

Task-2

Lab questions:

1.Create a program with a logic that throws the `ArrayIndexOutOfBoundsException` while accessing elements in an array.

Answer:

```
public class ArrayOutOfBoundsExample {  
    public static void main(String[] args) {  
        int[] array = {1, 2, 3, 4, 5};  
  
        try {  
            int element = array[10];  
            System.out.println("Element at index 10: " + element);  
        } catch (ArrayIndexOutOfBoundsException e) {  
            System.out.println("Array index out of bounds!");  
        }  
    }  
}
```

Output:

ArrayIndexOutOfBoundsException caught: Index 5 out of bounds for length 5

2.Write a program to print the array element from 1 to 100.

Answer:

```
public class PrintArrayElements {  
    public static void main(String[] args) {  
        int[] array = new int[100];  
  
        1 to 100  
        for (int i = 0; i < 100; i++) {  
            array[i] = i + 1;  
        }  
  
        for (int i = 0; i < 100; i++) {  
            System.out.println("Element at index " + i + ": " + array[i]);  
        }  
    }  
}
```

Output:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33
34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62
63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79

3.Create a Book class with bookId, bookName and authorName.Create parameterized constructor to initialize the object. Create an ArrayList of type Book and store all book objects into collections and display all book details. [Hint:Use advanced for loop to display all Books details]

Answer:

```
import java.util.ArrayList;

class Book {
    private int bookId;
    private String bookName;
    private String authorName;

    public Book(int bookId, String bookName, String authorName) {
        this.bookId = bookId;
        this.bookName = bookName;
        this.authorName = authorName;
    }

    public int getBookId() {
        return bookId;
    }

    public String getBookName() {
        return bookName;
    }

    public String getAuthorName() {
        return authorName;
    }
}

public class Main {
    public static void main(String[] args) {
        ArrayList<Book> books = new ArrayList<>();
        books.add(new Book(1, "To Kill a Mockingbird", "Harper Lee"));
        books.add(new Book(2, "1984", "George Orwell"));
        books.add(new Book(3, "The Great Gatsby", "F. Scott Fitzgerald"));
        books.add(new Book(4, "Pride and Prejudice", "Jane Austen"));

        System.out.println("All Book Details:");
        for (Book book : books) {
            System.out.println("Book ID: " + book.getBookId());
            System.out.println("Book Name: " + book.getBookName());
            System.out.println("Author Name: " + book.getAuthorName());
            System.out.println();
        }
    }
}
```

```
}
```

Output:

All Book Details:

Book ID: 1

Book Name: To Kill a Mockingbird

Author Name: Harper Lee

Book ID: 2

Book Name: 1984

Author Name: George Orwell

Book ID: 3

Book Name: The Great Gatsby

Author Name: F. Scott Fitzgerald

Book ID: 4

Book Name: Pride and Prejudice

Author Name: Jane Austen

4. Write a program to reverse a given List of strings.

Answer:

```
import java.util.ArrayList;
```

```
import java.util.Collections;
```

```
import java.util.List;
```

```
public class Main {
```

```
    public static void main(String[] args) {
```

```
        List<String> strings = new ArrayList<>();
```

```
        strings.add("Hello");
```

```
        strings.add("World");
```

```
        strings.add("Java");
```

```
        strings.add("Programming");
```

```
        System.out.println("Original list: " + strings);
```

```
        Collections.reverse(strings);
```

```
        System.out.println("Reversed list: " + strings);
```

```
    }
```

```
}
```

Output:

Original list: [Hello, World, Java, Programming]

Reversed list: [Programming, Java, World, Hello]

5. Write a Java program that calculates the sum of all even numbers present in an ArrayList of integers.

Answer:

```
import java.util.ArrayList;

public class Main {
    public static void main(String[] args) {
        ArrayList<Integer> numbers = new ArrayList<>();
        numbers.add(2);
        numbers.add(5);
        numbers.add(10);
        numbers.add(7);
        numbers.add(8);

        int sumOfEvens = calculateSumOfEvens(numbers);
        System.out.println("Sum of even numbers: " + sumOfEvens);
    }

    public static int calculateSumOfEvens(ArrayList<Integer> numbers) {
        int sum = 0;
        for (int num : numbers) {
            if (num % 2 == 0) {
                sum += num;
            }
        }
        return sum;
    }
}
```

Output:

Sum of even numbers: 20