

## Lab W3D2

[1 point] Question 1. Implement Heapsort Top-Down. Write your code in such a way that given an input, your program will return the number of “data item” comparisons.

[1 point] Question 2. Implement Heapsort Bottom-Up. Write your code in such a way that given an input, your program will return the number of “data item” comparisons.

[1 point] Question 3. Implement Heapsort Bottom-Up. Write your code in such a way that given an input, your program will return the number of “data item” comparisons.

[7 points, see the split below] Question 4. Validate your code. Run your code using the following FOUR data sets. Also do it *using paper and pencil*. Make sure your programs are correct and your counting is correct.

[1 point] Data Set 1: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

[2 point] Data Set 2: 2 1 4 3 6 5 8 7 10 9 12 11 14 13 16 15

[2 point] Data Set 3: 4 2 3 1 5 8 7 6 11 10 12 9 13 14 16 15

[2 point] Data Set 4: 5 6 7 4 2 3 1 8 11 13 14 16 10 12 11 9