Selection Sort:

Source Code:

```cpp
#include <bits/stdc++.h>
using namespace std;
void selectionSort(vector<int> &v)
{
    int n = v.size();
    int i, j, min_idx;
    for (i = 0; i < n - 1; i++)
    {
        min_idx = i;
        for (j = i + 1; j < n; j++)
        {
            if (v[j] < v[min_idx])
                min_idx = j;
        }
        if (min_idx != i)
            swap(v[min_idx], v[i]);
    }
    for (i = 0; i < n; i++)
    {
        cout << v[i] << " ";
    }
}
int main()
{
    vector<int> v = {64, 25, 12, 22, 11};
    cout << "Naman Mishra" << endl; cout
    << "2100320120113" << endl;
    cout << "Sorted array: \n";
    selectionSort(v);
    return 0;
}
```

OUTPUT:

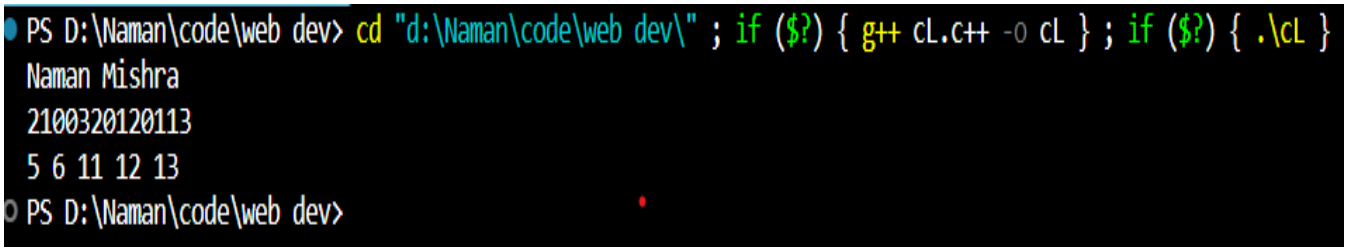
```
PS D:\Naman\code\web dev> cd "d:\Naman\code\web dev\" ; if ($?) { g++ cL.c++ -o cL } ; if ($?) { .\cL }
Naman Mishra
2100320120113
Sorted array:
11 12 22 25 64
PS D:\Naman\code\web dev>
```

Insertion sort:

Source Code:

```
#include <bits/stdc++.h>
using namespace std;
void insertionSort(vector<int> &arr)
{
    int n = arr.size();
    int i, temp, j;
    for (i = 1; i < n; i++)
    {
        temp = arr[i];
        j = i - 1;
        while (j >= 0 && arr[j] > temp)
        {
            arr[j + 1] = arr[j];
            j = j - 1;
        }
        arr[j + 1] = temp;
    }
    for (i = 0; i < n; i++)
        cout << arr[i] << " ";
    cout << endl;
}
int main()
{
    vector<int> arr = {12, 11, 13, 5, 6};
    cout << "Naman Mishra" << endl; cout
    << "2100320120113" << endl;
    insertionSort(arr);
    return 0;
}
```

OUTPUT:



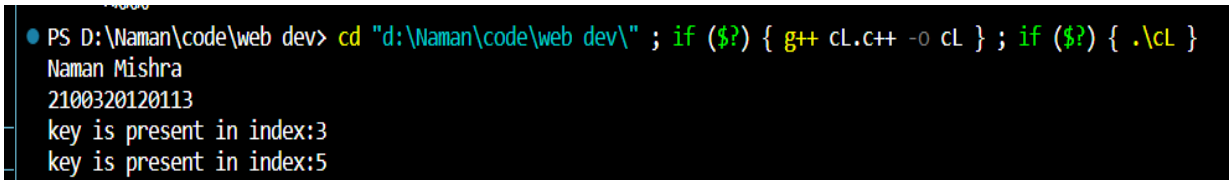
Linear Search

Source Code:

```
#include <iostream>
using namespace std;
void linear_search(int arr[], int n, int key)
{
    for (int i = 0; i < n; i++)
    {

        if (arr[i] == key)
        {
            cout << "key is present in index:" << i << endl;
        }
    }
}
int l_search(int arr[], int n, int i, int key)
{
    if (i == n)
    {
        return false;
    }
    else if (arr[i] == key)
    {
        return i;
    }
    else
    {
        return l_search(arr, n, i + 1, key);
    }
}

int main()
{
    int n = 7;
    int key = 6;
    int arr[n] = {1, 23, 5, 6, 8, 10, 9};
    cout << "Naman Mishra" << endl;
    cout << "2100320120113" << endl;
    linear_search(arr, n, key);
    key = 10;
    int r = l_search(arr, n, 0, key);
    if (r == 0)
    {
```

```
        cout << "Not key found";
    }
    else
        cout << "key is present in index:" << r;
    return 0;
}
```

Output:



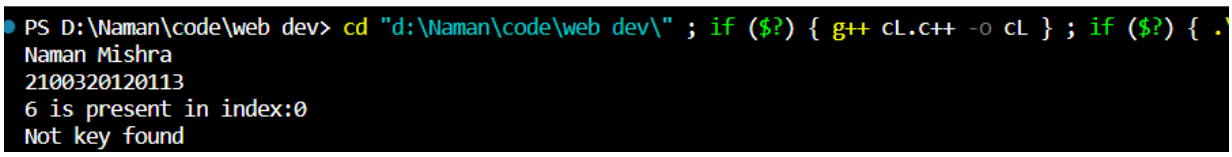
Binary Search

Source Code:

```
#include <iostream>
using namespace std;
// Iterative
int binarySearch(int arr[], int l, int r, int x)
{
    while (l <= r)
    {
        int m = l + (r - l) / 2;
        if (arr[m] == x)
            return m;

        if (arr[m] < x)
            l = m + 1;
        else
            r = m - 1;
    }
    return -1;
}
// Recursive
int b_Search(int arr[], int l, int r, int x)
{
    if (r >= l)
    {
        int mid = l + (r - l) / 2;

        if (arr[mid] == x)
            return mid;
        if (arr[mid] > x)
            return binarySearch(arr, l, mid - 1, x);
        return binarySearch(arr, mid + 1, r, x);
    }
}

int main()
{
    int n = 7;
    int key = 6;
    int arr[n] = {6, 10, 11, 20, 32, 56};
    cout << "Naman Mishra" << endl;
    cout << "2100320120113" << endl;
    int B = binarySearch(arr, 0, n - 1, key);
    if (B > 0)
```

```
        cout << "Not key found";
    else
        cout << key << " is present in index:" << B << endl;
    key = 10;
    int r = b_Search(arr, 0, n - 1, key);
    if (r > 0)
        cout << "Not key found";
    else
        cout << key << " is present in index:" << r << endl;
    return 0;
}
```

Output:



Bubble Sort
Source Code:

```
#include<bits/stdc++.h>
using namespace std;

void bubbleSort(int arr[], int n)
{
    int i, j;
    bool swapped;
    for (i = 0; i < n - 1; i++)
    {
        swapped = false;
        for (j = 0; j < n - i - 1; j++)
        {
            if (arr[j] > arr[j + 1])
            {
                swap(arr[j], arr[j + 1]);
                swapped = true;
            }
        }
        if (swapped == false)
            break;
    }
}

void printArray(int arr[], int size)
{
    int i;
    for (i = 0; i < size; i++)
        cout << " " << arr[i];
}

int main()
{
    int arr[] = {64, 34, 25, 12, 22, 11, 90};
    int N = sizeof(arr) / sizeof(arr[0]);
    cout << "Naman Mishra" << endl;
    cout << "2100320120113" << endl;
    bubbleSort(arr, N);
    cout << "Sorted array: \n";
    printArray(arr, N);
    return 0;
}
```

OUTPUT :

```
PS D:\Naman\code\web dev> cd "d:\Naman\code\web dev\" ; if ($?) { g++ cL.c++ -o cL } ; if ($?) { .\cL }
Naman Mishra
2100320120113
Given  array:
 64 34 25 12 22 11 90
Sorted array:
 11 12 22 25 34 64 90
PS D:\Naman\code\web dev>
```