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Assignment NO :08

1. Create objects of class student(roll number, name and gender), perform different operations on below collection components 1. ArrayList 2. LinkedList 3. ArrayDeque 4. PriorityQueue 5. HashSet 6. TreeSet 7. HashMap 8. LinkedHashMap.

Program :

```
import java.util.*;
class Student {
private int rollNumber;
private String name;
private String gender;
public Student(int rollNumber, String name, String gender) {
this.rollNumber = rollNumber;
this.name = name;
this.gender = gender;
}
public int getRollNumber() {
return rollNumber;
}
public String getName() {
return name;
}
public String getGender() {
return gender;
}
public String toString() {
return "Roll No: " + rollNumber + ", Name: " + name + ", Gender: " + gender;
}
}
public class Question_1 {
public static void main(String[] args) {
// Creating a list of Student objects
List<Student> studentList = new ArrayList<>();
studentList.add(new Student(1, "Ishani", "Female"));
studentList.add(new Student(2, "Krish", "Male"));
studentList.add(new Student(3, "Sujay", "Male"));
studentList.add(new Student(4, "Minal", "Female"));
// ArrayList
System.out.println("List Size: " + studentList.size());
System.out.println("ArrayList:");
for (Student s : studentList) {
System.out.println(s);
```

```
}
// LinkedList
List<Student> linkedList = new LinkedList<>(studentList);
System.out.println("\nLinkedList:");
for (Student s : linkedList) {
System.out.println(s);
}
// ArrayDeque
Deque<Student> arrayDeque = new ArrayDeque<>(studentList);
System.out.println("\nArrayDeque:");
while (!arrayDeque.isEmpty()) {
System.out.println(arrayDeque.pop());
}
// PriorityQueue
Queue<Student> priorityQueue = new PriorityQueue<>(studentList.size(),
Comparator.comparingInt(Student::getRollNumber));
priorityQueue.addAll(studentList);
System.out.println("\nPriorityQueue:");
while (!priorityQueue.isEmpty()) {
System.out.println(priorityQueue.poll());
}
// HashSet
Set<Student> hashSet = new HashSet<>(studentList);
System.out.println("\nHashSet:");
for (Student s : hashSet) {
System.out.println(s);
}
// TreeSet
Set<Student> treeSet = new
TreeSet<>(Comparator.comparingInt(Student::getRollNumber));
treeSet.addAll(studentList);
System.out.println("\nTreeSet:");
for (Student s : treeSet) {
System.out.println(s);
}
// HashMap
Map<Integer, Student> hashMap = new HashMap<>();
for (Student s : studentList) {
hashMap.put(s.getRollNumber(), s);
}
System.out.println("\nHashMap:");
for (Map.Entry<Integer, Student> entry : hashMap.entrySet()) {
System.out.println("Roll No: " + entry.getKey() + ", Student: " +
entry.getValue());
}
// LinkedHashMap
Map<Integer, Student> linkedHashMap = new LinkedHashMap<>();
for (Student s : studentList) {
linkedHashMap.put(s.getRollNumber(), s);
}
```

```
System.out.println("\nLinkedHashMap:");
for (Map.Entry<Integer, Student> entry : linkedHashMap.entrySet()) {
System.out.println("Roll No: " + entry.getKey() + ", Student: " +
entry.getValue());
}
}
}
```

Output :

```
PS D:\22620004> javac Question_1.java
PS D:\22620004> java Question_1
List Size: 4
ArrayList:
Roll No: 1, Name: Ishani, Gender: Female
Roll No: 2, Name: Krish, Gender: Male
Roll No: 3, Name: Sujay, Gender: Male
Roll No: 4, Name: Minal, Gender: Female

LinkedList:
Roll No: 1, Name: Ishani, Gender: Female
Roll No: 2, Name: Krish, Gender: Male
Roll No: 3, Name: Sujay, Gender: Male
Roll No: 4, Name: Minal, Gender: Female

ArrayDeque:
Roll No: 1, Name: Ishani, Gender: Female
Roll No: 2, Name: Krish, Gender: Male
Roll No: 3, Name: Sujay, Gender: Male
Roll No: 4, Name: Minal, Gender: Female

PriorityQueue:
Roll No: 1, Name: Ishani, Gender: Female
Roll No: 2, Name: Krish, Gender: Male
Roll No: 3, Name: Sujay, Gender: Male
Roll No: 4, Name: Minal, Gender: Female
```

```
TreeSet:
Roll No: 1, Name: Ishani, Gender: Female
Roll No: 2, Name: Krish, Gender: Male
Roll No: 3, Name: Sujay, Gender: Male
Roll No: 4, Name: Minal, Gender: Female

HashMap:
Roll No: 1, Student: Roll No: 1, Name: Ishani, Gender: Female
Roll No: 2, Student: Roll No: 2, Name: Krish, Gender: Male
Roll No: 3, Student: Roll No: 3, Name: Sujay, Gender: Male
Roll No: 4, Student: Roll No: 4, Name: Minal, Gender: Female

LinkedHashMap:
Roll No: 1, Student: Roll No: 1, Name: Ishani, Gender: Female
Roll No: 2, Student: Roll No: 2, Name: Krish, Gender: Male
Roll No: 3, Student: Roll No: 3, Name: Sujay, Gender: Male
Roll No: 4, Student: Roll No: 4, Name: Minal, Gender: Female
PS D:\22620004>
```

2. . Create objects of class book(ISBN number, name and price), perform different operations on below collection components 1. ArrayList 2. LinkedList 3. ArrayDeque 4. PriorityQueue 5. HashSet 6. TreeSet 7. HashMap 8. LinkedHashMap

