SE116 – LAB#11 2023-2024 SPRING

Aim: Understanding the generic classes and methods.

Write a program to keep the storage records. The items in the storage are kept in the corresponding boxes, and the boxes are labelled according to their contents. Each box keeps only one item.

In the storage the following three kinds of items are kept: book, clothing and utensil. Implement the appropriate classes for each kind of item.

- The class `Book` has two private data members; `String name`, `String author`.
- The class `Clothing` has two private data members; `TypeEnum type`, `String color`. `TypeEnum` consists of different clothing types, such as dress, t-shirt, jeans etc.
- The class `Utensil` consists of two private data members; `String type`, `String material`.

Implement the appropriate set/get methods and parameterized/non-parameterized constructors for each of the above three classes.

Design and implement a generic class `Box<T>` that has the following private data members: `T item` and `String label`. The data member `item` represents a reference to a generic class type, which can be one of the three classes mentioned above.

Design and implement another class `Inventory` that handles storing, labeling and listing the items. The class `Inventory` has a private data member `ArrayList<Box<?>> storage` that keeps the records of all boxed items. The class `Inventory` also has the following methods:

- `public <T> String labelGenerator(T item)` : This method generates and returns a label according to the class of the item.
- `public <T> void storeItem(T item)` : This method puts the item in a box, labels the box accordingly and adds the box to the storage.
- `public void listAllItems()` : This method lists the labels of all boxes in the storage.

Finally, write a class `Test` that contains the `main()` method. In `main()` create three instances of each kind of item, add them to the storage, and display the storage contents.