```c
// Online C compiler to run C program online
#include <stdio.h>
#include<stdlib.h>
#include<time.h>
int *a,*b;


void merge(int a[], int low, int mid, int high)
{
    int i = low, j = mid + 1, k = low;
    while (i <= mid && j <= high)
    {
        if (a[i] < a[j])
        {
            b[k] = a[i];
            i++;
        }
        else
        {
            b[k] = a[j];
            j++;
        }
        k++;
    }

    while (j <= high)
    {
        b[k] = a[j];
        j++;
        k++;
    }

    while (i <= mid)
    {
        b[k] = a[i];
        i++;
        k++;
    }

    for (int i = low; i <= high; i++)
    {
        a[i] = b[i];
    }
}

void merge_sort(int a[],int low,int high)
{
    if(low<high)
    {   int mid=(low+high)/2;
        merge_sort(a,low,mid);
        merge_sort(a,mid+1,high);
        merge(a,low,mid,high);
    }
}
```

```
void calc(int a[], int low, int high)
{
    clock_t start = clock();
    merge_sort(a, low, high);
    clock_t end = clock();
    double Totime = ((double)(end - start)) / CLOCKS_PER_SEC;
    printf("%f\t", Totime);
}


int main() {
    printf("n\tascending\trandomn\tdescending\n");

    int n = 10000, j = 1;
    while (j < 5) {
        a = (int *)malloc(n * sizeof(int));
        b = (int *)malloc(n * sizeof(int));
        printf("%d\t", n);

        for (int i = 0; i < n; i++) {
            a[i] = i;
        }
        calc(a, 0, n - 1);


       srand(time(NULL));
       for (int i = 0; i < n; i++) {
            a[i] = rand();
        }
        calc(a, 0, n - 1);

        for (int i = 0, k = n; i < n; i++) {
            a[i] = k;
            k--;
        }
        calc(a, 0, n - 1);

        printf("\n");

        free(a);
        free(b);

        n = n * 2;
        j++;
    }

    return 0;
}
```

o/p:

```
n         ascending    randomn     descending

10000 0.000633    0.001239    0.000571
```

```
20000 0.001286    0.002539    0.001208

40000 0.002700    0.005397    0.002538

80000 0.005647    0.011319    0.005492
```