

CSIEB0100 Data Structures

Assignment 02: Arrays, Stacks and Queues

Shiow-yang Wu 吳秀陽

Department of Computer Science
and Information Engineering
National Dong Hwa University

Assignment 2a

1. The **sales records** of a company is kept in a file (**sales.txt**) consists of item sale records of all branch stores in the format (**storeID, itemID, #sold**). All **item prices** are in a different file (**prices.txt**) with the format (**itemID, price**). Choose appropriate data structures to represent the sales records and item prices. Write a C++ program to read in both files, compute and save into another file (**totalSales.txt**) the total sales records including:
 - a. The **revenue**(total sales) of each **branch store**
 - b. The **total #sold** for each **item** across all branches
 - c. The **revenue** of the **company**(i.e. grand total sales)

Assignment 2b

2. Extend the `Stack` template with a `void moveToTop(const KeyType& x)` method which searches the stack for the element `x` and move it to top if `x` exists. Do nothing otherwise. Test your method properly.
3. Similarly, extend the `Queue` template with `void moveToFront(const KeyType& x)` and `void moveToRear(const KeyType& x)` methods which searches the queue for the element `x` and move it to front or rear if `x` exists. Do nothing otherwise. Test your methods properly.

Assignment 2c

4. A `queuestack` is a data structure what combines queue and stack. If you push/pop, it acts like a stack. If you addRear/deleteFront, it acts like a queue, with the rear side of the queue coincides with the top side of the stack. Write a `QueueStack` template class to implement the new data structure. Test you class properly.

Due date: **Nov 23, 2023**