Exercises on Collections

1. **Create a list of elements as shown below into the LinkedList and name it as languages.**

**C**

**C++**

**Java**

**Kotlin**

**Python**

**Perl**

**Ruby**

**Display the created list.**

**Remove an element at index 5 and display the list**

**Remove ‘Kotlin’ and display the list**

**Remove all the scripting languages (Python, Ruby, Perl) with one statement and display the list.**

**Remove all the elements from the list and display the list.**

1. Create an ArrayList object students, and store the following students in that list.

Student

studentcode

studentname

age

state

|  |  |  |  |
| --- | --- | --- | --- |
| **Student Code** | **Student Name** | **Age** | **State** |
| AF0216223 | Aryan Raj | 21 | Andra Pradhesh |
| AF0216224 | Bivor Kumar | 22 | Andra Pradhesh |
| AF0216227 | SUSHMITA KUMARI | 23 | Madhya Pradesh |
| AF0216231 | Ragiv Zafar | 24 | Maharashtra |
| AF0216232 | RAHUL MAHTO | 25 | Orissa |
| AF0216234 | Nainsi Kumari | 19 | Gujarath |
| AF0216236 | MD ALI | 26 | Madhya Pradesh |
| AF0216238 | ABHISHEK KUMAR | 22 | Andra Pradhesh |
| AF0216240 | AFROZ ANSARI | 21 | Maharashtra |
| AF0216259 | RITIK RAJ | 20 | Orissa |
| AF0216263 | Anant Kumar | 25 | Andra Pradhesh |
| AF0216305 | BABU KUMAR | 24 | Gujarath |
| AF0216307 | NIKITA KUMARI | 23 | Madhya Pradesh |
| AF0216353 | PRANAV PANDEY | 22 | Orissa |
| AF0216964 | Radheshyam Kumar | 21 | Maharashtra |
| AF0216973 | Ankur Utpal | 19 | Gujarath |
| AF0217607 | Banty Mishra | 18 | Madhya Pradesh |
| AF0217615 | RIYA KUMARI | 20 | Madhya Pradesh |
| AF0217791 | Priyadarshani Kumari | 21 | Maharashtra |
| AF0223373 | Chanchal Thakur | 22 | Orissa |
| AF0221549 | SATENDRA KUMAR | 23 | Maharashtra |
| AF0216212 | Pappi Verma | 24 |  |
| AF0216244 | Ramkrishna Kushwah | 25 | Andra Pradhesh |
| AF0216245 | Yogita Tamoliya | 26 | Orissa |
| AF0216246 | Goutam Rathore | 20 | Maharashtra |
| AF0216247 | Bablu jadhav | 19 | Madhya Pradesh |
| AF0216248 | Arbaj Sheikh | 22 | Madhya Pradesh |
| AF0216256 | Raja Saini | 26 | Madhya Pradesh |
| AF0216284 | Divyanshu Tiwari | 24 | Gujarath |
| AF0217621 | Yash Upadhyay | 22 | Maharashtra |
| AF0090331 | JAGADISH CHATURVEDI | 20 | Maharashtra |
| AF0208998 | MISHAN CHANDRAKALA | 21 | Gujarath |
| AF0209009 | PAWAN PAWAR | 19 | Karnataka |
| AF0188217 | DIVYAM PANDEY | 28 | Goa |
| AF0210410 | AMRUTA PRAMODRAO PHUKE | 26 | Gujarath |
| AF0188227 | V DELHI RAJU | 24 | Goa |
| AF0213766 | ACHUGATLA ELIYAZ BASHA | 20 | Karnataka |
| AF0173587 | ANKIT KUMAR GOUD | 19 | Karnataka |
| AF0143570 | BHAGYASHRI RAMAKANT VISHWASRAO | 18 | Karnataka |
| AF0130214 | RAMAN SUMAN | 22 | Goa |
| AF0109212 | SOUGATA PRAMANIK | 22 | Gujarath |
| AF0149241 | SOUMYA RANJAN NAYAK | 22 | Karnataka |
| AF0188268 | SONU PARMAR | 25 | Goa |
| AF0208755 | M ARCHANA | 25 | Karnataka |
| AF0082432 | PRADEEP SHUKLA | 25 | Gujarath |

**Find the students aged over 20**

**Find students from the state Andhra Pradhesh**

**Sort students by their age.**

1. **Write a method minToFront that takes an ArrayList of integers as a parameter and that moves the minimum value in the list to the front, otherwise preserving the order of the elements.**

**For example, if a list stores the following values: {3, 8, 92, 4, 2, 17, 9} and you make this call: minToFront(list); it should store the following values after the call: {2, 3, 8, 92, 4, 17, 9} .**

**You may assume that the list stores at least one value**

1. **Given an element write a program to check if element (value) exists in ArrayList?**
2. **Write a program to add elements to the HashMap given the key and value data type is String?**
3. Write a static method to find the sum of all the even numbers in an ArrayList. Within main, create a list with at least 10 integers and call your method on the list.
4. Write a static method to print out each word in a list that has exactly 5 letters.
5. Modify your code to prompt the user to enter the word length for the search.
6. Make a program  StudentHashMap that does the following:
7. It takes in student names and ID numbers (as integers) instead of names and grades.
8. The keys should be the IDs and the values should be the names.
9. Display the values.
10. Design a class Book containing following members:

bookID text

title text

author text

category text

price float

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

• Category must be “Science”, “Fiction”, “Technology” or “Others”

(Create a Enum called CategoryType and put above categories inside it.)

• Price cannot be negative

• bookID must start with ‘B’ and must be of length 4 characters

If any of the validations fail, throw a 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 all three classes in a package com.book.bll

Create a class BookUtil in package com.book.pll which has the main method.

• Instantiate the BookStore class

• 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