Last name	
First name	
Group	
Tutorial Teacher	

Grade	

Algorithmics
Undergraduate 2^{nd} year - S3
Midterm #3 (C3)
9 November 2021 - 9 : 30
Answer Sheets

1	
2	
3	
4	
5	

Answers 1 **(Graphs and components... – *5 points*)**

1. The indegree array of G's vertices:

	1	2	3	4	5	6	7	8	9
indegrees									

2. The *preorder* traversal vertices of the graph G starting from the vertex 3 are :

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3. Is the graph G strongly connected ? YES NO
4. If NO, how many strongly connected components does it have ?
5. If they exist, which vertices of `G` have a degree equal to 0? Otherwise, put 0.

Answers 2 **(Large Family –** ***4 points*****)**

Specifications:

The function `morechildren(`T`)` checks if each internal node of the tree T (`TreeAsBin`) has strictly more children than its parent.

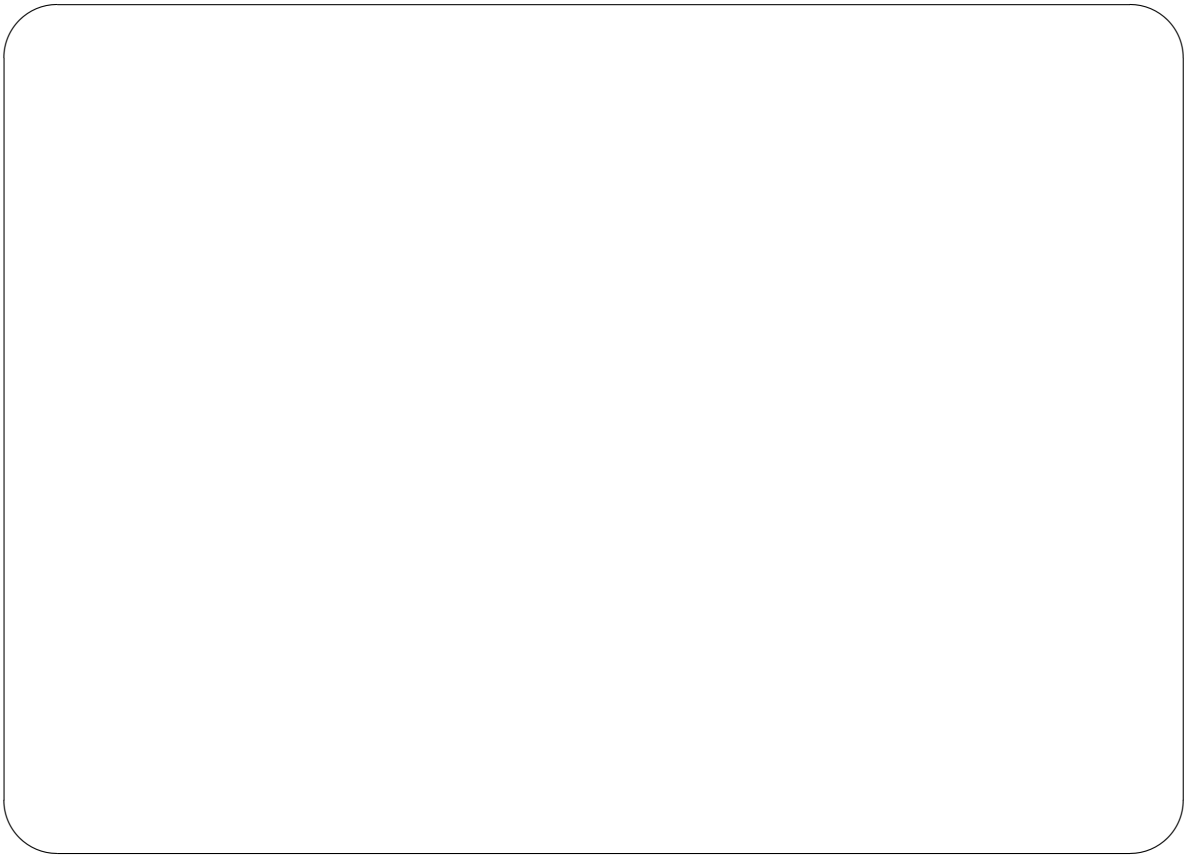
Answers 3 **(Decreasing –** ***4 points*****)**

