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Roll No:-234

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input	linear Search	Binary Se	Elemen
1	428	61	89383
2	368	116	30886
3	238	61	92777
4	189	62	36915
5	284	71	47793
6	308	70	38335
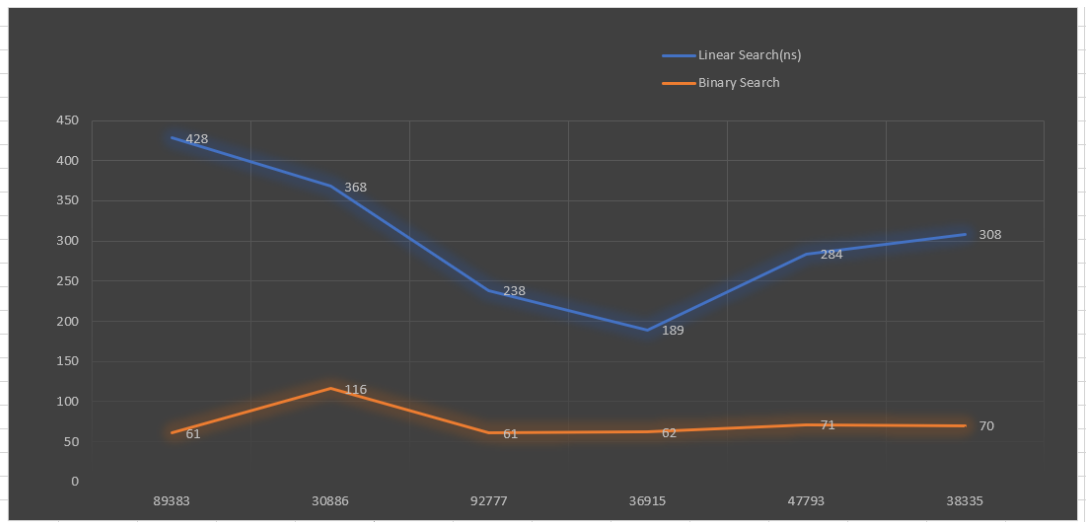
Code:

```cpp
#include<iostream>

#include <bits/stdc++.h>

#include <algorithm>

#include <chrono>

//#include<vector>

using namespace std;

using namespace std::chrono;




int linearSearch(int a[], int n, int val){

        for(int i=0; i<n ; i++){

                if(a[i]==val){

                        return i;

                }

        }

        return -1;

}


int binarySearch(int a[], int val, int start, int end){

        while( start <= end){


                int mid = start + ((end - start)/2);
```

```cpp
            if(a[mid]==val){
                    return mid;
            }
            if(a[mid] < val){
                    start = mid+1;
            }
            else{
                    end = mid-1;
            }
        }
        return -1;
}


int main(){

        int n,val;
        cout<<"\nEnter no. of elements(n) : ";
        cin>>n;
        int a[n];
        for(int i=0; i<n ; i++){
                a[i] = rand()%100000;
        }

        sort(a, a + n);
        cout<<"\n Sorted Array Elements : ";
        for(int j=0; j<n ; j++){
                cout<<" "<<a[j];
        }

        int s=1;
        while(s!=0){
                cout<<"\nEnter the value for search :";
                cin>>val;

                //
```

```cpp
        cout<<"\n------<< Linear Search >>------"<<endl;
auto start = high_resolution_clock::now();


        int index = linearSearch(a,n,val);


        auto stop = high_resolution_clock::now();
        auto duration = duration_cast<nanoseconds>(stop - start);
        cout << "\nTime taken by function: "<< duration.count() << " nanoseconds";


if(index==-1){
                cout<<"\nValue not found";
        }else{
                cout<<"\nNumber "<<val<<" is present at position "<<index+1;
        }




        //




        cout<<"\n\n------<< Binary Search >>------"<<endl;


         start = high_resolution_clock::now();


        int index1 = binarySearch(a , val, 0, n-1);


         stop = high_resolution_clock::now();
         duration = duration_cast<nanoseconds>(stop - start);
        cout << "\nTime taken by function: "<< duration.count() << " nanoseconds";


        if(index1==-1){
                cout<<"\nValue not found";
        }else{
                cout<<"\nNumber "<<val<<" is present at position "<<index+1;
        }
```

```
            //
            cout<<"\nTo search again press 1 / to exit press 0 : ";

            cin>>s;

            if(s==0){

                    break;

            }

     }


     return 0;

}
```

//Output:

```
Enter no. of elements(n) : 10

 Sorted Array Elements :   16649 30886 36915 38335 41421 47793 60492 85386 89383 92777
Enter the value for search :60492

------<< Linear Search >>------

Time taken by function: 397 nanoseconds
Number 60492 is present at position 7

------<< Binary Search >>------

Time taken by function: 142 nanoseconds
Number 60492 is present at position 7
To search again press 1 / to exit press 0 : []
```