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**Write a C program to analyse the time complexity of selection sort algorithm.
Also plot their graph for all cases.**

```
#include <stdio.h>

#include <stdlib.h>

#include <time.h>

void swap(int *xp, int *yp)

{

    int temp = *xp;

    *xp = *yp;

    *yp = temp;

}

double selectionSort(int arr[], int n)

{

    clock_t start, end;

    start = clock();

    int i, j, min_idx;

    for (i = 0; i < n - 1; i++)

    {

        min_idx = i;

        for (j = i + 1; j < n; j++)

            if (arr[j] < arr[min_idx])

                min_idx = j;

        if (min_idx != i)

            swap(&arr[min_idx], &arr[i]);

    }

    end = clock();

    return ((double)(end - start)) / CLOCKS_PER_SEC;
```



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```
}  
  
int main()  
{  
    int n;  
    FILE *fptr;  
    fptr = fopen("selection.txt", "w");  
    for (n = 0; n < 100000; n = n + 5000)  
    {  
        int A[n], i;  
        for (i = 0; i < n; i++)  
            A[i] = rand();  
        double d1 = selectionSort(A, n);  
        for (i = 0; i < n; i++)  
            A[i] = i;  
        double d2 = selectionSort(A, n);  
        fprintf(fptr, "%d %lf %lf\n", n, d1, d2);  
    }  
    fclose(fptr);  
    return 0  
}
```

TEXT FILE (selection.txt) :

```
0 0.000007 0.000001  
5000 0.040691 0.026581  
10000 0.104358 0.103927  
15000 0.233600 0.236905  
20000 0.416274 0.411944  
25000 0.645670 0.642938  
30000 0.953098 0.925481
```



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35000 1.262109 1.273640
40000 1.650577 1.646649
45000 2.094677 2.088151
50000 2.580626 2.589480
55000 3.116412 3.114361
60000 3.709667 3.701208
65000 4.346125 4.341761
70000 5.033568 5.021550
75000 5.778087 5.783844
80000 6.582696 6.583259
85000 7.441282 7.431184
90000 8.357384 8.401841
95000 9.304126 9.266627

selection.p FILE :

```
set autoscale # scale axes automatically
unset log # remove any log-scaling
unset label # remove any previous labels
set xtic auto # set xtics automatically
set ytic auto # set ytics automatically
set tics font "Helvetica,10"
set title "Selection sort time complexity"
set xlabel "Input size"
set ylabel "Time taken"
#set key 0.01,100
#set label "Yield Point" at 0.003,260
#set arrow from 0.0028,250 to 0.003,280
set xr [0:100000]
```



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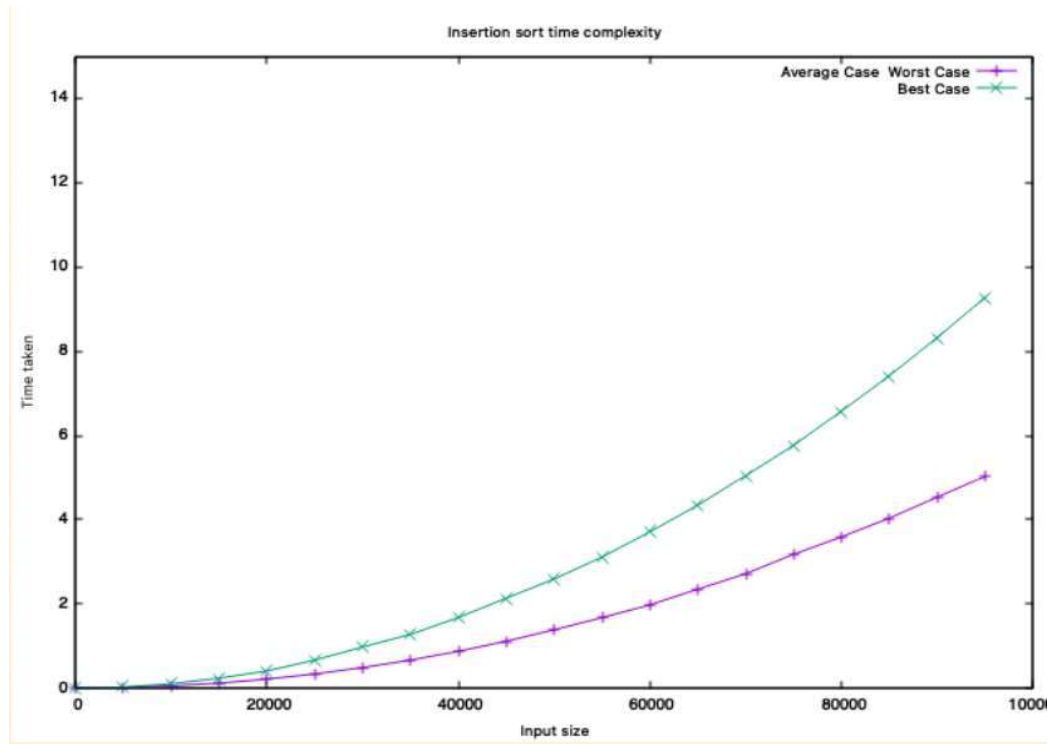
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set yr [0:40]

plot "bub.txt" using 1:2 title 'Average Case & Worst Case' with linespoints,\

"bub.txt" using 1:3 title 'Best Case' with linespoints

GRAPH



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