# LAB REPORT

DSA Lab: 5

# INSERTION SORT

INPUT: 5 Randomly Generated numbers using arrays.

```
#include<random>
#include<cstdlib>
#include<time.h>
using namespace std;
int main()
{
    int n, j, temp;
    cout<<"\nElements of randomly generated array :\n";
    srand(time(0));
    n=5;
    int arr[n];
    for (int i = 0; i < n; i++)
    {
        arr[i] = rand();
    }
```

OUTPUT: Sorted arrays using Insertion Sort

Example: 1

```
Elements of randomly generated array :
227 28247 28271 2367 18996
Sorted: 227 505 2367 18996 28247
```

Example: 2

```
Elements of randomly generated array :
306 24065 31027 22831 4402
Sorted: 306 356 4402 22831 24065
```

# GRAPH SHOWING THE EXECUTION TIME

It can be seen that the time taken exponentially increases when the number of data is increased for insertion sort.

The time complexity of insertion sort is: $O(N^2)$