Last name		Grade	
First name		Grade	

$egin{aligned} & ext{Algorithmics} \ & ext{Undergraduate} \ & ext{1}^{st} \ ext{year} \ & ext{S1}\# \ & ext{Final Exam} \ \# 1 \ (\text{P1}) \ & ext{20 Juin 2019} \ & ext{Answer Sheets} \end{aligned}$

1	
2	
3	
4	
5	

Answers 1 (Stack or queue? - 2 points)

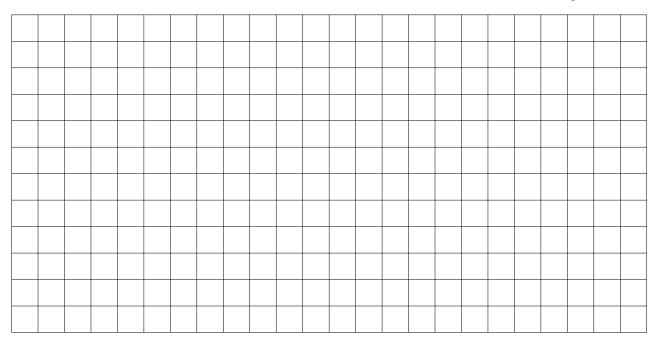
	stack	queue	neither
$A \ B \ C \ D \ E \ F$			
$B\ D\ E\ F\ A\ C$			
D E C B F A			

Answers 2 (Searching algorithms - 3 points)

	Sequential search			Binary search		
	cost = 1	maximum cost		$\cos t = 1$	maximum cost	
	value?	value?	cost?	value?	value?	cost?
(a) $n = 20$						
(b) $n = 100$						

Answers 3 (Sorted - 3 points)

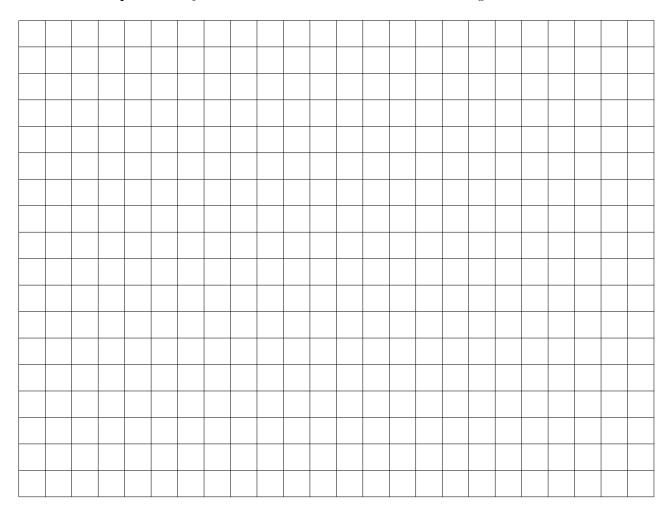
The function $is_sortedf(L)$ checks if the elements of the input list L are sorted in increasing order:



Answers 4 (Merge sort - 10 points)

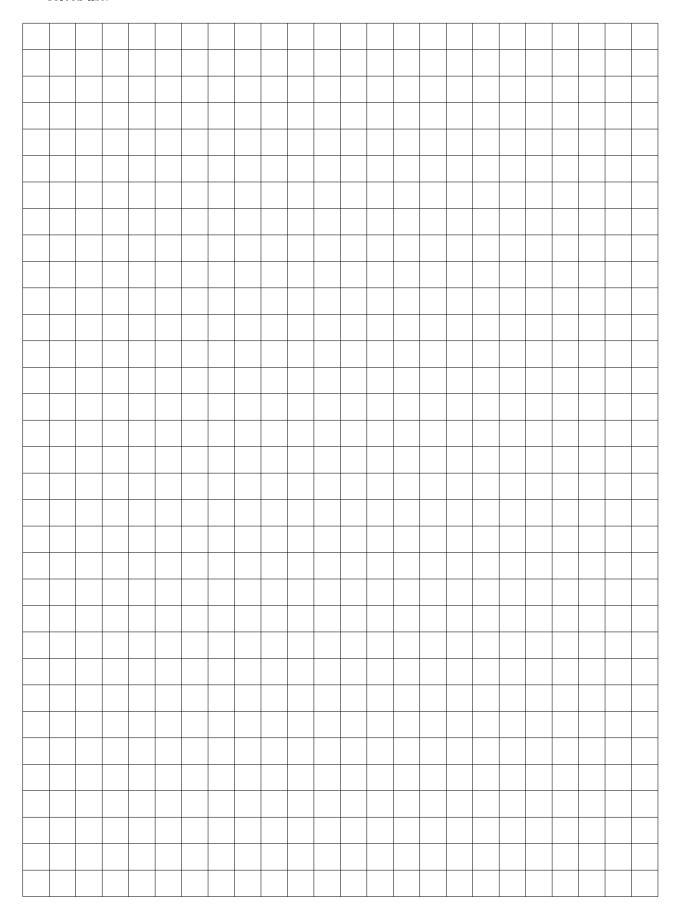
1. Specifications:

The function partition splits the list L into two lists of almost identical lengths: one half in each list.



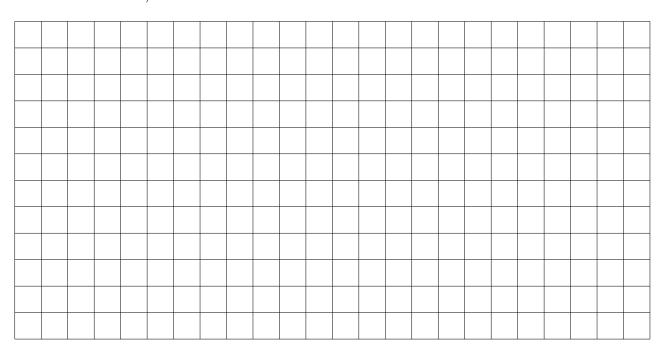
2. Specifications:

The function merge(L1, L2) merges the two sorted in increasing order lists L1 and L2 into one sorted list.



3. Specifications:

The function sort(L sorts the list L in increasing order (not "in place": the function builds and returns a new list.)



Answers 5 (What is it? -3 points)

1. Give the value of the list L after calling what(L, x) with:

(a)
$$L = [1, 2, 3, 4, 5, 6, 7]$$
 and $x = 2$
 $L =$

(b)
$$L$$
 = [1, 1, 1, 2, 2, 3, 3, 3, 4, 5, 5, 5] and x = 3 L =

(c)
$$L$$
 = [1, 1, 1, 2, 2, 3, 3, 3, 4, 5, 5, 5] and x = 5 L =

(d)
$$L = [1, 3, 5, 7, 9]$$
 and $x = 2$

$$L =$$

2. Let L be a list of integers sorted in increasing order $[e_0, e_1, \cdots, e_{n-1}]$ and x an integer.

What is $\mathsf{what}(L, x)$ doing?