SCHOOL OF SCIENCE & TECHNOLOGY

EEET2482 – SOFTWARE ENGINEERING DESIGN

ASSIGNMENT 2 – A VIDEO STORE

SPECIFICATIONS

Genie's video store is a small, locally run video rental shop, which dealing mainly in classics movies and TV series. Jason, the store owner, for more than a decade, has used paper-based records to manage the videos items and the loan process. To catch up with the booming internet, Jason has decided to computerize its inventory, and conduct a computer-based rental process in order to better deal with the increasing number of items and the number of customers the store has to deal with. Furthermore, Jason also decided to include games as another line of rental products for his shop.

As a result, the video rental shop now deals with three basic types of item:

- Old movie records
- DVDs
- Video games

Every item in the shop has the following details:

- ID: a string that has the fowling format: Ixxx-yyyy
  - 'I' is the capital letter I.
  - 'xxx' is a unique code of 3 digits (e.g. 123)
  - '-' is a single hyphen character
  - 'yyyy' is the year the item was published (e.g. 1980)
  - An example of a valid ID is 'I001-2001'
- Title: captures the whole title of the item (e.g. 'Game of thrones')
- Rental type: Record, DVD, or Game
- Loan type: either 2-day loan or 1-week loan
- Number of copies held in stock (e.g. 1, 2, 3 or more)
- Rental fee (in USD)
- Rental status: either borrowed or available.

Movie records and DVDs can be further divided into several genres including:

- "Action"
- "Horror"
- "Drama"
- "Comedy"

There are three types of customer accounts in this online video store: **Guest account, Regular account and VIP account**.

A customer account has the following attributes.

- ID: has the following format 'Cxxx'
  - 'C' is the capital letter C.
  - 'xxx' is a unique code of 3 digits (e.g. 123)
  - An example of a valid ID is 'C001'
- Name
- Address
- Phone
- List of rentals

There are several rules that differentiate the three types of account.

- A Guest Account only allows the customer to rent maximum 2 Video items at a time.
- A Regular account or a VIP account can borrow any number of items in the store.
- A Guest customer that borrowed and successfully returned more than 3 Video items can be promoted to a Regular customer.
- A Regular customer that borrowed and successfully returned more than 3 Video items can be promoted to a VIP customer.
- A VIP account can accumulate reward points. When a VIP account has equal or more than 100 reward points, the customer can rent 1 item for free. Every rental a VIP customer makes, he will be rewarded 10 points.
- Only regular customers and VIP customers can borrow 2-day Video items. If a guest customer tried to borrow a 2-day video item, your system must print out an appropriate error message.

You will write a C++ program for the Genie online video rental store. The program will create new customer accounts and perform rent/return operations on existing items in the system. Your video rental system should have a collection of video items and a list of customers.

The system also has the following features:

- The ability to add, update and delete items from the database of stocked items.
- The ability to add, update customer from the database.
- The ability to increase the number of copies of an existing item (this is done when new stock arrives).
- The ability to read data from and save the data to disk (e.g. text files). This applied for any updates to the customer list and the item list, as described above.
- The ability to rent an item (hence decreasing the number of copies held in stock). It should not be possible to rent an item for which there are no copies held in stock. In this case, the item's rental status should be '**not available**' or '**borrowed**'.
- The ability to return an item (hence increasing the number of copies held in stock).
- The ability to promote a customer (from Guest to Regular or from Regular to VIP).
- The ability to display all items, sorted by titles or IDs.
- The ability to display all customer, sorted by names or IDs.
- The ability to display a group of customers according to their level (e.g. Guest, Regular, or VIP).
- The ability to display all items that have no copies in stock.
- The ability to search for an item that matches a specified title or ID.

  - Searches that match titles should display the information about that item, including title, genre, rental type, and the number of copies available.
- The ability to search for a customer that matches a specified name or ID.
  - Searches that match a customer should display the information about that customer including customer name and customer ID, phone, address.

Any interaction with the system should be via a simple text interface. The system should automatically load the database on startup, and save it before quitting. Several input files including "customers.txt" and "items.txt" are provided. You should be able to specify the name of the database file as a command line argument.

GENERAL SPECIFICATIONS

From the command line, your program can be executed as followed:

1. *assignment1_groupTT.exe*
   a. *where TT denotes your group number*
2. Once running, the user can input an option then press 'Enter'.
3. An example text interface could look like below:

   Welcome to Genie's video store
   Enter an option below.
   1. Add a new item, update or delete an existing item
   2. Add new customer or update an existing customer
   3. Promote an existing customer
   4. Rent an item
   5. Return an item
   6. Display all items
   7. Display out-of-stock items
   8. Display all customers
   9. Display group of customers
   10. Search items or customers

   Exit.

4. Sub-menu of certain options will be up to you to design according to the specifications.
5. Your program must validate user input accordingly.
6. Once a user decides to stop the program, the user can input the word "**Exit**" then press 'Enter'.
7. Before the program exits, each student ID string must be displayed to the console in the following form
   ASSIGNMENT 2 GROUP AA
   sXXXXXXX,sXXXXXXX@rmit.edu.vn,FirstName,LastName
   sYYYYYYY,sYYYYYYY@rmit.edu.vn,FirstName,LastName
   sZZZZZZZ,sZZZZZZZ@rmit.edu.vn,FirstName,LastName
   sTTTTTTT,sTTTTTTT@rmit.edu.vn,FirstName,LastName

OTHER SPECIFICATIONS

1. **You will need to demonstrate the Object-Oriented programming skills through coding classes, inheritance, function overloading/overriding, and polymorphism in your program.**
2. Your program must be compilable in Microsoft Visual Studio 2017. Programs submitted for assessment which are compiled under different environments (Operating Systems or Development Environments) are not likely to run correctly. If your program does not execute at all, you will only be eligible for 50% of your laboratory mark. The teaching staff will NOT be fixing code to make programs compile or for debugging issues during assessment.
3. Your group leader, as stated by Canvas, is responsible for submitting the group's work prior to the deadline. **Late submissions will incur a penalty of 10% per day**. **Submissions which are three days past the deadline will not be accepted and a grade of zero will be given**. An executable file of your CPP program, i.e. *assignment2_groupTT.exe*, and a zip file of all source code including .h and .cpp files (i.e. *assignment2_groupTT.zip*), will need to be submitted to Canvas for assessment, where *TT* denotes your group number.
4. You will be required to work in groups of three students.
5. No libraries, except for <iostream>, <sstream>, <fstream>, <string> and <vector>, can be used – **penalties will apply if other external libraries are used**.