Lab 02 | Working with Objects .02

CS202 Object Oriented Design and Programing Lab, Autumn'2018; pm_jat

Let us learn some more common Java [C++] objects.

(q01) Write a program ArrayDemo that has following functionality.

a. Create an array object (in main method) and store 10 random double values in it.
b. Create a *static method* **`normalize`**; that receive the array reference as parameter and normalizes all the data, that is, each element is replaced by $x_i = \frac{x_i - \bar{x}}{\sigma}$ where σ is standard deviation and computed as $\sqrt{\frac{x_i - \bar{x}}{n-1}}$
   Note: The function should not assume that all array elements have data; actual data in the array can be actually less than the array size.
c. Create another static method that again receives the same array object and returns following statistics of the dataset, as an array object- Average, SD, and Median.

(q02) You are given an already created Book class. Download the file (Java: Book.java; C++: Book.h and Book.cpp) and place in your work directory lab02. In java you may need to change package of Book class appropriately.

You are also given summary of interface of Book object file
"Interface of Book class_Java/C++.pdf"

Study interface of class **`java.util.LinkedList`**. [list in C++ Standard Template Library (STL)]. Figure out how can you perform INSERT, DELETE, SEARCH, Print-All operations on the linked list?

Write a program **`LinkedListDemo`** that creates a Linked List of given class of Book objects, and perform these operations.

(q03) Here we attempt simulating Book store and use two classes- Book that is given to you, and java library class `java.util.`**`HashMap`** [**`map`** in C++ Standard Template Library (STL)].

a. Create a program `BookStoreSimulator`, and put following functionality in the main method.
   i. Create an HashMap object to store Book objects, books are to be searched on ISBN, and type of ISBN is String, let us refer that HashMap object as book_store object (accessed through local referenced variable)
   ii. Put about 10 books into HashMap object known as book-store object
   iii. Simulate searching arbitrary number of books from book store.
   iv. Attempt removing some books from book store object

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b. Add an static function **`printAllBooks`** that receive reference to HashMap object containing books and print details of all book objects, formatted as following-

ISBN	Title	Price
101	ABC	245
102	XYZ	435
…		