

C++ Assignments Solution's.

Selection and insertion sorting.

1. Which of the following is true about selection sort:
 - a) In each iteration we find the minimum element in the unsorted part of the array.
 - b) In each iteration we find the index of the minimum element in the unsorted part of the array.
 - c) We swap the index of the minimum element with the first element of the array.
 - d) It takes $O(n^2)$ swaps.

ANSWER → a) In each iteration we find the minimum element in the unsorted part of the array.

2. Which of the following examples represent the worst case input for an insertion sort?
 - a) array in sorted order
 - b) large array
 - c) normal unsorted array
 - d) array sorted in reverse order

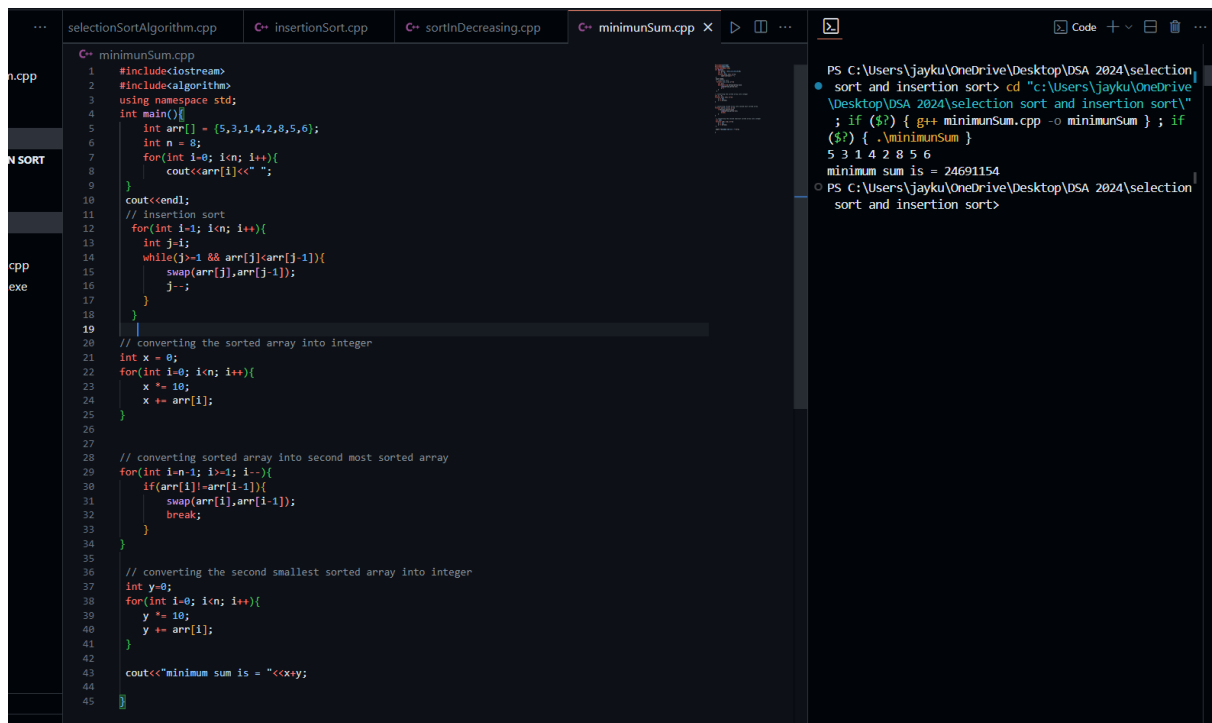
ANSWER → d) array sorted in reverse order

3. How many passes would be required during insertion sort to sort an array of 5 elements?
 - a) 1
 - b) Depends on order of elements
 - c) 4
 - d) 5

ANSWER → 4.

4. Given an array of digits (values are from 0 to 9), the task is to find the minimum possible sum of two numbers formed from digits of the array. Please note that all digits of the given array must be used to form the two numbers.

ANSWER →



```
1 #include<iostream>
2 #include<algorithm>
3 using namespace std;
4 int main()
5 {
6     int arr[] = {5,3,1,4,2,8,5,6};
7     int n = 8;
8     for(int i=0; i<n; i++){
9         cout<<arr[i]<<" ";
10    }
11    cout<<endl;
12    // insertion sort
13    for(int i=1; i<n; i++){
14        int j=i;
15        while(j>0 && arr[j]<arr[j-1]){
16            swap(arr[j],arr[j-1]);
17            j--;
18        }
19    }
20    // converting the sorted array into integer
21    int x = 0;
22    for(int i=0; i<n; i++){
23        x *= 10;
24        x += arr[i];
25    }
26
27    // converting sorted array into second most sorted array
28    for(int i=n-1; i>=1; i--){
29        if(arr[i]!=arr[i-1]){
30            swap(arr[i],arr[i-1]);
31            break;
32        }
33    }
34
35    // converting the second smallest sorted array into integer
36    int y=0;
37    for(int i=0; i<n; i++){
38        y *= 10;
39        y += arr[i];
40    }
41
42    cout<<"minimum sum is = "<<x+y;
43
44
45 }
```

PS C:\Users\jayku\OneDrive\Desktop\DSA 2024\selection sort and insertion sort> cd "c:\Users\jayku\OneDrive\Desktop\DSA 2024\selection sort and insertion sort\" ; if (\$?) { g++ minimumSum.cpp -o minimumSum } ; if (\$?) { .\minimumSum }
5 3 1 4 2 8 5 6
minimum sum is = 24691154
PS C:\Users\jayku\OneDrive\Desktop\DSA 2024\selection sort and insertion sort>

5. Given an array of strings arr[] with all strings in lowercase. Sort given strings using Bubble Sort and display the sorted array.

ANSWER→

```
C++ sortArrayString.cpp
1  #include<iostream>
2  #include<string>
3  #include<algorithm>
4  using namespace std;
5  int main(){
6      string arr[] = {"jayvardhan","akshar","jini","vidhan","vidhi"};
7      int n = 6;
8      for(int i=0; i<n; i++){
9          cout<<arr[i]<<endl;
10     }
11     // bubble sort
12     for(int i=0; i<n-1; i++){
13         for(int j=0; j<n-1; j++){
14             if(arr[j]>arr[j+1]){
15                 swap(arr[j],arr[j+1]);
16             }
17         }
18     }
19     cout<<endl;
20     for(int i=0; i<n; i++){
21         cout<<arr[i]<<endl;
22     }
23 }
24
25
```

```
● section sort> cd "c:\Users\jayku\OneDrive\Desktop\DSA 2024"
cd "c:\Users\jayku\OneDrive\Desktop\DSA 2024\selection sort and insertion sort\" ; if ($?) { g++ sortArrayString.cpp -o sortArrayString } ; if ($?) { .\sortArrayString }
○ jayvardhan
akshar
jini
vidhan
vidhi
khushi

akshar
jayvardhan
jini
khushi
vidhan
vidhi
PS C:\Users\jayku\OneDrive\Desktop\DSA 2024\selection sort and insertion sort>
```