**Lab 22 – List of strings + Parallel arrays**

**Lab Task 1**

**Problem Background:**

Following is the code for bubble sort algorithm for sorting strings in C++. The program uses an array of built-in string type.

#include <iostream>

#include<cmath>

using namespace std;

/\* This program sorts an array's values into ascending order \*/

#include <stdio.h>

#define SIZE 10

/\* function main begins program execution \*/

int main( void )

{

/\* initialize a \*/

//int a[ SIZE ] = {12, 8, 2, 6, 4, 10, 89, 68, 45, 37 };

string a[SIZE] = {"Lahore", "Karachi", "Gujrat", "Pindi", "Kohat", "Peshawar", "Bannu", "Quetta", "Wahndo", "Pindi"};

int pass; /\* passes counter \*/

int i; /\* comparisons counter \*/

string hold; /\* temporary location used to swap array elements \*/

/\* loop to control number of passes \*/

for ( pass = 0; pass < SIZE-1; pass++ ) {

/\* loop to control number of comparisons per pass \*/

for ( i = 0; i < SIZE - 1; i++ ) {

/\* compare adjacent elements and swap them if first

element is greater than second element \*/

if ( a[ i ] > a[ i + 1 ] ) {

hold = a[ i ];

a[ i ] = a[ i + 1 ];

a[ i + 1 ] = hold;

} /\* end if \*/

} /\* end inner for \*/

} /\* end outer for \*/

for ( i = 0; i < SIZE; i++ ) {

/\* loop to control number of comparisons per pass \*/

cout << a[i] << " ";

} /\* end inner for \*/

/\* end outer for \*/

} /\* end main \*/

**Problem Statement:**

Convert this program so that it uses a list of c-strings (i.e. list of character arrays). HINT: Now, you will need to call string library functions for string comparison and assignment.

**Lab Task 2**

**Problem Statement:**

Consider the following 2 arrays.

string a[SIZE] = {"Lahore", "Karachi", "Gujrat", "Pindi", "Kohat", "Peshawar", "Bannu", "Quetta", "Wahndo", "Pindi"};

int area[SIZE] = {100, 300, 15, 35, 12, 20, 18, 6, 35};

The first array contains city name, while the second array contains respective (hypothetical) city areas (in square kilometers), i.e. these are parallel arrays.

You have to sort cities using the bubble sort algorithm, but the respective city areas should also be in correct positions according to sorted cities. A sample output after traversing both the arrays simultaneously is given below.

Bannu 18

Gujrat 15

Karachi 300

Kohat 12

Lahore 100

Peshawar 20

Pindi 35

Pindi 0

Quetta 6

Wahndo 35