

CSY2006 Week 5

Lab Exercises:

1. Consider the following unsorted sets:

(i) 7 2 3 8 9 1

(ii) 55 22 44 11 33

(iii) 101 22 44 57 45 77

Sort the above set in ascending order manually using Bubble Sort Algorithm and display the elements in the set after each exchange performed. Modify the program BubbleSortDemo.cpp to display the set after each exchange/swap.

2. Consider the following unsorted set:

(i) 5 7 2 8 9 1

(ii) 8 29 19 7 45 18

(iii) 123 11 2 50 55 24 34

Sort the above set in ascending order manually using Selection Sort Algorithm and display the elements in the set after each exchange performed. Modify the program SelectionSortDemo.cpp to display the set after each exchange/swap.

3. Consider the following unsorted set:

7 2 4 6 3 1

25 12 37 65 24 17

101 27 33 45 27 68 55

Sort the above set in ascending order manually using Insertion Sort Algorithm and display the elements in the set after each exchange performed. Modify the program InsertionSortDemo.cpp to display the set after each pass.

4. Write a function that checks whether two vectors have the same elements in the same order. Demonstrate in a program.
5. Write a function that computes the alternating sum of all the elements in a vector. For example, if `alternating_sum` is called with a vector containing

1 4 9 16 9 7 4 9 11

then it computes

$1-4+9-16+9-7+4-9+11=-2$

6. Write a function that removes duplicates from a vector. For example, if `remove_duplicates` is called with a vector containing

1 4 9 16 9 7 4 9 11

then the vector is changed to

1 4 9 16 7 11

7. Charge Account Validation Modification
Modify the program from Last Week Exercises you wrote for the previous problem (Charge Account Validation) so it performs a binary search to locate valid account numbers. Use the selection sort algorithm to sort the array before the binary search is performed.
8. Rainfall statistics Modification
Modify the Rainfall Statistics program from Last Week Exercises you wrote for problem # 2. The program should display a list of months, sorted in order of rainfall, from highest to lowest.
9. String Selection Sort
Modify the `selectionSort` function given in (Pr8-5) in the sample programs folder on Nile so it sorts an array of strings instead of an array of ints. Test the function with a driver program.
10. Sorting Benchmarks
Write a program that uses two identical arrays of at least 20 integers. It should call a function that uses the bubble sort algorithm to sort one of the arrays in ascending order. The function should keep a count of

the number of exchanges it makes. The program then should call a function that uses the selection sort algorithm to sort the other array. It should also keep count of the number of the exchanges it makes. Display these values on the screen.