23.3.2016 / BIL 105E Practice Session Questions

Question 1) Write a C program to check whether a triangle is valid or not if its sides are given by the user.

HINT: The rule of being a valid triangle: the sum of two side lengths (all side lengths are integer) of a triangle is always greater than the third side and the differece of two side of a triangle is always smaller than the third side. If this is true for all three combinations of added side lengths, then you will have a triangle.

Formula: $|a-b| < c < a+b$ $|a-c| < b < a+c$ $|b-c| < a < b+c$

Question 2) Write a C program to find number of notes of 500, 100, 50,20,10,5,2,1 rupee are in given input amount, count the total number of notes and store it in output variable.

For example : Given amount is Rs. 689

Rs. 500 : 1 note

Rs. 100 : 1 note

Rs. 50 : 1 note

Rs. 20 : 1 note

Rs. 10 : 1 note

Rs. 5 : 1 note

Rs. 2 : 2 notes

Rs. 1 : 0 note

totalNumberOfNotes = 1+1+1+1+1+1+2 = 8

output=8

Question 3) "Insertion Sort algorithm"

Insertion sort is a simple sorting algorithm that builds the final sorted array (or list) one item at a time.

Insertion sort iterates, consuming one input element each repetition, and growing a sorted output list. Each iteration, insertion sort removes one element from the input data, finds the location it belongs within the sorted list, and inserts it there. It repeats until no input elements remain.

Sorting is typically done in-place, by iterating up the array, growing the sorted list behind it. At each array-position, it checks the value there against the largest value in the sorted list (which happens to be next to it, in the previous array-position checked). If larger, it leaves the element in place and moves to the next. If smaller, it finds the correct position within the sorted list, shifts all the larger values up to make a space, and inserts into that correct position.

A sample run for an array:

Enter the total number of all elements: 5

Enter 5 elements: 7 8 9 0 2

Sorted Array: 0 2 7 8 9

Question 4) "Matrix multiplication"