given the following partially sorted array, what would the next three steps taken by insertion sort be?

Sorted					Unsorted		
2	18	22	24		6	19	30

- b) How many element shifts take place during these three insertions (assuming a simple array-based implementation where each value must be moved individually)?
3. Explain in your own words why merge sort is less computationally complex than the $O(n^2)$ sorting algorithms (insertion sort, selection sort, bubble sort, ...).

4. Bogosort is a particularly bad sorting algorithm described by the following pseudocode

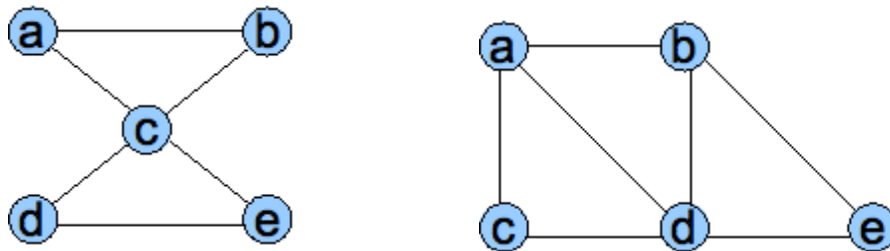
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function bogosort(array)
  repeat
    array = random_permutation(array)
  until is_sorted(array)
    
```

What is the average complexity of bogosort?

5. Is it possible to have an undirected graph for which the sum of the degrees of the nodes in the graph is odd? Give an example of such a graph or explain why it is not possible.

6. From the lecture you know that an Euler circuit is a simple circuit containing every edge of a graph. Do these graphs have an Euler circuit?



7. Find the length of the shortest path from a to z.

