06/14/17 03:20:57 /Users/darkcloud/Desktop/Lab10/[Lab10] Adnar Lozano_partition.cpp

```cpp
/*input
5
4 5 3 7 2
*/
#include <iostream>
#include <vector>
using namespace std;

void partition(int ar_size, int *  ar) {
    int pivot = ar[0];
    vector <int> left;
    vector <int> right;
    for (int i = 1; i < ar_size; i++) {
        if (pivot <= ar[i])
            right.push_back(ar[i]);
        else left.push_back(ar[i]);
    }
    for (int i=0;i<left.size();i++)
        cout << left[i] << " ";
    cout << pivot << " ";
    for (int i=0;i<right.size();i++)
        cout << right[i] << " ";
}
int main(void) {
    int _ar_size;
    scanf("%d", &_ar_size);
    int _ar[_ar_size], _ar_i;
    printf("Partition:\n");
    printf("Sample Input:\n");
    printf("5\n");
    printf("4 5 3 7 2\n");
    printf("Output:\n");
    for(_ar_i = 0; _ar_i < _ar_size; _ar_i++)
        scanf("%d", &_ar[_ar_i]);
    partition(_ar_size, _ar);
    cout << endl;
    return 0;
}
```

06/14/17 03:21:15 /Users/darkcloud/Desktop/Lab10/[Lab10] Adnar Lozano_quick.cpp

```
 1  /*input
 2  7
 3  5 8 1 3 7 9 2
 4  */
 5  #include <iostream>
 6  #include <vector>
 7  using namespace std;
 8
 9  void quickSort(vector <int>  &ar) {
10      int size = ar.size();
11      if (size < 2) return;
12      vector <int> left;
13      vector <int> right;
14      int pivot = ar[0];
15
16      for (int i = 1; i < ar.size(); i++) {
17          if (ar[i] <= pivot)
18              left.push_back(ar[i]);
19          else right.push_back(ar[i]);
20      }
21      quickSort(left);
22      quickSort(right);
23      for (int i=0;i<left.size();i++)
24          cout << left[i] << " ";
25      cout << pivot << " ";
26      for (int i=0;i<right.size();i++)
27          cout << right[i] << " ";
28  }
29  int main(void) {
30      int n;
31      scanf("%d", &n);
32      vector <int> ar(n);
33      printf("Quick Sort:\n");
34      printf("Sample Input:\n");
35      printf("7\n");
36      printf("5 8 1 3 7 9 2\n");
37      printf("Output:\n");
38      for(int i = 0; i < ar.size(); i++)
39          scanf("%d", &ar[i]);
40      quickSort(ar);
41      cout << endl;
42      return 0;
43  }
```

06/14/17 03:20:13 /Users/darkcloud/Desktop/Lab10/[Lab10] Adnar Lozano_inplace.cpp

```cpp
/*input
7
1 3 9 8 2 7 5
*/
#include <iostream>
#include <vector>
#include <algorithm>
using namespace std;

int partition(vector<int> &v, int lo, int hi) {
    int pivot = v[hi];
    int i = lo - 1;
    for (int j = lo; j <= hi - 1;j++) {
        if (v[j] < pivot) {
            i++;
            swap(v[i],v[j]);
        }
    }
    swap(v[i+1], v[hi]);
    return i + 1;
}
void quickSort(vector <int> &v, int lo, int hi) {
    if (lo < hi) {
        int p = partition(v, lo, hi);
        for (int i = 0; i < v.size(); i++)
            cout << v[i] << " ";
        cout << endl;
        quickSort(v, lo, p-1);
        quickSort(v, p+1, hi);
    }
}
int main(void) {
    int n;
    scanf("%d", &n);
    vector <int> v(n);
    printf("Quick In-place:\n");
    printf("Sample Input:\n");
    printf("7\n");
    printf("1 3 9 8 2 7 5\n");
    printf("Output:\n");
    for(int i = 0; i < n; i++)
        scanf("%d", &v[i]);
    quickSort(v,0,v.size()-1);
    return 0;
}
```