**Algorithms**

**Laboratory Task-1**

**Submission Deadline** – As announced in the class

**Submission Guidelines**-

* Rename the file to your id only. If your id is 18-XXXXX-1, then the file name must be 18-XXXXX-1.docx.
* Must submit within the given deadline in VUES to the section named Lab Tak-1
* Must include resources for all the section named ‘Code’ and ‘Output (screenshot)’ in the table.

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| Question-1 – **Implement Linear Search** |
| **Pseudocode**  procedure linear\_search (list, value)  for each item in the list  if match item == value  return the item's location  end if  end for  end procedure |
| **Code:**  **#include <iostream>**  **using namespace std;**  **int searching(int arr[], int n, int x)**  **{**  **int i;**  **for (i = 0; i < n; i++)**  **if (arr[i] == x)**  **return i;**  **return -1;**  **}**  **int main(void)**  **{**  **int n;**  **cout << "Enter the number of elements: ";**  **cin >> n;**  **int arr[n];**  **cout << "Enter elements:" << endl;**  **for(int i = 0; i<n; i++) {**    **2 / 6**  **cin >> arr[i];**  **}**  **int x ;**  **cout << "Enter the number to search : " << endl;**  **cin >> x ;**  **int result = searching(arr, n, x);**  **(result == -1)?**  **cout << "Element is not present in array":**  **cout << "Element is present at index " << result;**  **return 0;**  **}** |
| **Output (Screenshot)** |

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| Question-2 – **Implement Bubblesort** |
| **Pseudocode**  begin BubbleSort(list)  for all elements of list  if list[i] > list[i+1]  swap(list[i], list[i+1])  end if  end for  return list  end BubbleSort |
| **Code**  **#include <iostream>**  **using namespace std;**  **void Swap(int \*x, int \*y)**  **{**  **int temp = \*x;**  **\*x = \*y;**  **\*y = temp;**  **}**  **void bubbleSort(int arr[], int n)**  **{**  **int i, j;**  **for (i = 0; i < n-1; i++)**  **for (j = 0; j < n-i-1; j++)**  **if (arr[j] > arr[j+1])**  **Swap(&arr[j], &arr[j+1]);**  **}**  **void printArray(int arr[], int n)**  **{**  **int i;**  **for (i=0; i < n; i++)**  **cout<<arr[i]<<" ";**  **cout<<endl;**  **}**  **int main()**  **{**  **int n,x,i;**  **cout<<"Enter size of array: ";**  **cin>>n;**  **int arr[n];**  **cout<<"Enter Array Elements: "<<endl;**  **for(i=0;i<n;i++)**  **{**  **cin>>arr[i];**  **}**  **bubbleSort(arr,n);**  **printArray(arr,n);**  **return 0;**  **}** |
| **Output (Screenshot)** |

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| Question-3 – **Implement Selectionsort** |
| **Pseudocode**  SELECTION-SORT(A)  for j ← 1 to n-1  smallest ← j  for i ← j + 1 to n  if A[ i ] < A[ smallest ]  smallest ← i  Exchange A[ j ] ↔ A[ smallest ] |
| **Code**  **#include <iostream>**  **using namespace std;**  **void Swap(int \*x, int \*y)**  **{**  **int temp = \*x;**  **\*x = \*y;**  **\*y = temp;**  **}**  **void selectionSort(int arr[], int n)**  **{**  **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;**  **Swap(&arr[min\_idx], &arr[i]);**  **}**  **}**  **void printArray(int arr[], int n)**  **{**  **int i;**  **for (i=0; i < n; i++)**  **cout<<arr[i]<<" ";**  **cout<<endl;**  **}**  **int main()**  **{**  **int n,x,i;**  **cout<<"Enter size of array: ";**  **cin>>n;**  **int arr[n];**  **cout<<"Enter Array Elements: ";**  **for(i=0;i<n;i++)**  **{**  **cin>>arr[i];**  **}**  **selectionSort(arr,n);**  **printArray(arr,n);**  **return 0;**  **}** |
| **Output (Screenshot)** |