Quicksort Code:

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

void swap(int &a, int &b) {
   int temp = a;
   a = b;
   b = temp;
}
int partition(vector<int> &arr, int low, int high) {
   int pivot = arr[low];
   int i = low + 1;
   int j = high;

   while (true) {
      while (i <= high && arr[i] <= pivot) i++;
      while (j >= low + 1 && arr[j] > pivot) j--;

      if (i < j) {
         swap(arr[i], arr[j]);
      } else {
         break;
      }
   }
   swap(arr[low], arr[j]);
   return j;
}
void quicksort(vector<int> &arr, int low, int high) {
   if (low < high) {
      int pIndex = partition(arr, low, high);
      quicksort(arr, low, pIndex - 1);
      quicksort(arr, pIndex + 1, high);
   }
}

int main() {
   int n;
   cout << "Enter the Number of elements: ";
```

```
    cin >> n;

    if (n <= 0) {
        cout << "Invalid number of elements." << endl;
        return 1;
    }

    vector<int> A(n);
    for (int i = 0; i < n; i++) {
        cout << "Enter element number " << i + 1 << ": ";
        cin >> A[i];
    }

    cout << "\nOriginal Array: ";
    for (int x : A) {
        cout << x << " ";
    }

    quicksort(A, 0, n - 1);

    cout << "\nSorted Array: ";
    for (int x : A) {
        cout << x << " ";
    }
    cout << "\n";

    return 0;
}
```

Output:

```
Enter the Number of elements: 6
Enter element number 1: 10
Enter element number 2: 7
Enter element number 3: 8
Enter element number 4: 9
Enter element number 5: 1
Enter element number 6: 5

Original Array: 10 7 8 9 1 5
Sorted Array: 1 5 7 8 9 10
```