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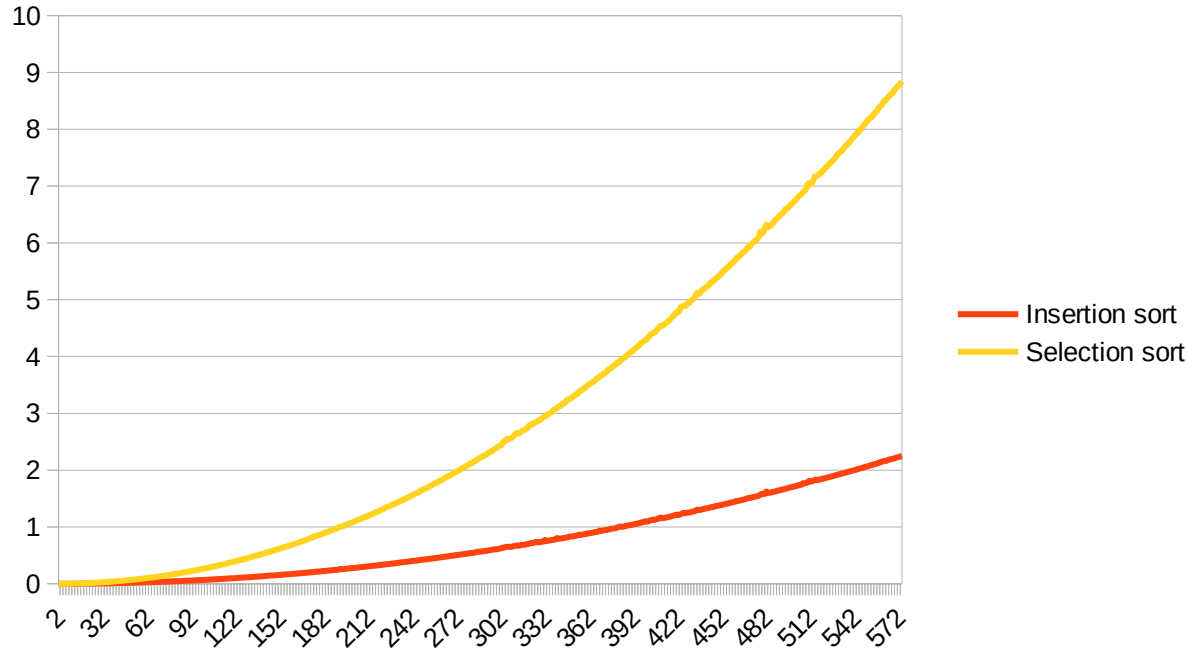
BATCH	C
SUBJECT	DAA
EXPERIMENT NO :	1B
DATE OF PERFORMANCE	06-02-2023
DATE OF SUBMISSION	13-02-2023
AIM:	To find the running time of insertion sort and selection sort.
ALGORITHM	Insertion sort – 1. Access text file from data. 2. For i=0 to n : 3. key=arr[i]; 4. while j>=0 and arr[j]>key : arr[j+1]=arr[j] and j=j-1. 5. arr[j+1]=key. 6. Repeat steps 2 to 5 until i reaches n. Selection sort – 1. Access text file from data. 2. For i=0 to n-1 and for j=i to n-1 3. If arr[j]<arr[i] and arr[j]<arr[mini] then mini=j. 4. Swap arr[mini] and arr[i]. 5. Repeat steps 3 and 4.
PROGRAM	#include<stdio.h> #include<stdlib.h> #include<time.h> void insertionsort(int n)

```
{
        int i,key,j;
        FILE *fp;
        fp=fopen("daaexp1bdata.txt","r");
        int arr[n],arrsort[n];
        for(i=0;i<n;i++)
        {
                fscanf(fp,"%d",&arr[i]);
        }
        for(i=1;i<n;i++)
   {
      key=arr[i];
      j=i-1;
      while(j>=0&&arr[j]>key)
      {
         arr[j+1]=arr[j];
         j=j-1;
      }
      arr[j+1]=key;
   }
        fclose(fp);
}
void selectionsort(int n)
{
        int i,j;
        FILE *fp;
        fp=fopen("daaexp1bdata.txt","r");
        int arr[n];
        for(int i=0;i<n;i++)
        {
                fscanf(fp,"%d",&arr[i]);
        }
        for(i=0;i<n;i++)
        {
                int temp,mini=i;
```

