SELECTION SORT

Design and implement C/C++ Program to sort a given set of n integer elements using Selection Sort method and compute its time complexity. Run the program for varied values of n> 5000 and record the time taken to sort. Plot a graph of the time taken versus n. The elements can be read from a file or can be generated using the random number generator.

#include <stdio.h>

#include <stdlib.h>

#include <time.h>

void selectionSort(int arr[], int n)

{

int i, j, min;

for (i = 0; i < n-2; i++)

{

min = i;

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

{

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

min = j;

}

// Swap the found minimum element with the first element

int temp = arr[min];

arr[min] = arr[i];

arr[i] = temp;

}

}

int main() {

int n, i;

clock\_t start, end;

double cpu\_time\_used;

printf("Enter the number of elements: ");

scanf("%d", &n);

int \*arr = (int\*)malloc(n \* sizeof(int));

// Generating random numbers for array elements

srand(time(0));

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

{

arr[i] = rand() % 10000; // Generating numbers between 0 and 9999

}

// Sorting and calculating time taken

start = clock();

selectionSort(arr, n);

end = clock();

cpu\_time\_used = ((double) (end - start)) / CLOCKS\_PER\_SEC;

printf("Sorted array:\n");

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

{

printf("%d ", arr[i]);

}

printf("\n");

printf("Time taken for sorting: %f seconds\n", cpu\_time\_used);

free(arr);

return 0;

}