



KIET Group of Institutions, Ghaziabad

Department of Computer Applications

(An ISO – 9001: 2015 Certified & 'A' Grade accredited Institution by NAAC)

Design and Analysis of Algorithm

RCA 352: Session 2020-21

DAA Lab

Experiment-No.

Objective: Implement the **Improved Bubble Sort** algorithm to sort the given list of N numbers and plot graph

| | | |
|-----------------|----------------|-----------------|
| Scheduled Date: | Compiled Date: | Submitted Date: |
| 29/09/20 | 29/09/20 | 30/09/20 |

Algorithm:

IMPROVED BUBBLE SORT (Input: Array A, Size N)

N: Number of values to be sort

A: Array of Size N

Temp, Pass, j, flag

1. Pass=1
2. while(pass<=n)
3. j=1
4. flag=0
5. while(j<=n-pass)
6. if(a[j]>a[j+1])
7. temp=a[j];
8. a[j]=a[j+1];
9. a[j+1]=temp
10. flag=1
11. j = j+1
12. end while
13. if(flag==0)
14. break
15. pass = pass+1
16. end while

```
Program file improvised bubble sort .c
#include<stdio.h>
#include<process.h>
#include<conio.h>
#include<alloc.h>
int count=0;
void main()
{
    void getdata(int[20],int);
    void putdata(int[20],int);
    void bubble_sort(int[20],int);
    int i,a[100],n;
    clrscr();
    printf("enter the value of n\n");
    scanf("%d",&n);
```



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```
getdata(a,n);
printf(" before sorting\n");
putdata(a,n);
bubble_sort(a,n);
printf("\nafter sorting\n");
putdata(a,n);
printf("\n for n = %d value of count is %d",n,count);
getch();
}
void getdata(int x[20],int n)
{
    int k;
    printf("enter the value for sorting\n");
    for(k=0;k<n;k++)
    {
        scanf("%d",&x[k]);
    }
}
void putdata(int x[20],int n)
{
    int k;
    for(k=0;k<n;k++)
    {
        printf("%d\t",x[k]);
    }
    printf("\n");
}
void bubble_sort(int a[],int n)
{
    int pass,j,temp;
    count++;
    int flag=1;
    for(pass=1;pass<=n-1 && flag;pass++)
    {
        count++;
        count++;
        flag=0;
        for(j=0;j<n-pass;j++)
        {
            count++;
            count++;
            if(a[j]>a[j+1])
            {
                count++;
                temp=a[j];
                count++;
                a[j]=a[j+1];
                count++;
                a[j+1]=temp;
            }
        }
    }
}
```



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```
    flag=1;
  }
  count++;
  }
  count++;
  }
}
```

Output

| Input Size | Best Case | Average Case | Worst Case |
|------------|-----------|--------------|------------|
| 5 | 43 | 52 | 74 |
| 10 | 53 | 226 | 298 |
| 15 | 64 | 430 | 673 |
| 20 | 73 | 748 | 1198 |
| 25 | 83 | 1099 | 1873 |

Graph

