Assignment 2 Writeup

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CS 315

Section 002

Problem Statement

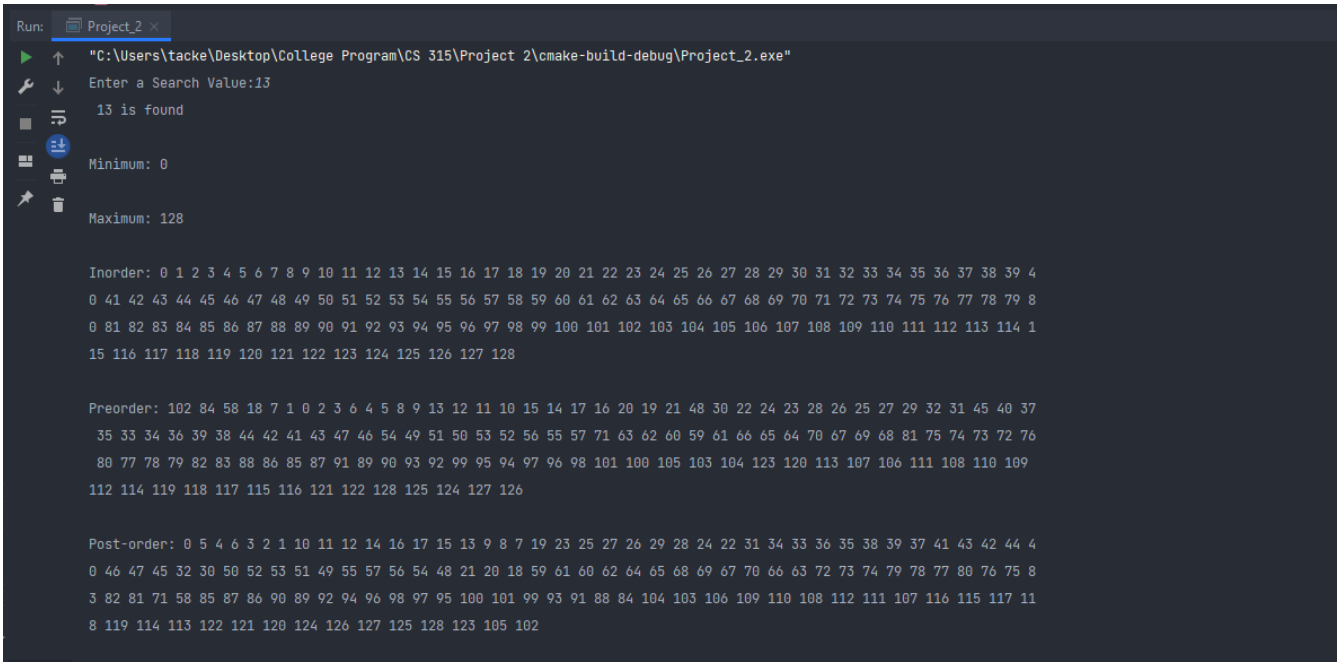
We were given three sets of test data and were tasked with using a Binary Search Tree (BST) to create Insert, Search, Min, Max, Inorder, Pre-order, Post-order Traversal, Heaps, and Heapsort

