The Seybold Report

ISSN 1533-9211

DOI: 10.5281/zenodo.10209835

PYRAMID SORTING

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Annotation

Pyramid sorting is taught in most higher education institutions of our Republic. This article gives a methodology for easy explanation of pyramidal sorting to students using graphs and lists the complexity of the algorithm. The use of this methodology increases the effectiveness of the lesson.

Keywords: Pyramid Sorting, Array, Binary Graph, Binary Tree, Node Output Level, Binary Tree Rows, Algorithmic Complexity.

INTRODUCTION

In higher education institutions, as in all areas, the question of quality is brought to the fore. Sўкештп algorithms are being carried out in many higher educational institutions of our Republic. Currently, it is used in information and communication and new pedagogical taxnologies to improve the quality and effectiveness of the lesson. This article offers an easy way to explain pyramid sorting to students to improve lesson quality and effectiveness.

Pyramid sorting was proposed by Dj. Uilyame in 1964 and was named after R. Developed by Floyt. In this case, the array S is represented in the form of a binary tree D and does not require additional memory.

Main part

Consider pyramidal sorting using the example of array sorting below.

24	31	15	20	52	6	43	11	-	given array
1	2	3	4	5	6	7	8	-	array indexes

We will sort this array in descending order of pyramid. To do this, we create a binary tree corresponding to the array, the number of nodes in which is equal to the number of elements in the array (8 in our example). In a binary tree, nodes have an output level of 0, 1, or 2 and use levels. Fig. 1 shows levels with Roman numerals

Fig 1: Binary tree

ISSN 1533-9211
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We number the nodes of the resulting binary tree according to the elements of the array, starting from its left side. As a result, Fig. 2 will be created.

Fig 2: Binary tree

The framework of a binary tree looks like a pyramid. Therefore, this method is called Pyramidal sorting. The main idea of pyramidal sorting is to bring the numbers from the bottom of the pyramid to the top based on a certain law.

Let's get acquainted with the process of bringing the number 11 to the top of the pyramid in Fig. 2. The number 11 is compared to the number 20 next to it. Since the number 11 is less than 20, they are switched. The number 11 on the III level is compared with the number 52 on its right. The number 11 is less than 52, so the number 11 is compared to the number 31 in level II. Since the number 11 is less than 31, they are swapped. Now we compare 6 cones in level III with 15 in level II. Since the number 6 is less than 15, they are swapped. As a result of exchanges, the numbers 11 and 6 appear on the II level. Since the number 6 is less than 15, they are swapped. As a result, the smallest number of the given array -6 will reach the top of the pyramid. We write it at the end of the array being sorted (Fig. 3).

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

Fig 3: Sorted array

Then we replace the number 6 with the number 20, which is located at the very bottom of the pyramid, and paint the 6th node with a rusty color, that is, the painted node does not participate in the postponing processes (Fig. 4).

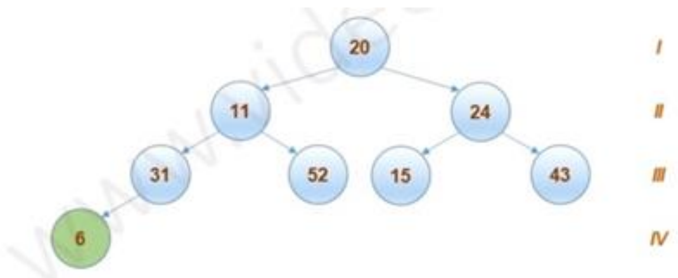

Fig 4: Binary tree

ISSN 1533-9211

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The operations performed above are repeated again: a small number located on the III level is found and it is raised to the top of the pyramid. 31 is compared with 52 (Figure 4). 31 is less than 52, so 31 is compared to 11. The number 31 is a multiple of 11, they cannot be replaced. The next numbers 15 and 43 on level III are compared. 15 is less than 43, so 15 and 24 are compared. Since the number 15 is less than 24, the places are changed. Numbers 11 and 15 in Level II are compared. Since 11 is less than 15, it is compared to 20. Since the number 11 is less than 20, its places are changed. Thus, the next number 11 has risen to the top of the pyramid. This means that the number 2 in the array has been found, and we will place it in the 2nd cell from the end of the sorted array (Fig. 5).

