	R	al		h	S			X	X	+	S												
E	(1)	m		QU	le:	st	ic	n															
Г		/ 2	D	,	a	,.	,		.,,														

e) Sorting algorithms:

Below you see four sequences of snapshots, each obtained during the execution of one of the following five algorithms: InsertionSort, SelectionSort, QuickSort, MergeSort, and BubbleSort. For each sequence, write down the corresponding algorithm.

8	6	4	2	5	1	3	7
6	4	2	5	1	3	7	8
4	2	5	1	3	6	7	8

8	6	4	2	5	1	3	7	
1	6	4	2	5	8	3	7	
1	2	4	6	5	8	3	7	_

Algorithm:

Algorithm:



Algorithm:

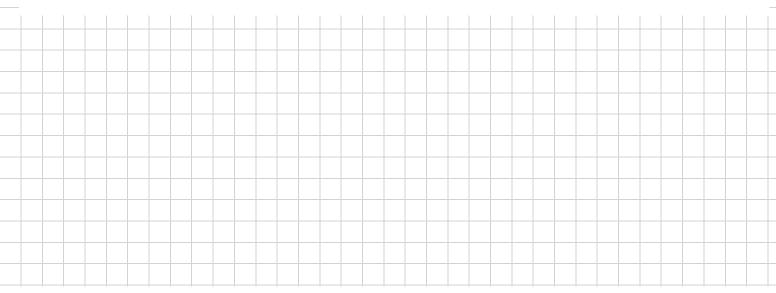
Algorithm:

There	1													true	false
	exist ar	rays of	length r	n which	ch ca	n be	sorte	d wit	h Bu	bble	Sor	t aft	er		
There	exist ar	rave of	length n	for v	which	the	runtii	ne of	Tne	ert i	ons	ort	is $\Theta(n)$		
There	CAIST ALL	ays or	length /	, 101 V	VIIICII	UIIC	- I	ile of	1113		.0115	010	15 0(11)	-	
Consid	der a sec	nence	of $n$ nur	$_{ m nbers}$	$\{x_1,$					$x_i \leq$	1000	), $\forall i$ :	= 1,,	n,	
						ithm	with	mint	ma						
is give	n as inp	ut. The	ere exist	s an	algor	ithm	with	runt	ime						
is give		ut. The	ere exist	s an	algor	ithm	with	runt	ime						
is give	n as inp	ut. The	ere exist	s an	algor	ithm	with	runt	ime						
is give	n as inp	ut. The	ere exist	s an	algor	ithm	with	runt	ime						
is give	n as inp	ut. The	ere exist	s an	algor	ithm	with	runt	ime						
is give	n as inp	ut. The	ere exist	s an	algor	ithm	with	runt	ime						
is give	n as inp	ut. The	ere exist	s an	algor	ithm	with	runt	ime						
is give	n as inp	ut. The	ere exist	s an	algor	ithm	with	runt	ime						
is give	n as inp	ut. The	ere exist	s an	algor	ithm	with	runt	ime						
is give	n as inp	ut. The	ere exist	s an	algor	ithm	with	runt	ime						
is give	n as inp	ut. The	ere exist	s an	algor	ithm	with	runt	ime						
is give	n as inp	ut. The	ere exist	s an	algor	ithm	with	runt	ime						

i) Consider the sequence 6,5,4,1,2,3. How many swaps does Bubble Sort perform to sort this sequence? Give the exact number of swaps required.



ii) Consider the sequence 6, 5, 4, 1, 2, 3. How many swaps does Selection Sort perform to sort this sequence? Give the exact number of swaps required.



iii) Let  $n \in \mathbb{N}$  be an even number and consider the sequence with the following structure:

$$2, 1, 4, 3, 6, 5, \ldots, n, n-1.$$

How many swaps does Insertion Sort perform to sort this sequence? Give the exact number, not just the asymptotics.