1. Imagine you are managing a small library, and the books are currently arranged in a somewhat random order on the shelves. To organize the books alphabetically by the author's last name, you decide to use the Selection Sort algorithm. Write a C++ program that applies the Selection Sort algorithm to sort an array of book titles based on the author's last names.

2. Write a C++ program that allows the user to input an array of integers. Give the user the option to choose between Selection Sort and Insertion Sort for sorting the array. Execute the chosen sorting algorithm and display the sorted array.

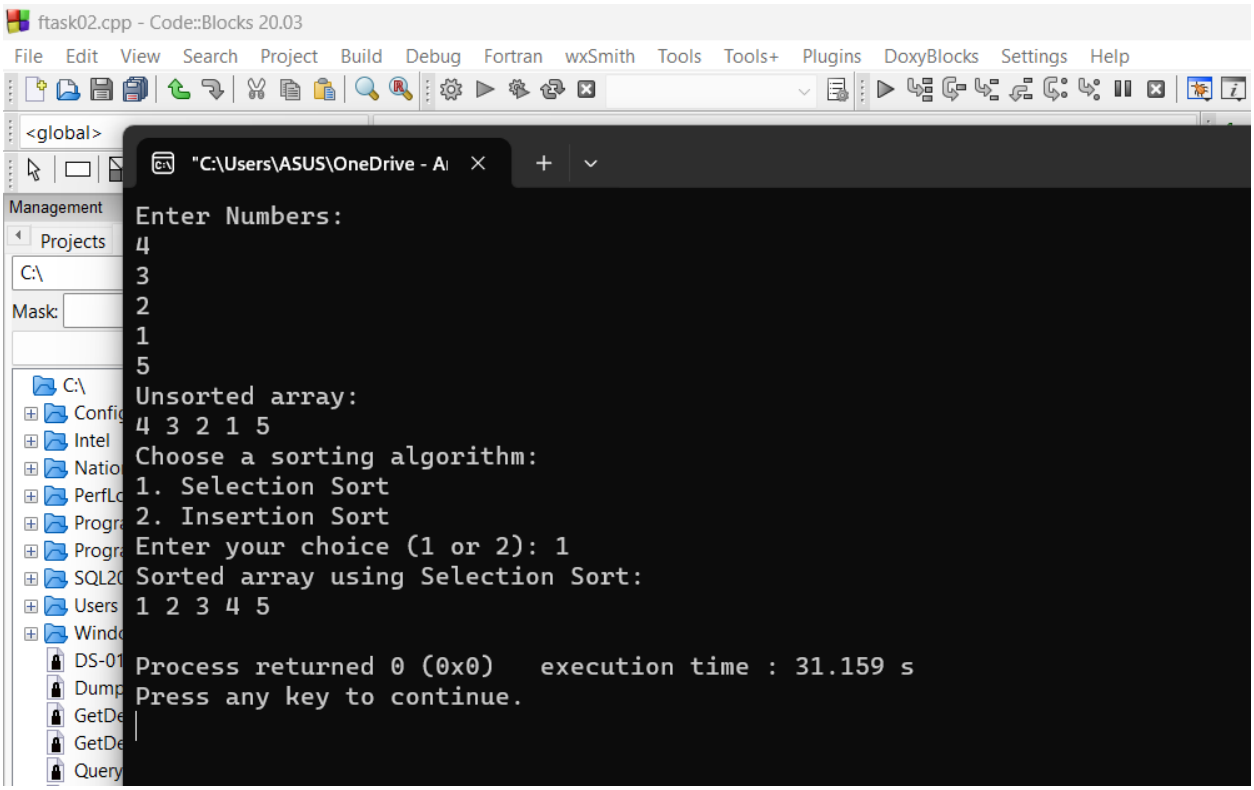
Ans to the Question No:2

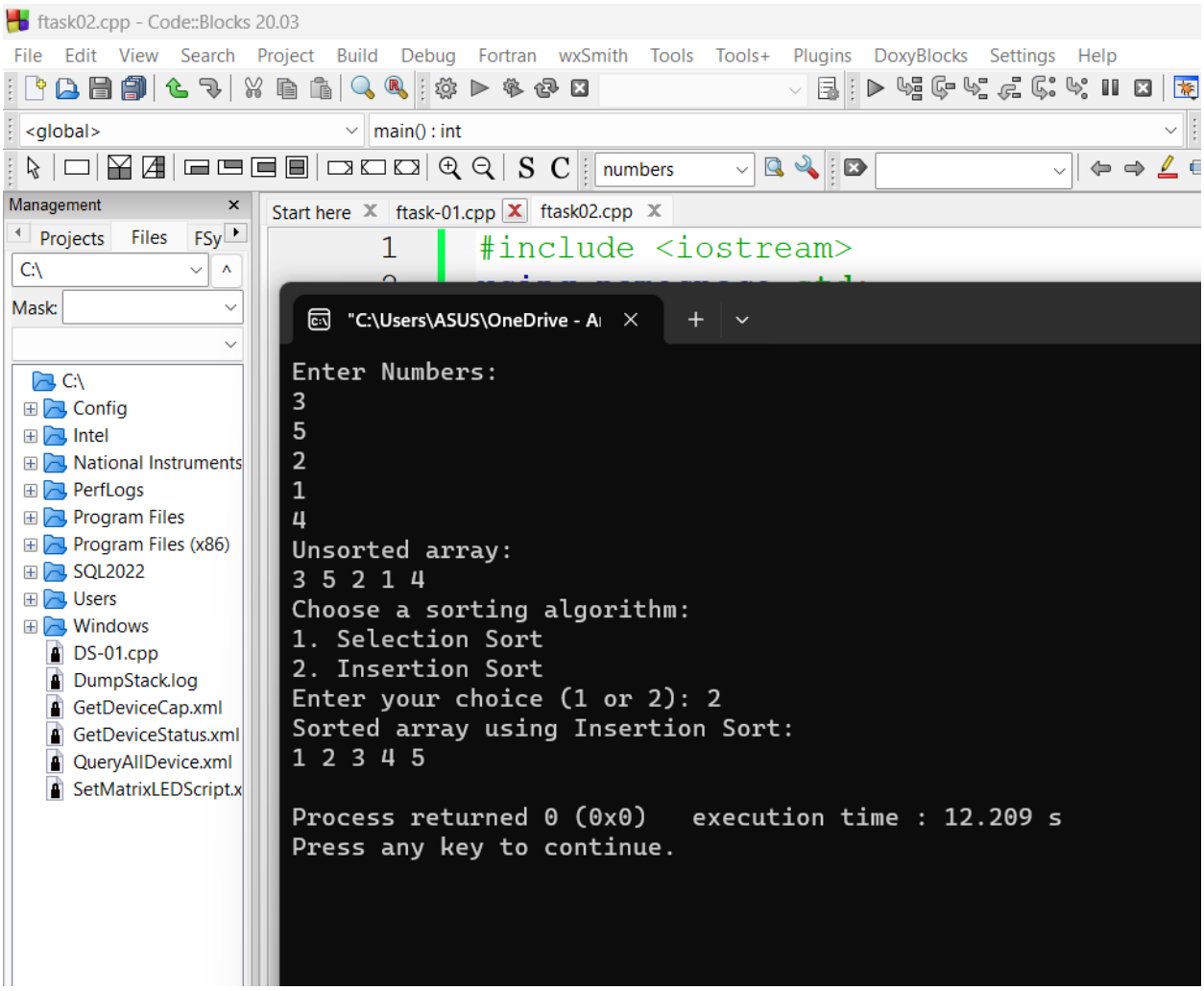
```
#include <iostream>
using namespace std;


void selectionSort(int arr[], int n) {
   for (int i = 0; i < n - 1; ++i) {
      int minIndex = i;
      for (int j = i + 1; j < n; ++j) {
         if (arr[j] < arr[minIndex]) {
            minIndex = j;
         }
      }

      if (minIndex != i) {
         swap(arr[i], arr[minIndex]);
      }
   }
}
```

```
void insertionSort(int arr[], int n) {
  for (int i = 1; i < n; ++i) {
      for (int j = i; j > 0 && arr[j - 1] > arr[j]; --j) {
         swap(arr[j - 1], arr[j]);
      }
   }
}

void displayArray(int arr[], int n) {
   for (int i = 0; i < n; ++i) {
      cout << arr[i] << " ";
   }
   cout << endl;
}

int main() {
   int maxSize = 5;
   int numbers[maxSize];
   int choice;



   cout << "Enter Numbers:" << endl;
   for (int i = 0; i < maxSize; ++i) {
```

```
    cin >> numbers[i];
}


cout << "Unsorted array:" << endl;
