Data Structure
Practice Problems 3

2023000000033

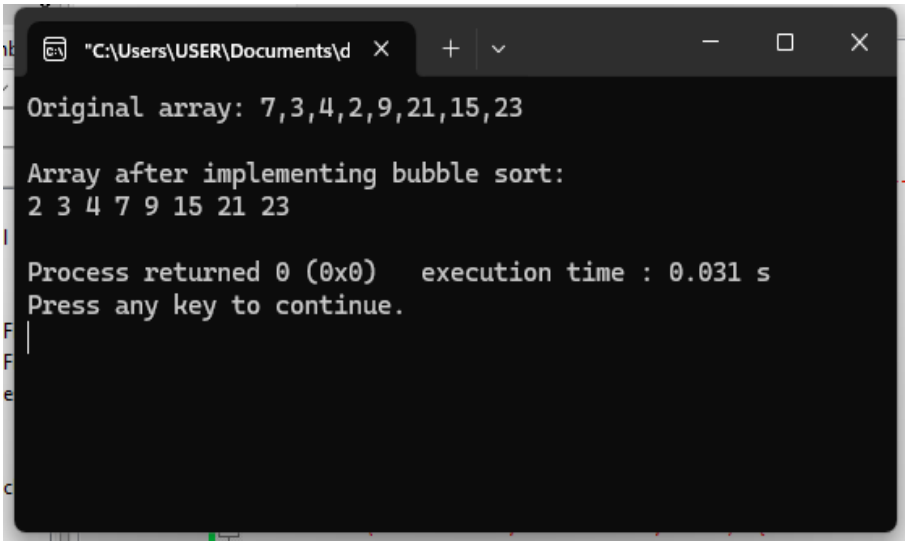
1. Consider the following unsorted array

7 3 4 2 9 21 15 23

i) Apply Bubble sort algorithm which will start comparing from last index to sort the array.

Solution:

```
#include<stdio.h>
int main(){
int arr[]={7,3,4,2,9,21,15,23};
int n=sizeof(arr)/sizeof(arr[0]);
printf("Original array: 7,3,4,2,9,21,15,23 ");
printf("\n"); printf("\n");
for(int i=0;i<n-1;i++){    //Bubble Sort
for(int j=n-1;j>i;j--){
if(arr[j-1]>arr[j]){
int tmp=arr[j-1];
arr[j-1]=arr[j];
arr[j]=tmp;
} } }
printf("Array after implementing bubble sort:\n");
for(int i=0;i<n;i++){
printf("%d ",arr[i]);
}   printf("\n");   return 0; }
```



ii) Apply Bubble sort algorithm which will start comparing from last index to sort the array. Apply Insertion sort algorithm which will start comparing from last index to sort the array.
iii)Insert 8 in the array in its sorted position.
[Hints: First, sort the array then insert 8 in the sorted position.]
solution:

```
#include<stdio.h>
int main(){
int arr[]={7,3,4,2,9,21,15,23};
printf("Original array:7,3,4,2,9,21,15,23 "); printf("\n");printf("\n");
int n=sizeof(arr)/sizeof(arr[0]);
for(int i=n-1;i>=0;i--){                    //Insertion Sort
int X=arr[i];
int j=i+1;
while(X>arr[j] && j<n){
arr[j-1]=arr[j];
arr[j]=X;
j=j+1;
} }
printf("Array after implementing insertion sort:\n");
for(int i=0;i<n;i++){
printf("%d ",arr[i]);
}
printf("\n");printf("\n");
int X=8;                                    //sort the array then insert 8 in the sorted position
int x=n+1;
int arr1[x];
for(int i=0;i<n;i++){
arr1[i]=arr[i];
}
int a;
for(int i=0;i<x;i++){
if(arr1[i]==X){
continue;
}
if(X<arr1[i] && X>=arr1[i-1]){
a=i;
for(int j=n-1;j>=i;j--){
arr1[j+1]=arr1[j];
} } }
arr1[a]=X;
printf("Array after inserting %d:\n",X);
for(int i=0;i<x;i++){
printf("%d ",arr1[i]);
} printf("\n"); return 0; }
```