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ADMISSION NO – U21CS040
ASSIGNMENT 1

Q1 Linear Search

```
#include <stdio.h>
#include<stdlib.h>
#include<time.h>
```

```
int linear(int key){
    FILE *ptr = NULL;
    ptr = fopen("File 10.txt", "r");

    char str[15];
    int flag = 0;

    while(fgets(str,10,ptr) != NULL){
        int n = atoi(str);

        if(n==key){
            flag = 1;
            break;
        }
    }

    fclose(ptr);

    return flag;
}
```

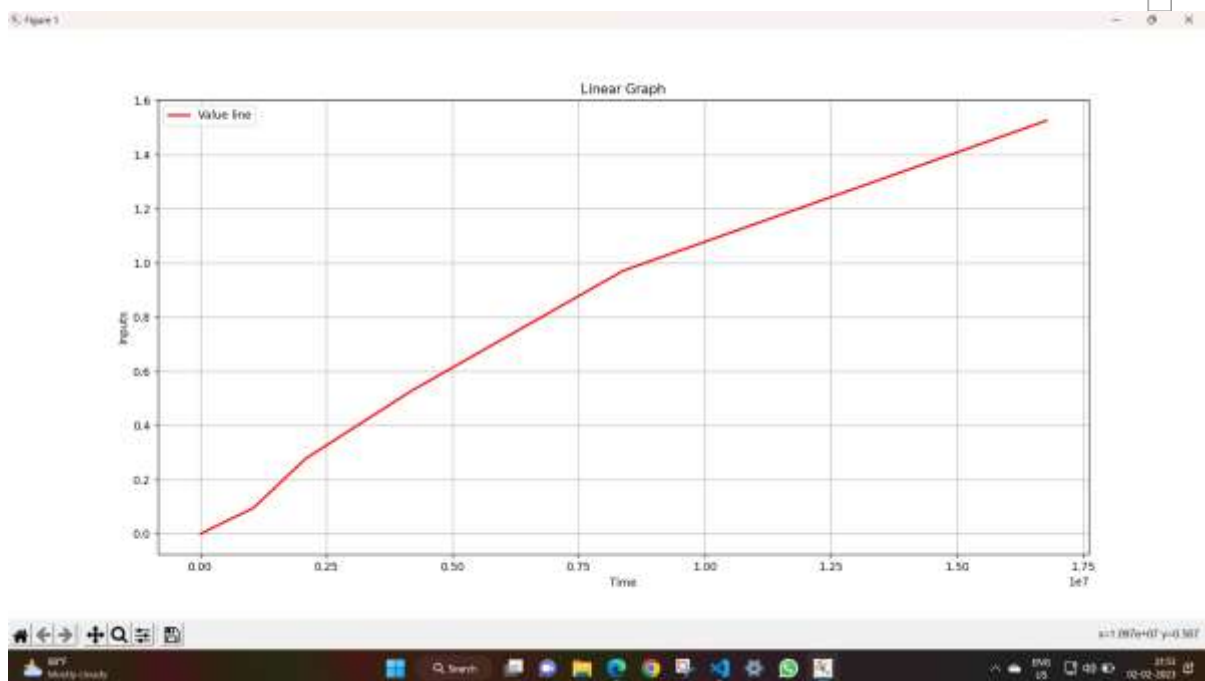
```
int main()
{
    int key;
    printf("Enter key value : ");
    scanf("%d", &key);

    clock_t t;
    t = clock();
    int n = linear(key);
    t = clock() - t;
    double time = ((double)t)/CLOCKS_PER_SEC;

    printf("The time taken for the execution is
%f", time);

    return 0;
}
```

No. of Inputs	Linear Search Best Case (Sec.)	Linear Search Worst Case (Sec.)
1024	0.000	0.000
4096	0.000	0.0005
16384	0.000	0.001
65536	0.000	0.005
262144	0.000	0.024
1048576	0.000	0.095
2097153	0.000	0.279
4194304	0.000	0.529
8388608	0.000	0.972
16777216	0.000	1.526



Q2 Bubble Sort

```
#include<bits/stdc++.h>
using namespace std;
```

```
void sort(vector<int> &arr){  
    int temp;  
    for(int i=0;i<arr.size()-1;i++){  
        for(int j=0;j<arr.size()-i-1;j++){  
            if(arr[j]>arr[j+1]){  
                temp = arr[j+1];  
                arr[j+1] = arr[j];  
                arr[j] = temp;  
            }  
        }  
    }  
}
```

```

    }
    }
}

