Algorithms and Data Structures

Module 2

Assignment 3

Merge sort

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Task

Develop a program that sorts the given array of integer values with the MergeSort algorithm.

Input: array of integer numbers separated with spaces.

It is possible to use random numbers generator to generate an input array. In this case user inputs the array length.

Output: array of the input values sorted in ascending order.

The complete implementation of this assignment gives you 8 pts.

Hints

In order to debug the program, it is recommended to use a helper function for printing array items.

Sample code:

```
void print_vector(std::vector<ads_item> & vect)
{
    for (std::vector<ads_item>::iterator it = vect.begin(); it != vect.end(); ++it)
    {
        std::cout << *it << " ";
    }
    std::cout << "\n";
}
```

How to use:

```
// Run MergeSort
ads_item::reset();
print_vector(v_merge); // print the array before sorting
merge_sort(v_merge);
print_vector(v_merge); // print the array after sorting
```

Hints

Standard random numbers generator generates long integers. Checking correctness of sorting for such long integers is rather difficult. To make it easy, it is useful to modify `ads_item` constructor to make it generate short integers (say, from 0 to 99):

```
// Constructor. Initialize items with random values.
ads_item()
{
    data = rand() % 100;
};
```