Last name			
First name		Grade	
Group		Grade	

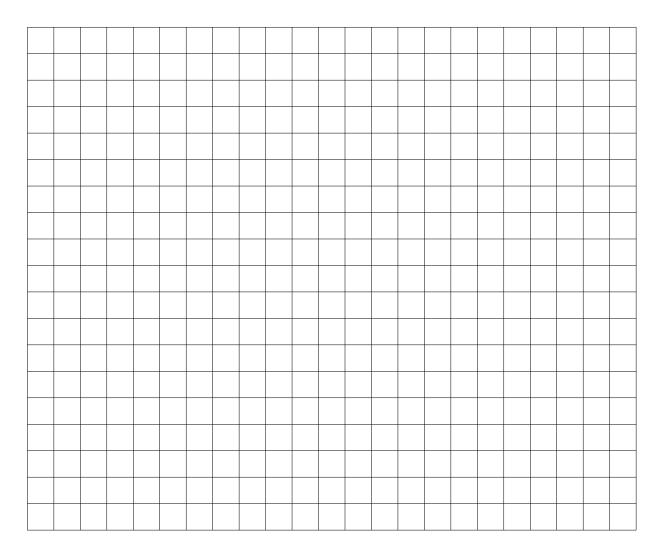
Algorithmics
Undergraduate $\mathbf{1}^{st}$ year $\mathbf{S2} \#$ Final Exam $\#\mathbf{2}$ (P2)
8 January 2019 - 11:00
Answer Sheets

1	
2	
3	
4	
5	
6	

Answers 1 (How many? - 3,5 points)

${\bf Specifications:}$

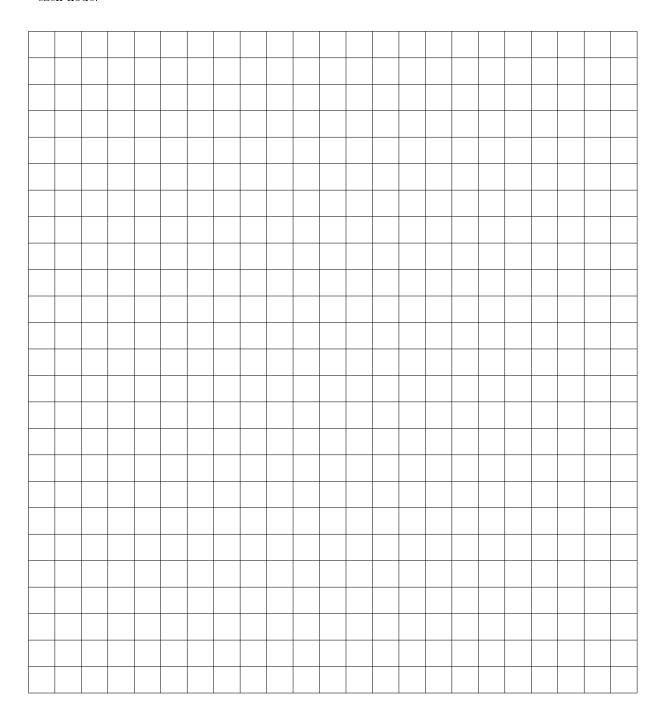
The function $nb_{inter(B, a, b)}$ computes the number of values of the binary search tree B in the interval [a, b[



$Answers \ 2 \ (\mathrm{BST} o \mathrm{AVL} - 4.5 \ points)$

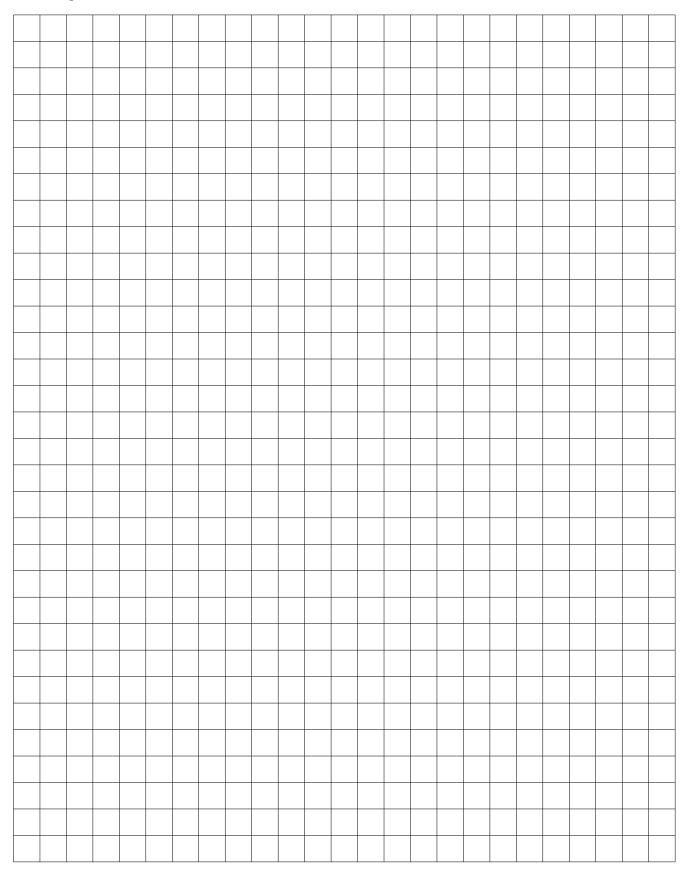
${\bf Specifications:}$

The function $\mathtt{makeAVL}(B)$ builds a copy of the binary tree B with the balance factors specified in each node.



${\bf Specifications:}$

The function addO(A) inserts the value 0 in the AVL A (that contains only non-zero naturals). It returns a pair: the tree after insertion and a boolean that indicates whether the tree height has changed.



Answers 4 (AVL - 3 points)

Tree built by insertions of 13, 20, 5, 1, 15, 10, 18:	
Tree after insertions of 25, 4 and 21:	
Tree after insertions of 7, 12 and 23:	

$Answers 5 \ (2.4\text{-tree} o ext{Red-black Tree} - 2 \ points)$

1.	Red- $black$	tree	associated	with	the	2-4	tree	of	the	subject:	
						,		- 3		3	

2.	Is this	$an\ AVL$?	YES -	NO

 ${\it Justification:}$

Answers 6 (Trees and mystery - 4 points)

1. Tree built by makeTree(13):

(a)

(b)

2.	Properties of the tree built by $makeTree(n)$ $(n > 0)$:	/