						11	**6**
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*

Fig 5: Sorted array

We replace the number 11 with the number 43, which is in the 2nd place from the end of the tree, and we paint the node on which the number 11 is located in Rust. The result is dressing the following binary tree.

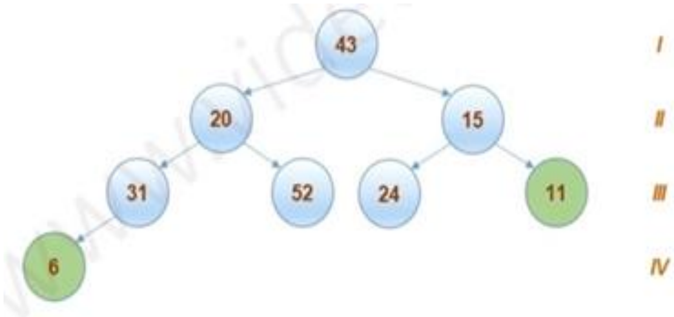

Figure 6: Binary tree

The number 24 in Figure 6 is compared to 52, and since the number 24 is less than 52, the number 24 is compared to 15. Since the number 24 is kata from 15, they are not replaced. The number 15 is compared to 43, with the number 15 being less than 43 so the positions are swapped. As a result, the 3rd element of the sorted array is found, which we place in Cell 3 from the end of the sorted array (Fig. 7).

					15	11	**6**
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*

Fig 7: Sorted array

Whether the number 15 and the number 24, which is in 3rd place from the end of the tree, will replace the places, as a result of which the following tree will be dressing.

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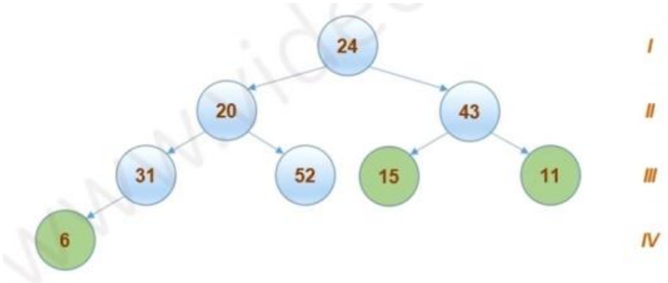

Fig 8

The numbers 31 and 52 in Figure 8 are compared, 31 because the number is less than 52 31 and 20 are solidified. Since the number 31 is kata from 20, they are not replaced. 43 is compared with the number 20, since the number 20 is less than 43, 24 is compared with the number 20, since the number 20 is less than 24, they are replaced by a relay. As a result, the 4th element of the sorted array is found, which we place in the 4th Cell from the end of the array (Fig. 9).

				20	15	11	**6**
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*

Fig 9: Sorted array

We alternate the positions of the number 20 at the top of the pyramid and the number 52 at the end of the tree, which is located in the 4th row, and paint the node in which the number 20 is located in a rusty color. The result is dressing Fig. 10 below.

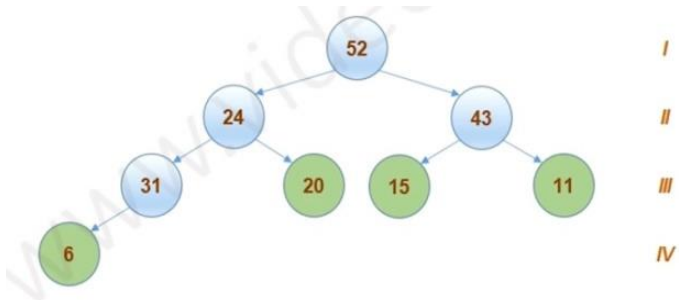

Fig 10: Binary tree

The numbers 24 and 43 in Figure 10 are compared, since the number 24 is less than 43, the number 24 is compared to 52. Since the number 24 is less than 52, their places are changed. As a result, the 5th element of the sorted array is found, we place it in the 5th cell from the end of the array (Fig. 11).

