/Merge Sort /

Code :-

#include <bits/stdc++.h>

using namespace std;

void merge(int arr[], int left, int mid, int right)

{

    int i, j, k, n1 = mid - left + 1, n2 = right - mid;

    int L[n1], R[n2];

    for (i = 0; i < n1; i++)

        L[i] = arr[left + i];

    for (j = 0; j < n2; j++)

        R[j] = arr[mid + 1 + j];

    i = 0;

    j = 0;

    k = left;

    while (i < n1 && j < n2)

    {

        if (L[i] <= R[j])

        {

            arr[k] = L[i];

            i++;

        }

        else

        {

            arr[k] = R[j];

            j++;

        }

        k++;

    }

    while (i < n1)

    {

        arr[k] = L[i];

        i++;

        k++;

    }

    while (j < n2)

    {

        arr[k] = R[j];

        j++;

        k++;

    }

}

void mergeSort(int arr[], int left, int right)

{

    if (left < right)

    {

        int mid = (left + right) / 2;

        mergeSort(arr, left, mid);

        mergeSort(arr, mid + 1, right);

        merge(arr, left, mid, right);

    }

}

int main()

{

    while (1)

    {

        int n;

        cout << "Enter the size :- ";

        cin >> n;

        clock\_t start, end;

        start = clock();

        int arr[n];

        srand(time(NULL));

        for (int i = 0; i < n; i++)

            arr[i] = rand();

        mergeSort(arr, 0, n-1);

        end = clock();

        cout << "Time taken for shorting = " << (end - start) << endl;

    }

    return 0;

}

Output :-

PS C:\Users\ASUS\Desktop\sorting\_codes> cd "c:\Users\ASUS\Desktop\sorting\_codes\Merge\_sort\" ; if ($?) { g++ mergeSort.cpp -o mergeSort } ; if ($?) { .\mergeSort }

Enter the size :- 1000

Time taken for shorting = 0

Enter the size :- 2000

Time taken for shorting = 0

Enter the size :- 3000

Time taken for shorting = 1

Enter the size :- 4000

Time taken for shorting = 1

Enter the size :- 5000

Time taken for shorting = 2

Enter the size :- 6000

Time taken for shorting = 1

Enter the size :- 7000

Time taken for shorting = 1

Enter the size :- 8000

Time taken for shorting = 1

Enter the size :- 9000

Time taken for shorting = 1

Enter the size :- 10000

Time taken for shorting = 1

Enter the size :- 11000

Time taken for shorting = 3

Enter the size :- 12000

Time taken for shorting = 1