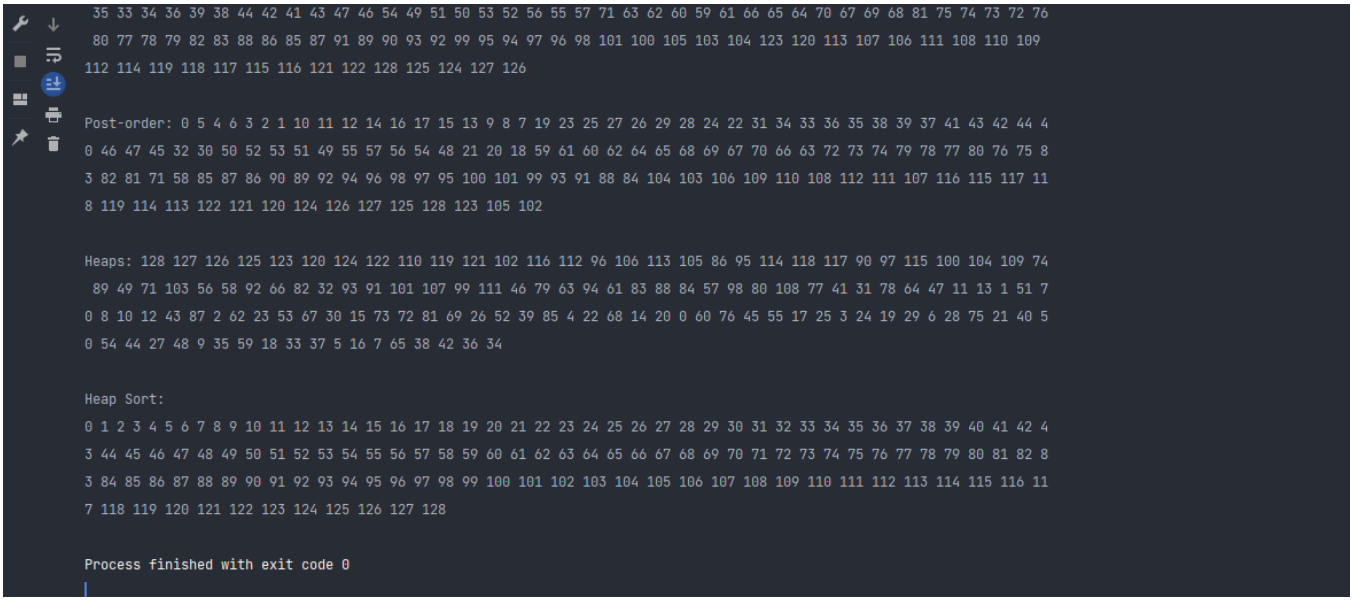
Implementation

To start my code after compiling the program will ask the user to put in a search value, it will do the rest and show the search value if it is found or not found. After that is done it will show the minimum and maximum value of the data. The data is only changeable within the code itself; it won't let the user change the data each time they run the program. After that the program will display the Inorder, Pre-order, and Post-order of the data and the Heap of the data with the heapsort. The data is displayed from the terminal in the form of an array while using the tree variables in the main function.