displayArray(numbers, maxSize);

cout << "Choose a sorting algorithm:" << endl;
cout << "1. Selection Sort" << endl;
cout << "2. Insertion Sort" << endl;
cout << "Enter your choice (1 or 2): ";
cin >> choice;

switch (choice) {
    case 1:
        selectionSort(numbers, maxSize);
        cout << "Sorted array using Selection Sort:" << endl;
        displayArray(numbers, maxSize);
        break;
    case 2:
        insertionSort(numbers, maxSize);
        cout << "Sorted array using Insertion Sort:" << endl;
        displayArray(numbers, maxSize);
        break;
```

```
    default:
        cout << "Invalid choice. Please enter 1 or 2." << endl;
        break;
    }

    return 0; }
```





Ans to the ques No:1

```
#include <iostream>
using namespace std;


void selectionSort(string arr[], int n) {
    for (int i = 0; i < n - 1; i++) {
        int minIndex = i;
        for (int j = i + 1; j < n; j++) {

            if (arr[j] < arr[minIndex]) {
```

```
            minIndex = j;
        }
    }

    if (i != minIndex) {
        swap(arr[i], arr[minIndex]);
    }
  }
}

int main() {

  const int numBooks = 5;
  string books[numBooks] = {
    "One Hundred Years of Solitude by Gabriel García Márquez",
    "The Lord of the Rings by John Ronald Reuel Tolkien",
    "Moby-Dick by Herman Melville",
    "Pride and Prejudice by Jane Austen",
    "Don Quixote by Miguel de Cervantes"
  };

  selectionSort(books, numBooks);

  cout << "Sorted Book Titles:" << endl;
```

```
    for (int i = 0; i < numBooks; i++) {
        cout << books[i] << endl;
    }

    return 0;
}
```