CS 301 Data Structures and Algorithms

Homework 2

In this homework, you are going to implement a program that creates an unsorted list by using a ***linked list*** implemented by yourself. Students are ***NOT*** allowed to use LinkedList class or any other classes that offers list functions. It is ***REQUIRED*** to use an ItemType class and a NodeType struct to solve this homework. Failure to follow this rule will result in a 0.

The "data.txt" file has three lines of data

100, 110, 120, 130, 140, 150, 160

100, 130, 160

1@0, 2@3, 3@END

You need to

1. Create an empty unsorted list by yourself (You may reuse the code from our textbook.)
2. Add the numbers from the first line to the list using ***putItem()*** function.
   Then print all the current keys to command line in one line using ***printAll()***.
3. Delete the numbers given by the second line in the list by using ***deleteItem()*** function.
   Then print all the current keys to command line in one line using ***printAll()***..
4. ***putItem ()*** the numbers in the third line of the data file to the corresponding location in the list. For example, 1@0 means adding number 1 at position 0 of the list.
   Then print all the current keys to command line in one line using ***printAll()***.
5. You MUST use the original data file. You should NOT copy and paste the content to a new file.

You must implement the following functions by yourself and use them

1. putItem(parameter one is the object to be added): append the object at the end of the list.
2. putItem(parameter one is the object to be added, parameter two is the position starting from 0): insert the item at the position.
3. deleteItem(parameter is the key which is an integer): remove the item
4. getItem(parameter is the position value which starts from 0) returns the item object reference
5. printAll(parameter is the pointer that points to the beginning of the list), print all keys in order in the list.

Requirements:

1. ***[will be 0 if it does not compile or crash]*** The homework must be done in C++ and compatible to C++11. A readme.txt file about how to compile using g++ in command line should be provided. Your submission must be in a .zip or .tar.gz file. You are **NOT** allowed to use Standard Template Library to create the linked list.
2. [5%] The Following identification information must be included at the beginning of your cpp file.
   //Name: XXXXXXX
   //NetID: ab1234
   //Email: XXXX@csueastbay.edu
3. [16%*5] correct implementation of the five functions
4. [5%] Correct Output Format
5. [10%] Correct I/O of the data file