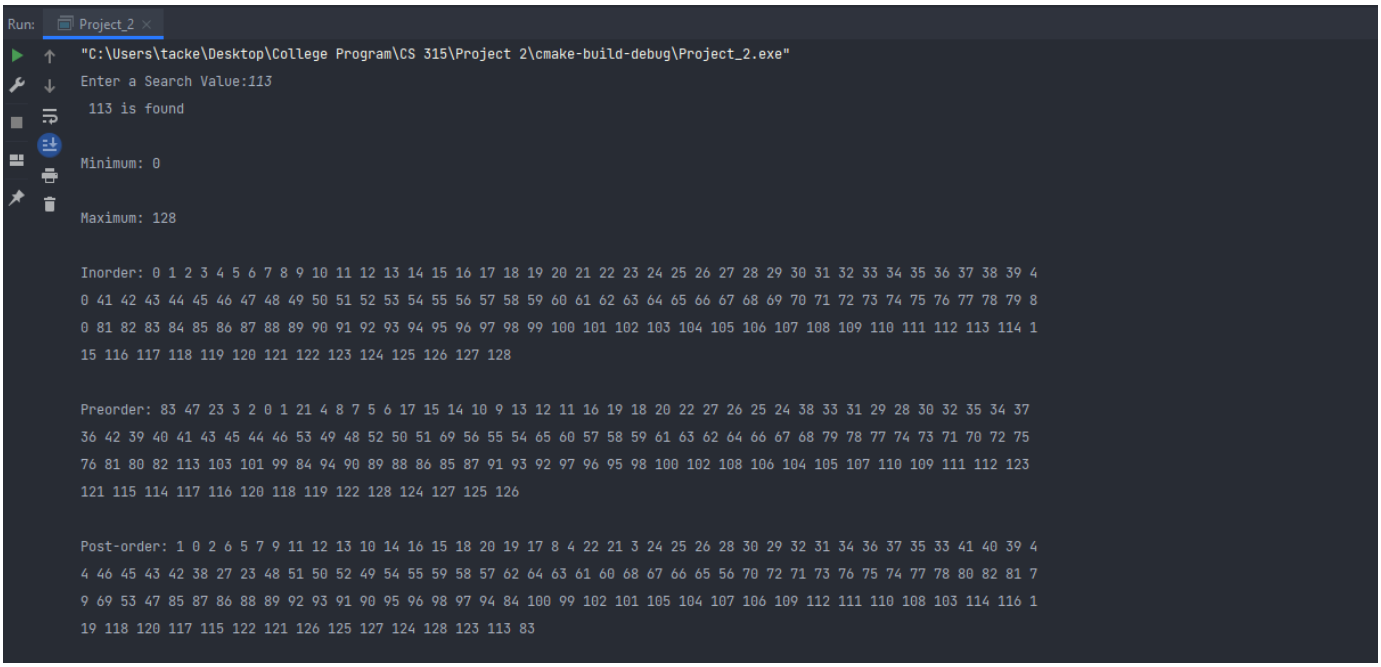
Results

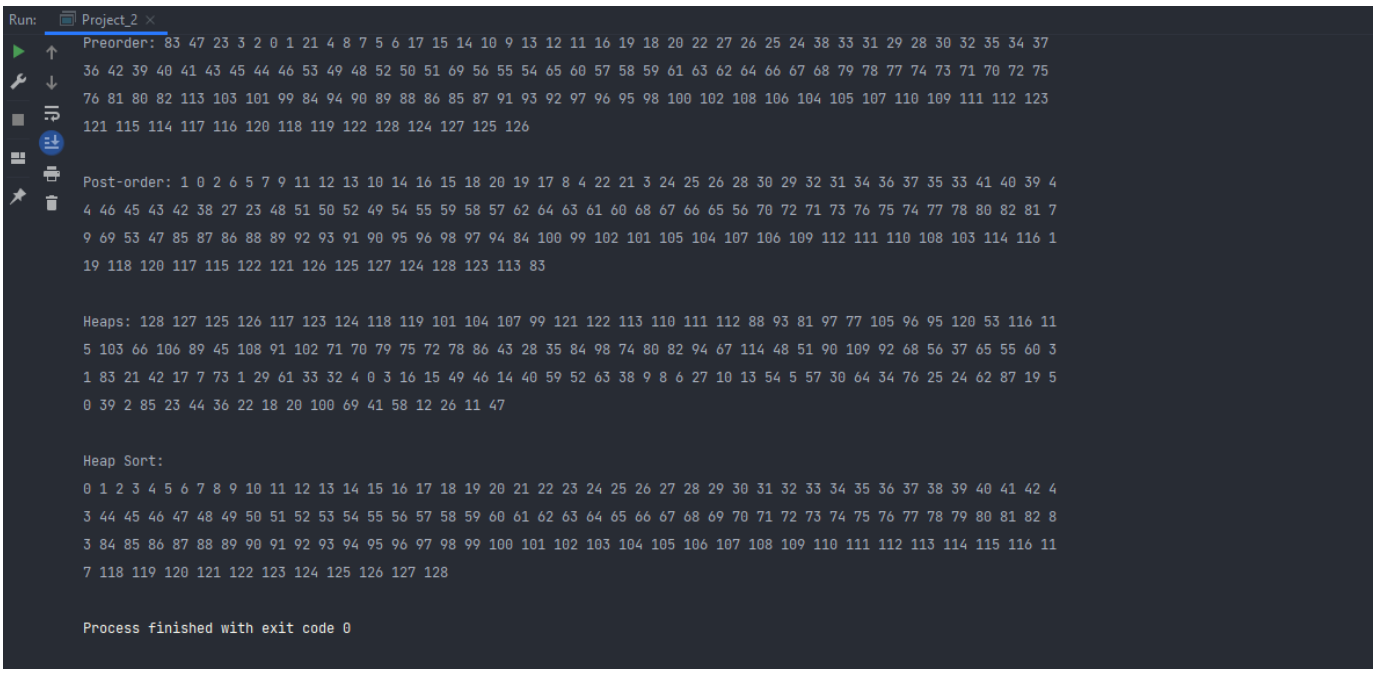
Test 1



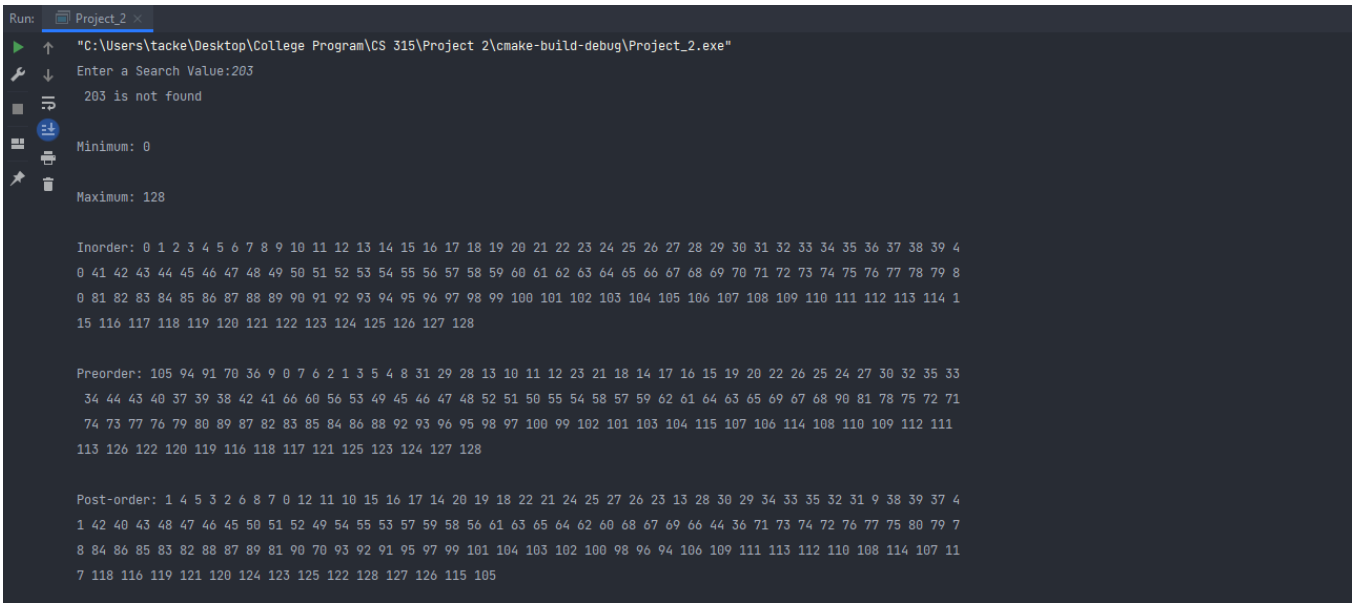


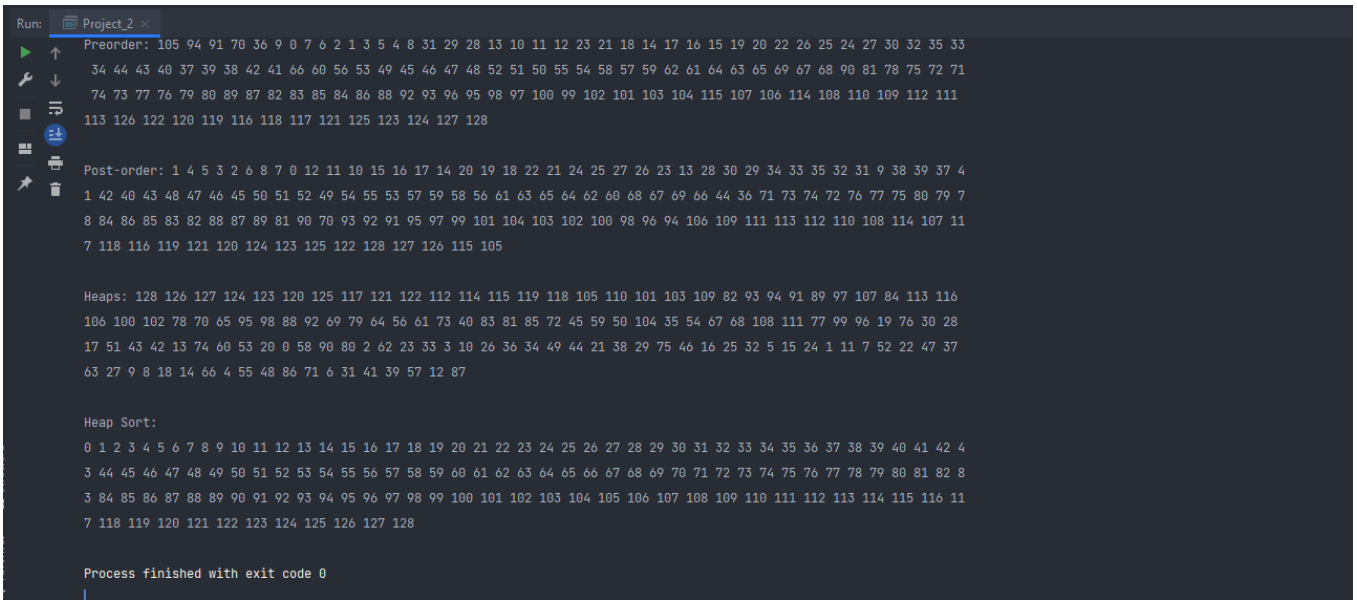
Test 2


Run:
Project_2
"C:\Users\tacke\Desktop\College Program\CS 315\Project 2\cmake-build-debug\Project_2.exe"
Enter a Search Value:113
113 is found
Minimum: 0
Maximum: 128
Inorder: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 4
0 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 8
0 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 1
15 116 117 118 119 120 121 122 123 124 125 126 127 128
Preorder: 83 47 23 3 2 0 1 21 4 8 7 5 6 17 15 14 10 9 13 12 11 16 19 18 20 22 27 26 25 24 38 33 31 29 28 30 32 35 34 37
36 42 39 40 41 43 45 44 46 53 49 48 52 50 51 69 56 55 54 65 60 57 58 59 61 63 62 64 66 67 68 79 78 77 74 73 71 70 72 75
76 81 80 82 113 103 101 99 84 94 90 89 88 86 85 87 91 93 92 97 96 95 98 100 102 108 106 104 105 107 110 109 111 112 123
121 115 114 117 116 120 118 119 122 128 124 127 125 126
