RMIT University

Further Programming OUA

Practical Lab Week 3

Objective: the objective of this lab is to practice Collections, Maps, Generics, and reading from a file using Scanner.

1. The following program stores a list of integers. You are required to perform following operations on the list.
   A. Remove negative numbers
   B. Remove 2 from the list

```
import java.util.*;
public class ArrayListTest {
  public static void main(String args[]){
        ArrayList<Integer> list =
              new ArrayList<Integer>(Arrays.asList(1, 2, 3, -2, 5, -10));
        // Your code goes here
  }
}
```

2. The following program stores the employee number and first name of all the employees in the accountsMap and the quota allowed for each employee by name in the hash map quotaMap. You are required to print the quota against each employee number. Your code should use a loop and the appropriate methods. If no quota is allocated for a given account, print the message “no quota yet”.

```
import java.util.*;
public class
MapTest
{
   public static void main(String[] args)
   {
      Map <String, String> accountsMap = new HashMap<String,
      String>();accountsMap.put("E123", "Charles");
      accountsMap.put("E156", "Heiko");
      accountsMap.put("E542",
      "Brendan");accountsMap.put("E174",
      "Tobin");

      Map <String, String> quotaMap = new HashMap <String, String>();
      quotaMap.put("Charles",
      "5MB");quotaMap.put("Heiko",
      "50MB");
      quotaMap.put("Tobin", "4MB");
```

```
        quotaMap.put("Bruce", "8MB");
        //Your code goes here


    }
}
```

3. You are required to complete the following program by implementing a generic class that acts as a library for the following kinds of media: book and video. Feel free to use any additional APIs for storing and retrieving the media (e.g., ArrayList). You should include the following two methods in the library class:
   A. Add a media to the library
   B. Retrieve a media from the library (for simplicity, retrieve the last media added to the library)

```
class Video extends Media {
  Video(String name) {
        super(name);
  }
}

class Book extends Media {
  Book(String name) {
        super(name);
  }
}

public class GenericLibrary<E extends Media> {
    // Your code goes here
}
```

4. Create a CSVReader program and integrate the following snippet into your program to readthe following data stored in book.csv file:

```
ISBN, Author, Title, YearPublished
978-3-16-148410-0, Bruce Wayne, My First Year as Batman, 1963
332-3-26-198412-1, Clark Kent, Sun Man Revenge, 1991
```

   Use the following FileStream snippet and save the data into List of List of Strings.

```
List<List<String>> records = new ArrayList<>();
try (BufferedReader br = new
BufferedReader(newFileReader("book.csv"))) {
    String line;
    while ((line = br.readLine()) != null) {
        String[] values = line.split(COMMA_DELIMITER);
        records.add(Arrays.asList(values));
    }
}
```

5. Integrate the following snippet into your CSVReader program to Read the book.csv file using java.util.Scanner.

```
String COMMA_DELIMITER = ",";
List<List<String>> records = new ArrayList<>();
try (Scanner scanner = new Scanner(new File("book.csv"))) {
    while (scanner.hasNextLine()) {
        records.add(getRecordFromLine(scanner.nextLine()));
    }
}

private List<String> getRecordFromLine(String line) {
  List<String> values = new ArrayList<String>();
  try (Scanner rowScanner = new Scanner(line)) {
        rowScanner.useDelimiter(COMMA_DELIMITER);
        while (rowScanner.hasNext()) {
              values.add(rowScanner.next());
        }
  }
  return values;
}
```

6. Thinking in Object-Oriented way, modify the CSV reader program so that instead of using List of List of Strings, you use a List of Book objects. For that, you need to create a Book class with attributes that match with the order of 'columns' of the CSV file and pass these data through Book class constructor method argument.

   Hint: Consider the following constructor. How would you add a new book into the list without hard-coding each attribute?

```
new Book("978-3-16-148410-0", "Bruce Wayne", "My First Year as
Batman", 1963);
```