

Lab 4

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Problem statement

Merge sort is an efficient, general-purpose, and comparison-based sorting algorithm defined as a sorting algorithm that works by dividing an array into smaller subarrays, sorting each subarray, and then merging the sorted subarrays back together to form the final sorted array.

Code flow

1. Input the size of the array
2. Input the elements of the array
3. Create the first major thread and call merge_sort
4. If low < high continue logic else return from thread
5. calculate middle of the array
6. create two threads for each half of the array
7. call merge_sort for each
8. repeat until one thread per element
9. merge each of the threads in reverse order of calls
10. Print the sorted array

Sample Runs

```
→ Labs git:(main) ✖ ./a.out
Input size of array:
10
83 13 93 0 -12 32 4 82 2 1
=====
Sorted Array:
-12 0 1 2 4 13 32 82 83 93
→ Labs git:(main) ✖ ./a.out
Input size of array:
5
8 7 3 2 1
=====
Sorted Array:
1 2 3 7 8
→ Labs git:(main) ✖ ./a.out
Input size of array:
20
9 8 7 6 5 4 3 2 1 10 29 83 74 5 7 83 14 -2 -1 -100
=====
Sorted Array:
-100 -2 -1 1 2 3 4 5 5 6 7 7 8 9 10 14 29 74 83 83
→ Labs git:(main) ✖
```