Post-order: 1 0 2 6 5 7 9 11 12 13 10 14 16 15 18 20 19 17 8 4 22 21 3 24 25 26 28 30 29 32 31 34 36 37 35 33 41 40 39 4
4 46 45 43 42 38 27 23 48 51 50 52 49 54 55 59 58 57 62 64 63 61 60 68 67 66 65 56 70 72 71 73 76 75 74 77 78 80 82 81 7
9 69 53 47 85 87 86 88 89 92 93 91 90 95 96 98 97 94 84 100 99 102 101 105 104 107 106 109 112 111 110 108 103 114 116 1
19 118 120 117 115 122 121 126 125 127 124 128 123 113 83


Run:
Project_2
Preorder: 83 47 23 3 2 0 1 21 4 8 7 5 6 17 15 14 10 9 13 12 11 16 19 18 20 22 27 26 25 24 38 33 31 29 28 30 32 35 34 37
36 42 39 40 41 43 45 44 46 53 49 48 52 50 51 69 56 55 54 65 60 57 58 59 61 63 62 64 66 67 68 79 78 77 74 73 71 70 72 75
76 81 80 82 113 103 101 99 84 94 90 89 88 86 85 87 91 93 92 97 96 95 98 100 102 108 106 104 105 107 110 109 111 112 123
121 115 114 117 116 120 118 119 122 128 124 127 125 126
Post-order: 1 0 2 6 5 7 9 11 12 13 10 14 16 15 18 20 19 17 8 4 22 21 3 24 25 26 28 30 29 32 31 34 36 37 35 33 41 40 39 4