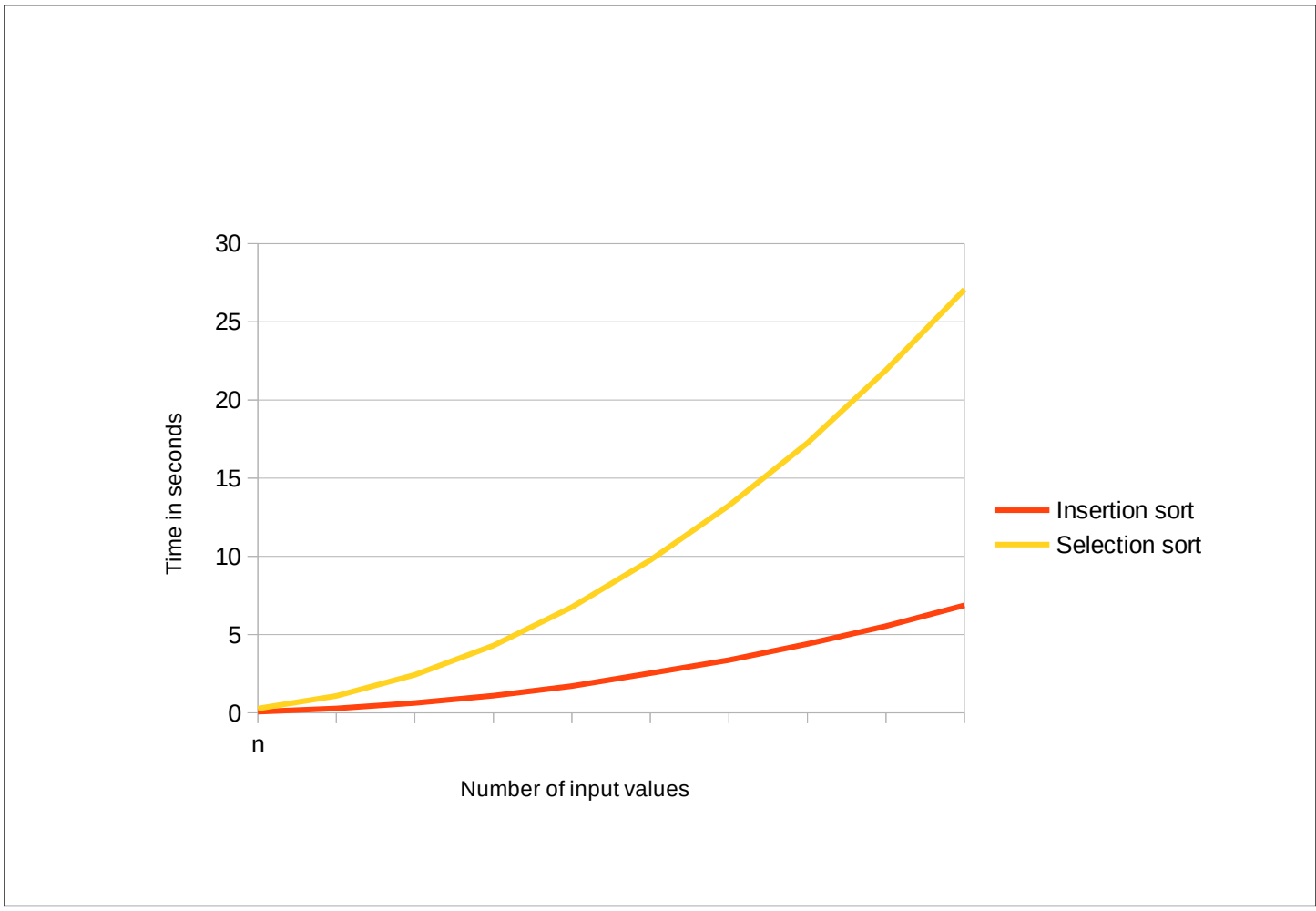
```
                for(j=i;j<n;j++)
                {
                        if(arr[j]<arr[i]&&arr[j]<arr[mini])
                        mini=j;
                }
                temp=arr[mini];
                arr[mini]=arr[i];
                arr[i]=temp;
        }
        fclose(fp);
}
void main()
{
        int i;
        clock_t start,end;
        FILE *fp;
        fp=fopen("daaexp1bdata.txt","w");
        for(int i=0;i<100000;i++)
        {
                int num=(rand()%100000);
                fprintf(fp," %d",num);
        }
        fclose(fp);
        FILE *fp2;
        fp2=fopen("daaexp1bexcel.xlsx","w");
        for(i=100;i<=100000;i=i+100)
        {
                start=clock();
                insertionsort(i);
                end=clock();
                fprintf(fp2," %lf",(double)(end-start)/CLOCKS_PER_SEC);
                start=clock();
                selectionsort(i);
                end=clock();
                fprintf(fp2," %lf",(double)(end-start)/CLOCKS_PER_SEC);
```

```
            fprintf(fp2,"\n");
        }
        fclose(fp2);
}
```

RESULT (SNAPSHOT):



n	Insertion sort	Selection sort
10000	0.07	0.27
20000	0.27	1.08
30000	0.63	2.43
40000	1.09	4.3
50000	1.71	6.76
60000	2.53	9.76
70000	3.37	13.25
80000	4.4	17.25
90000	5.54	21.91
100000	6.87	27.07



CONCLUSION :

With the help of this experiment, I was able to understand and implement insertion sort and selection sort. I was able to differentiate between the runtimes of bot the algorithms for different number of input values.