Don Petersen

Week 6 Exercises

10) Recall the insertion sort algorithm as discussed in this chapter. Assume the following keys:

18, 8, 11, 9, 15, 20, 32, 61, 22, 48, 75, 83, 35, 3

Exactly how many key comparisons are executed to sort this list using insertion sort?

12) a) Write a function that implements bubble sort that stops the sorting process as soon as we find that in an iteration, no swapping of elements take place.

int BubbleSort(int numbers[], const int length)

{

int index = 0;

int lth = length - 1;

bool bDone = false;

while (! bDone)

{

bDone = true;

for (int scan = 0; scan < lth; scan++) {

if (numbers[scan] > numbers[scan+1]) {

// Swap the values

int temp = numbers[scan];

numbers[scan] = numbers[scan+1];

numbers[scan+1] = temp;

bDone = false;

}

}

--lth;

}

return length - lth - 1;

}

b) Find the number of iterations that are needed to sort the list: 64, 14, 52, 43, 75, 25, 80, 90, 95.

5

14) Write a C++ function that tales as input an array of items in descending order and the number of elements in the array. The function rearranges the elements in ascending order.

for (int i = 0; i < last; i++)

{

temp = numbers[i];

numbers[i] = numbers[last];

numbers[last] = temp;

last = last - 1;

}

16) What do the following statements do?

a) vector<int> list 50;

Creates a vector object list of size 50 with element type int.

b) vector<string> nameList;

Creates an empty vector object nameList of element type string without any elements.