

## QUICK SORT PROGRAM

PROGRAM:-

```

#include<stdio.h>
#include<stdlib.h>
#include<time.h>
clock_t start1,end1;
int a[10],n;

void q_sort(int [ ],int,int);
int partition(int [ ], int, int);

int main()
{
    int i;
    srand(time(0));
    printf("Enter the size of array\n");
    scanf("%d",&n);
    start1=clock();
    for(i=0; i<n; i++){
        a[i]=rand()%100;
        printf("%d\t",a[i]);
    }
    printf("\n");
    q_sort(a, 0, n-1);
    for (int c = 1; c <= 8000; c++) for (int d = 1; d <= 8000; d++) { }
    end1=clock();
    printf("Sorted array\n");
    for(i=0;i<n;i++){
        printf("%d\t",a[i]);
    }
    printf("\n");
    double cpu_time1 = (double) (end1-start1)/CLOCKS_PER_SEC;

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    printf("Time taken: %f",cpu_time1);
    return 0;
}

void q_sort(int a[ ], int low, int high)
{
    int mid;
    if(low<high)
    {
        mid=partition(a,low,high);
        q_sort(a,low,mid-1);
        q_sort(a,mid+1,high);
    }
}

int partition(int a[ ], int low, int high)
{
    int i, j, temp, pivot;
    pivot=a[low];
    i=low+1;
    j=high;
    while(i<=j)
    {
        while(a[i]<=pivot)
            i++;
        while(a[j]>pivot)
            j--;
        if(i<j)
        {
            temp=a[i];
            a[i]=a[j];
            a[j]=temp;
        }
    }
    return i;
}

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        a[j]=temp;
    }
}
temp=a[low];
a[low]=a[j];
a[j]=temp;
return j;
}

```

OUTPUT:-

```

Enter the size of array
50
78    39    60    27    8    54    99    96    14    19    0    12    15    43    83    49    6    52
    2    87    10    22    77    11    86    74    1    46    63    69    79    41    60    92    21
69    46    72    17    12    92    70    24    59    13    60    61    71    64    63
Sorted array
0    1    2    6    8    10    11    12    12    13    138400  0    17    19    21    22    24    27
    39    41    43    46    46    49    52    54    59    60    60    60    61    63    63    64    69
69    70    71    72    74    77    78    79    83    86    87    92    92    96    99
Time taken: 0.137639

...Program finished with exit code 0
Press ENTER to exit console.

```