Program :

```java
import java.util.*;
class Book {
private int isbnNumber;
private String name;
private double price;
public Book(int isbnNumber, String name, double price) {
this.isbnNumber = isbnNumber;
this.name = name;
this.price = price;
}
public int getIsbnNumber() {
return isbnNumber;
}
public String getName() {
return name;
}
public double getPrice() {
return price;
}
```

```
public String toString() {
return "ISBN No: " + isbnNumber + ", Name: " + name + ", Price: " + price;
}
}
public class Question_2 {
public static void main(String[] args) {
// Creating a list of Book objects
List<Book> bookList = new ArrayList<>();
bookList.add(new Book(1001, "CA", 12.99));
bookList.add(new Book(1002, "CN", 19.99));
bookList.add(new Book(1003, "TOC", 8.99));
bookList.add(new Book(1004, "SE", 14.99));
bookList.add(new Book(1005, "ES", 21.99));
// a. ArrayList
System.out.println("ArrayList:");
for (Book b : bookList) {
System.out.println(b);
}
// b. LinkedList
List<Book> linkedList = new LinkedList<>(bookList);
System.out.println("\nLinkedList:");
for (Book b : linkedList) {
System.out.println(b);
}
// c. ArrayDeque
Deque<Book> arrayDeque = new ArrayDeque<>(bookList);
System.out.println("\nArrayDeque:");
while (!arrayDeque.isEmpty()) {
System.out.println(arrayDeque.pop());
}
// d. PriorityQueue
Queue<Book> priorityQueue = new PriorityQueue<>(bookList.size(),
Comparator.comparingDouble(Book::getPrice));
priorityQueue.addAll(bookList);
System.out.println("\nPriorityQueue:");
while (!priorityQueue.isEmpty()) {
System.out.println(priorityQueue.poll());
}
// e. HashSet
Set<Book> hashSet = new HashSet<>(bookList);
System.out.println("\nHashSet:");
for (Book b : hashSet) {
System.out.println(b);
}
// f. TreeSet
Set<Book> treeSet = new TreeSet<>(Comparator.comparingInt(Book::getIsbnNumber));
treeSet.addAll(bookList);
System.out.println("\nTreeSet:");
for (Book b : treeSet) {
System.out.println(b);
```

```
}
// g. HashMap
Map<Integer, Book> hashMap = new HashMap<>();
for (Book b : bookList) {
hashMap.put(b.getIsbnNumber(), b);
}
System.out.println("\nHashMap:");
for (Map.Entry<Integer, Book> entry : hashMap.entrySet()) {
System.out.println("ISBN No: " + entry.getKey() + ", Book: " +
entry.getValue());
}
// h. LinkedHashMap
Map<Integer, Book> linkedHashMap = new LinkedHashMap<>();
for (Book b : bookList) {
linkedHashMap.put(b.getIsbnNumber(), b);
}
System.out.println("\nLinkedHashMap:");
for (Map.Entry<Integer, Book> entry : linkedHashMap.entrySet()) {
System.out.println("ISBN No: " + entry.getKey() + ", Book " + entry.getValue());
}
}
}
```

Output :

```
PS D:\22620004> javac Question_2.java
PS D:\22620004> java Question_2
ArrayList:
ISBN No: 1001, Name: CA, Price: 12.99
ISBN No: 1002, Name: CN, Price: 19.99
ISBN No: 1003, Name: TOC, Price: 8.99
ISBN No: 1004, Name: SE, Price: 14.99
ISBN No: 1005, Name: ES, Price: 21.99

LinkedList:
ISBN No: 1001, Name: CA, Price: 12.99
ISBN No: 1002, Name: CN, Price: 19.99
ISBN No: 1003, Name: TOC, Price: 8.99
ISBN No: 1004, Name: SE, Price: 14.99
ISBN No: 1005, Name: ES, Price: 21.99

ArrayDeque:
ISBN No: 1001, Name: CA, Price: 12.99
ISBN No: 1002, Name: CN, Price: 19.99
ISBN No: 1003, Name: TOC, Price: 8.99
ISBN No: 1004, Name: SE, Price: 14.99
ISBN No: 1005, Name: ES, Price: 21.99
```

```
PriorityQueue:
ISBN No: 1003, Name: TOC, Price: 8.99
ISBN No: 1001, Name: CA, Price: 12.99
ISBN No: 1004, Name: SE, Price: 14.99
ISBN No: 1002, Name: CN, Price: 19.99
ISBN No: 1005, Name: ES, Price: 21.99

HashSet:
ISBN No: 1003, Name: TOC, Price: 8.99
ISBN No: 1004, Name: SE, Price: 14.99
ISBN No: 1005, Name: ES, Price: 21.99

HashMap:
ISBN No: 1001, Book: ISBN No: 1001, Name: CA, Price: 12.99
ISBN No: 1002, Book: ISBN No: 1002, Name: CN, Price: 19.99
ISBN No: 1003, Book: ISBN No: 1003, Name: TOC, Price: 8.99
ISBN No: 1004, Book: ISBN No: 1004, Name: SE, Price: 14.99
ISBN No: 1005, Book: ISBN No: 1005, Name: ES, Price: 21.99

LinkedHashMap:
ISBN No: 1001, Book ISBN No: 1001, Name: CA, Price: 12.99
ISBN No: 1002, Book ISBN No: 1002, Name: CN, Price: 19.99
ISBN No: 1003, Book ISBN No: 1003, Name: TOC, Price: 8.99
ISBN No: 1004, Book ISBN No: 1004, Name: SE, Price: 14.99
ISBN No: 1005, Book ISBN No: 1005, Name: ES, Price: 21.99
PS D:\22620004>
```