4 46 45 43 42 38 27 23 48 51 50 52 49 54 55 59 58 57 62 64 63 61 60 68 67 66 65 56 70 72 71 73 76 75 74 77 78 80 82 81 7
9 69 53 47 85 87 86 88 89 92 93 91 90 95 96 98 97 94 84 100 99 102 101 105 104 107 106 109 112 111 110 108 103 114 116 1
19 118 120 117 115 122 121 126 125 127 124 128 123 113 83
Heaps: 128 127 125 126 117 123 124 118 119 101 104 107 99 121 122 113 110 111 112 88 93 81 97 77 105 96 95 120 53 116 11
5 103 66 106 89 45 108 91 102 71 70 79 75 72 78 86 43 28 35 84 98 74 80 82 94 67 114 48 51 90 109 92 68 56 37 65 55 60 3
1 83 21 42 17 7 73 1 29 61 33 32 4 0 3 16 15 49 46 14 40 59 52 63 38 9 8 6 27 10 13 54 5 57 30 64 34 76 25 24 62 87 19 5
0 39 2 85 23 44 36 22 18 20 100 69 41 58 12 26 11 47
Heap Sort:
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 4
3 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 8
3 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 11
7 118 119 120 121 122 123 124 125 126 127 128
Process finished with exit code 0

