EXPERIENT 1.4

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BRANCH: BE_CSE	SEMESTER: 3RD
SECTION: 13_A	SUBJECT: DATA STRUCTURE LAB

Question 2

Write a program to sort an array of floating-point numbers in descending order using the merge sorting?

SOLUTION

ALGORITHM

1. Declare an array of some fixed capacity.
2. Iterating through for loops (from [0 to N)), take integers as input from user and print them. These input are the elements of the array.
3. Now, create a nested for loop with i and j as iterators.
4. Start the sorting in descending order by extracting each element at position i of outer loop.
5. This element is being compared to every element from position i+1 to size-1 (means all elements present below this extracted element)
6. In case any the extracted element is smaller than the element below it, then these two interchange their position, else the loop continues.
7. After this nested loop gets executed, we get all the elements of the array sorted in descending order.

PROGRAM CODE

```cpp
#include <iostream>
using namespace std;
int partition(float a[], int low, int high)
{
 float pivoted_e = a[low];
 int left, right;
 left = low;
 right = high;
 while (left < right)
 {
 while (a[left] <= pivoted_e)
 left++;
 while (a[right] > pivoted_e)
 right--;
 if (left < right)
 {
 float temp = a[left];
 a[left] = a[right];
 a[right] = temp;
 }
 }
 a[low] = a[right];
 a[right] = pivoted_e;
 return right;
}
void mergSort(float arr[], int low, int high)
{
 int pivot;
 if (low < high)
 {
 pivot = partition(arr, low, high);
 mergSort(arr, low, pivot - 1);
 mergSort(arr, pivot + 1, high);
 }
}
void printArray(float arr[], int size)
```

```cpp
{
    int i;
    for (i = 0; i < size; i++)
    {
        cout << arr[i] << " ";
    }
    cout << endl;
}
int main()
{
    float arr[] = {70.44, 85.64, 66.33, 92.23, 33.56};
    int n = sizeof(arr) / sizeof(arr[0]);
    mergSort(arr, 0, n - 1);
    cout << "The sorted array in descending order is: ";
    for (int i = 0; i <= n / 2; i++)
    {
        float temp = arr[i];
        arr[i] = arr[n - i - 1];
        arr[n - i - 1] = temp;
    }
    printArray(arr, n);
    return 0;
}
```

OUTPUT

```
PROBLEMS    OUTPUT    TERMINAL                                          1: Code

cd "/Users/rajdeepjaiswal/rj/" && g++ rj.cpp -o rj && "/Users/rajdeepjaiswal/rj/"rj
rajdeepjaiswal@Rajdeeps-Air rj % cd "/Users/rajdeepjaiswal/rj/" && g++ rj.cpp -o rj && "/Users/rajdeepjaiswal/r
/"rj
The sorted array in descending order is: 92.23 85.64 70.44 66.33 33.56
rajdeepjaiswal@Rajdeeps-Air rj % ▯
```