```

```

int main(){

    FILE *ptr;
    char str[8];
    ptr = fopen("File 1.txt", "r");
    vector<int> arr;

    while(fgets(str, 8, ptr) != NULL){
        int n = atoi(str);
        arr.push_back(n);
    }
    fclose(ptr);

    sort(arr.begin(), arr.end());
    // reverse(arr.begin(), arr.end());

    clock_t t;
    t = clock();
    sort(arr);
    t = clock() - t;
    double time_taken =
((double)t)/CLOCKS_PER_SEC;

    cout<<time_taken;
}

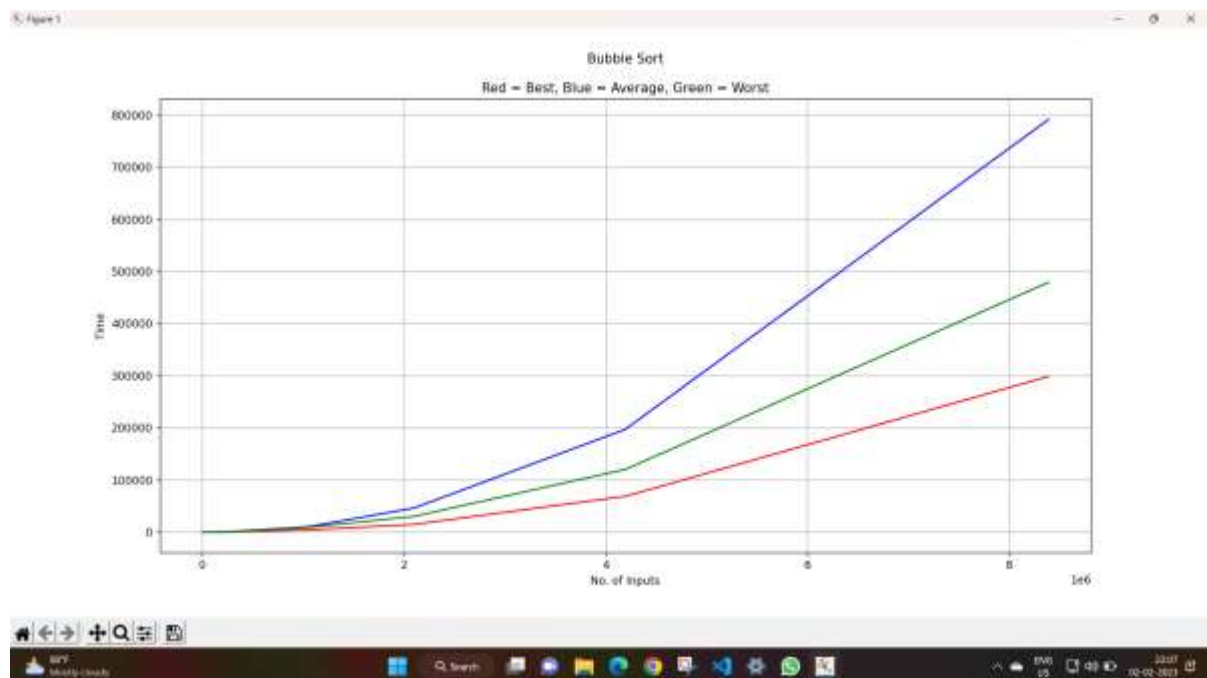
```

```

    return 0;
}

```

No. of Inputs	Bubble Sort Average Case (Sec.)	Bubble Sort Worst Case (Sec.)	Bubble Sort Best Case (Sec.)
1024	0.006	0.007	0.003
4096	0.098	0.094	0.024
16384	1.606	1.788	0.875
65536	27.256	27.124	12.584
262144	519.237	412	256.42
1048576	10024	8745	3987
2097153	45879	27989	14567
4194304	147008	120108	68524
8388608	691071	478895	289400
16777216	1110030	1560800	1050900



Q3 Selection Sort

```

#include<bits/stdc++.h>
using namespace std;

```

```

void sort(vector<int> &arr){

```

```
for(int i=0;i<arr.size()-1;i++){  
    for(int j=i+1;j<arr.size();j++){  
        if(arr[j]<arr[i]){  
            int temp = arr[i];  
            arr[i] = arr[j];  
            arr[j] = temp;  
        }  
    }  
}  
}
```

```
int main(){

    FILE *ptr;
    char str[8];
    ptr = fopen("File 3.txt", "r");
    vector<int> arr;

    while(fgets(str, 8, ptr) != NULL){
        int n = atoi(str);
        arr.push_back(n);
    }
    fclose(ptr);

    sort(arr.begin(), arr.end());
    reverse(arr.begin(), arr.end());

    clock_t t;
    t = clock();
    sort(arr);
    t = clock() - t;
    double time_taken =
((double)t)/CLOCKS_PER_SEC;

    cout<<time_taken;
```



```

    return 0;
}

```