Test 3


Run:
Project_2
"C:\Users\tacke\Desktop\College Program\CS 315\Project 2\cmake-build-debug\Project_2.exe"
Enter a Search Value:203
203 is not found
Minimum: 0
Maximum: 128
Inorder: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 4
0 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 8
0 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 1
15 116 117 118 119 120 121 122 123 124 125 126 127 128
Preorder: 105 94 91 70 36 9 0 7 6 2 1 3 5 4 8 31 29 28 13 10 11 12 23 21 18 14 17 16 15 19 20 22 26 25 24 27 30 32 35 33
34 44 43 40 37 39 38 42 41 66 60 56 53 49 45 46 47 48 52 51 50 55 54 58 57 59 62 61 64 63 65 69 67 68 90 81 78 75 72 71
74 73 77 76 79 80 89 87 82 83 85 84 86 88 92 93 96 95 98 97 100 99 102 101 103 104 115 107 106 114 108 110 109 112 111
113 126 122 120 119 116 118 117 121 125 123 124 127 128
Post-order: 1 4 5 3 2 6 8 7 0 12 11 10 15 16 17 14 20 19 18 22 21 24 25 27 26 23 13 28 30 29 34 33 35 32 31 9 38 39 37 4
1 42 40 43 48 47 46 45 50 51 52 49 54 55 53 57 59 58 56 61 63 65 64 62 60 68 67 69 66 44 36 71 73 74 72 76 77 75 80 79 7
8 84 86 85 83 82 88 87 89 81 90 70 93 92 91 95 97 99 101 104 103 102 100 98 96 94 106 109 111 113 112 110 108 114 107 11
7 118 116 119 121 120 124 123 125 122 128 127 126 115 105


Run:
Project_2
Preorder: 105 94 91 70 36 9 0 7 6 2 1 3 5 4 8 31 29 28 13 10 11 12 23 21 18 14 17 16 15 19 20 22 26 25 24 27 30 32 35 33
34 44 43 40 37 39 38 42 41 66 60 56 53 49 45 46 47 48 52 51 50 55 54 58 57 59 62 61 64 63 65 69 67 68 90 81 78 75 72 71
74 73 77 76 79 80 89 87 82 83 85 84 86 88 92 93 96 95 98 97 100 99 102 101 103 104 115 107 106 114 108 110 109 112 111
113 126 122 120 119 116 118 117 121 125 123 124 127 128
Post-order: 1 4 5 3 2 6 8 7 0 12 11 10 15 16 17 14 20 19 18 22 21 24 25 27 26 23 13 28 30 29 34 33 35 32 31 9 38 39 37 4
1 42 40 43 48 47 46 45 50 51 52 49 54 55 53 57 59 58 56 61 63 65 64 62 60 68 67 69 66 44 36 71 73 74 72 76 77 75 80 79 7
8 84 86 85 83 82 88 87 89 81 90 70 93 92 91 95 97 99 101 104 103 102 100 98 96 94 106 109 111 113 112 110 108 114 107 11
7 118 116 119 121 120 124 123 125 122 128 127 126 115 105
Heaps: 128 126 127 124 123 120 125 117 121 122 112 114 115 119 118 105 110 101 103 109 82 93 94 91 89 97 107 84 113 116
106 100 102 78 70 65 95 98 88 92 69 79 64 56 61 73 40 83 81 85 72 45 59 50 104 35 54 67 68 108 111 77 99 96 19 76 30 28
17 51 43 42 13 74 60 53 20 0 58 90 80 2 62 23 33 3 10 26 36 34 49 44 21 38 29 75 46 16 25 32 5 15 24 1 11 7 52 22 47 37
63 27 9 8 18 14 66 4 55 48 86 71 6 31 41 39 57 12 87
Heap Sort:
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 4
3 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 8
3 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 11
7 118 119 120 121 122 123 124 125 126 127 128
Process finished with exit code 0