Specifications:

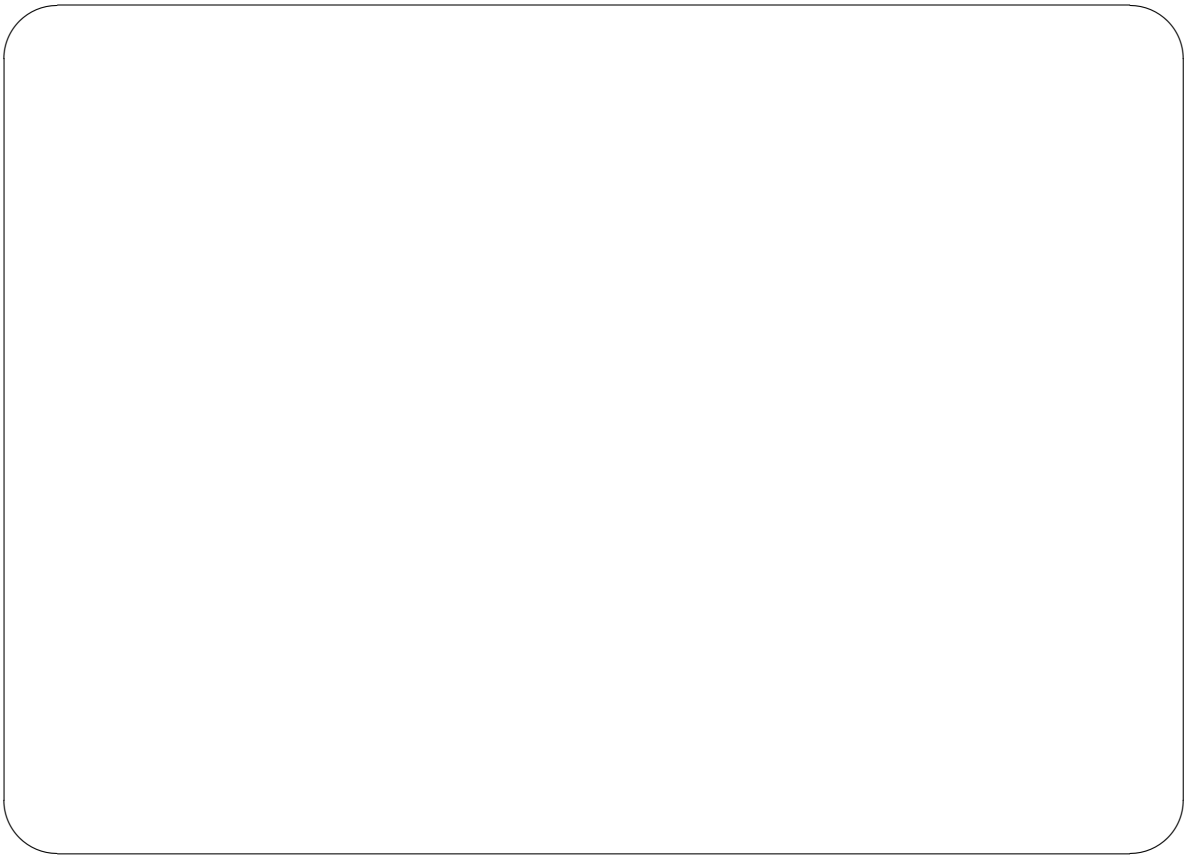
`decrease(`B`)` returns the list of the keys of the B-tree B in decreasing order.

Answers 4 **(B-tree: insertions and deletion –** ***3 points*****)**

1. Tree `B1` after the insertions of the values 11, 32, 20:



2. Tree `B2` after the deletion of the value 15:



***Answers 5* (What? – *4 points*)**

1.

	Returned result	*Call number*
(a) `mystery(B2, 0, 92)`		
(b) `mystery(B3, 0, 20)`		
(c) `mystery(B3, 1, 99)`		

2. *What does `mystery(B, a, b)` do?*