Assignment 5 (due 11 pm, Apr. 21, 2016)

Note:

a. Please write down handwriting part in HW5_ID.doc.
b. Create a directory HW5_ID to put HW5_ID, HW5_1_ID.cpp, HW5_2_ID.cpp
c. Zip the directory with name HW5_ID.zip for final submission
d. Incorrect formation files will not be graded.
e. You can check HW5_1_ID.cpp and HW5_2_ID.cpp in the test server before submission. The instruction of test server will be released later.
f. If you work with others for this assignment, please put their name in the HW5_ID.doc

Q1. Give two nature numbers, and write a program to check if the digits of a number is a permutation of the other. If yes, return 1, no, return 0, exception -1.

Note each digit of a number has to be saved in a node of a linked list
Ex : 123 is saved as 1->2->3
Ex : the digits of 123 is a permutation of 231

Q2. Give an implementation of Q1 in C++, and give the filename : HW5_1_ID.cpp

Input (cin) : n, m
Ex1 :
41 4
Output (cout) :
Ex1 :
0
Input (cin) : n, m
Ex2 :
41 14
Output (cout) :
Ex2 :
1

Q3. Give two numbers, and write an algorithm to calculate the sum of the two number.

Note : Each digit of the number is saved in a node of a linked list in reverse order.
Hint: 123 is saved as 3->2->1
Hint: Input : 123 456 are represented as 3->2->1, 6->5->4 : 321 + 642 = 963 (9->6->3)
Output : 369

Q4. Give an implementation of Q3 in C++, and give the filename : HW5_2_ID.cpp

Input : x, y are nature integers in reversed order
Ex :
12 8
Hint : 12 is saved as 2->1, and 8 is saved as 8
Output : sum
Ex : 92
Hint : 21 + 8 = 29

Q5. Implement an algorithm to find the kth to last element of a singly listed list, and analyze the complexity of your implementation. (This is handwriting homework)

Q6. Implement a stack with a single array. The stack has the operation : push_back, pop_back, size, Isempty (This is handwriting homework)

Q7. Implement a queue with a single array. The stack has the operation : push_back, pop_front, size, Isempty (This is handwriting homework)

Q8. Compare the difference between using array and linked list to implement stack.