			24	20	15	11	**6**
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*

Fig 11: Sorted array

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We alternate the positions of the number 24, which is characteristic of the top of the pyramid, and the number 31, which is located in the 5th place from the end of the tree, and paint the node in which the number 24 is located in a rusty color. The result is dressing the following binary tree.

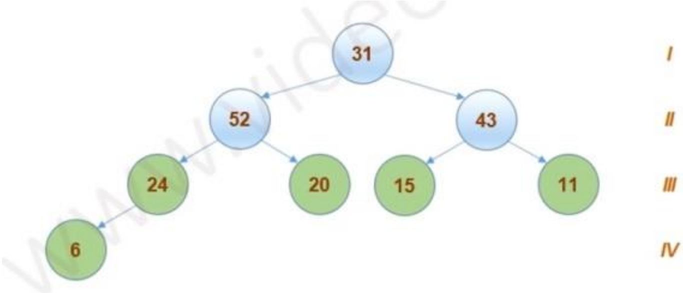

Fig 12: Binary tree

Numbers 52 and 43 in Figure 12 are compared. Since the number 43 is less than 52, the numbers 43 and 31 are compared. Since the number 43 is greater than 31, their places are not changed, that is, the number 31 is the 5th element of the array being sorted, we write it in the 5th cell from the end of the array (Fig. 13).

		31	24	20	15	11	**6**
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*

Fig 13: Sorted array

We replace the number 31 on the top of the pyramid and the number 43, which is 6th from the end of the tree, and paint the node on which the number 31 is located in a rusty color. The result is dressing the following tree.

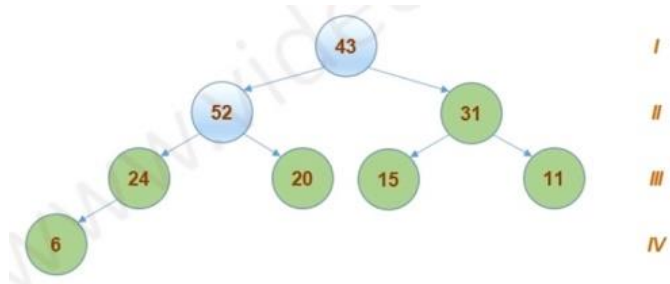

Fig 14: Sorted array

From the numbers 43 and 52, which we did not analyze, as can be seen from Figure 14, the number 42 is smaller, we place it in Cell 7 from the end of the array being sorted (Fig. 15).

	43	31	24	20	15	11	**6**
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*

Fig 15: Sorted array

The Seybold REPORT

ISSN 1533-9211

DOI: 10.5281/zenodo.10209835

We alternate the positions of numbers 43 and 52, and paint the node in which the number 43 is located in a rusty color. The result is dressing the following picture.

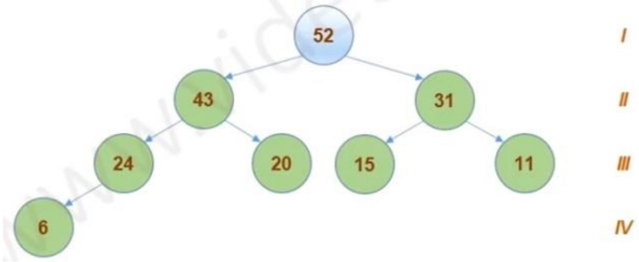

Fig 16: Binary tree

We write the number 52 on the 1st Indes of the array being sorted (Fig. 17).

52	43	31	24	20	15	11	**6**
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*

Fig 17

As can be seen from Fig. 17, the given array decreasing buoy sorted.

CONCLUSION

Pyramidal sorting is one of the most effective algorithms. Its complexity is equal to Q(ln(n)). The use of this Pyramidal sorting method in the educational process increases the effectiveness of the lesson.

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