

Sorting Detective

Your goal is to identify which sorting algorithm is being used in which case. The first column in the table below contains an unsorted list of names. The last column contains a sorted list of names. Each intermediate column contains a partially sorted list of names.

Each intermediate column was constructed by beginning with the unsorted list and running one of the sorting algorithms that we learned about in class, stopping at some point before it finishes. Identify, below, which column was (partially) sorted with which algorithm.

Hint: Do not just execute each sorting algorithm, step-by-step, until it matches one of the columns. Instead, think about the invariants that are true at every step of the sorting algorithm.

Unsorted	A	B	C	D	E	Sorted
Carol	Bob	Alice	Bob	Bob	Alice	Alice
Linda	Carol	Bob	Carol	Carol	Bob	Bob
Patty	Eddie	Carol	Eddie	Eddie	Carol	Carol
Bob	Kelly	Dave	Alice	John	Gina	Dave
Eddie	Linda	Eddie	John	Kelly	Eddie	Eddie
Noah	Noah	Noah	Gina	Linda	Fred	Fred
Kelly	Patty	Kelly	Dave	Noah	Harry	Gina
John	John	John	Harry	Patty	Dave	Harry
Alice	Alice	Patty	Fred	Alice	Ina	Ina
Mary	Mary	Mary	Kelly	Dave	Mary	John
Gina	Gina	Gina	Ina	Gina	Linda	Kelly
Dave	Dave	Linda	Linda	Mary	John	Linda
Harry	Harry	Harry	Mary	Harry	Kelly	Mary
Fred	Fred	Fred	Noah	Fred	Noah	Noah
Ophelia	Ophelia	Ophelia	Ophelia	Ophelia	Ophelia	Ophelia
Ina	Ina	Ina	Patty	Ina	Patty	Patty

 C : BubbleSort

 B : SelectionSort

 A : InsertionSort

 D : MergeSort

 E : QuickSort (with first element pivot)