~~Hands-on Exercise Objective~~Problem statement: 1

~~After completing the hands-on exercises, you will be able to:~~

- Develop programs using ArrayList, HashMap, HashSet. &
- Use Iterator for iterating Collections.

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Problem Statement 1:

1. Develop a java class with a method ***storeEvenNumbers(int N)*** using ArrayList to store even numbers from 2 to N, where N is a integer which is passed as a parameter to the method ***storeEvenNumbers().*** The method should return the ArrayList (A1) created.
2. In the same class create a method **printEvenNumbers()**which iterates through the arrayList A1 in step 1, and It should multiply each number with 2 and display it in format 4,8,12….2*N. and add these numbers in a new ArrayList (A2). The new ArrayList (A2) created needs to be returned.
3. Create a method ***retrieveEvenNumber(int N)*** parameter is a number N. This method should search the arrayList (A1) for the existence of the number 'N' passed. If exists it should return the Number else return zero.
   Hint: Use instance variable for storing the ArrayList A1 and A2.

NOTE: You can test the methods using a main method.

Problem Statement 2:

1. Develop a java class with a instance variable ***Country*** HashSet (H1) add a method **storeCountryNames(String CountryName)** , the method should add the passed country to a HashSet (H1) and return the added HashSet(H1).
2. Develop a method ***retrieveCountry(String CountryName)*** which iterates through the ***HashSet*** and returns the country if exist else return null.

NOTE: You can test the methods using a main method.

Problem Statement 3:

1. Develop a java class with a instance variable ***CountryMap*** HashMap (M1) add a method **storeCountryCapital(String CountryName, String capital)** , the method should add the passed country and capital as key/value in the map M1 and return the Map (M1).

Key- Country	Value - Capital
India	Delhi
Japan	Tokyo

2. Develop a method ***retrieveCapital(String CountryName)*** which returns the capital for the country passed from the Map M1 created in step 1.
3. Develop a method ***retrieveCountry(String capitalName)*** which returns the country for the capital name passed from the Map M1 created in step 1.
4. Develop a method which iterates through the map M1 and creates another map M2 with Capital as the key and value as Country and returns the Map M2.

Key - Capital	Value – Country
Delhi	India
Tokyo	Japan

1. Develop a method which iterates through the map M1 and creates a ArrayList with all the Country names stored as keys. This method should return the ArrayList.

NOTE: You can test the methods using a main method.

Problem Statement 2:

Design a class **Book** containing following members:

bookID	NO.
title	text
author	text

Define Parameterized constructor to initialize Book object. Perform the below validations

If any of the validations fail, throw an user defined exception**InvalidBookException**.

Design a class called **BookStore** which contains an appropriate collection object to store Book instances.

Implement the below operations.

1. addBook(Book b)
   To add a new Book object into the collection.

2. searchByTitle(String title)
   Search a book based on title and if found, display the details

3. searchByAuthor(String author)
   Search a book based on author and if found, display the details

4. displayAll()
   Print the details of all the books

Store both classes in a package **com.book**.

Create a class **BookUtil** in package **com.bookutil** which has the main method.

- Read data from user for 3 Book objects.
  Call the addBook method to add the book objects into the collection
  Search the books by title and author
  Display all the book details

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Add on:

[bookid must be number.

Create a java class which will use a random number generator, and that value should be your id value.]

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5.Develop a utility method which will find the book to be published in a journal, to implement that add instance variable published, datatype - Boolean.

6.Create an array of 5 books then, Convert the array to a treeset object and use iterator to print them.

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