

# Guided LAB - 303.11.3 - ArrayList of User-Defined Objects

## Introduction

Since ArrayList supports generics, you can create an ArrayList of any data type. It can be of simple types such as Integer, String, or Double, or complex types such as an ArrayList of ArrayLists, an ArrayList of HashMaps, or an ArrayList of any user-defined objects.

## Lab Objective

In the following lab, you will learn how to create an ArrayList of user-defined objects. We will utilize ArrayList, constructors, getters, and setters. This concept is very important for future lectures such as DAO, Hibernate, and Spring Boot.

By the end of this lab, learners will be able to utilize the ArrayList of user-defined objects.

## Instructions

**Step 1:** Create a new Java project and create a new Class named “**Book**,” and then add the code below in the **Book** class.

```
public class Book {
    private int number;
    private String name;
    private String author;
    private String category;
    // Constructor with arguments
    public Book(int number, String name, String author, String category)
    {
        this.name = name;
        this.category = category;
    }
}
```

```
    this.author = author;
    this.number = number;
}
// Constructor without arguments
public Book()
{

}
public int getNumber() {
    return number;
}
public void setNumber(int number) {
    this.number = number;
}
public String getName() {
    return name;
}
public void setName(String name1) {
    this.name = name1;
}
public String getAuthor() {
    return author;
}
public void setAuthor(String author) {
    this.author = author;
}
public String getCategory() {
    return category;
}
public void setCategory(String category) {
    this.category = category;
}
}
```

The above is actually a POJO class for setter and getter.

**Step 2:** Create a new Class named “*AddDataToArrayList*,” and add the code below in the *AddDataToArrayList* class.

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

public class AddDataToArrayList {
    public ArrayList<Book> bookdetails() {
        //User-defined class objects in Java ArrayList

        ArrayList<Book> list = new ArrayList<Book>();
        // Passing data using Constructors
        Book b1 = new Book(1, "Death note", "John", "cartoon");
        Book b2 = new Book(2, "Stranger Things", "brothers", "suspense");
        Book b3 = new Book(3, "Spider man", "Alex", "Kids");
        Book b4 = new Book(4, "GentleMen", "Max", "Action");
        // Passing data using setter
        Book b5 = new Book();
        b5.setNumber(5);
        b5.setName("Java FullStack");
        b5.setAuthor("Flex");
        b5.setCategory("Programming");
        // Adding Books objects to Arraylist
        list.add(b1);
        list.add(b2);
        list.add(b3);
        list.add(b4);
        list.add(b5);
        return list;
    }
}
```

In the above class, as a demonstration, we are passing Data to Book class by using the **constructor**, and by using the **setter** method.

**Step 3:** Create a new Class named “*showData,*” and add the code below in the *showData* class.

```
import java.util.ArrayList;
import java.util.Iterator;
public class showData {
    public static void main(String[] args) {
        // instantiation to class AddDataToArrayList
        AddDataToArrayList b = new AddDataToArrayList();
        ArrayList<Book> mybooklist = b.bookdetails();
        for(Book showValue: mybooklist)
        {
            // ---- invoking getter method for getting Data-----
            System.out.println(showValue.getNumber() + " " + showValue.getName() + " "+
            showValue.getCategory() + " "+ showValue.getAuthor());
        }
    }
}
```

### Output:

```
1 Death note cartoon John
2 Stranger Things suspense brothers
3 Spider man Kids Alex
4 GentleMen Action Max
5 Java FullStack Programming Flex
```

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**Submission Instructions:**

Include the following deliverables in your submission -

- Submit your source code using the Start Assignment button in the top-right corner of the assignment page in Canvas.

**CANVAS STAFF USE ONLY: Canvas Submission Guideline:**

Instructions for Canvas Assignment Creation
<p><b>Assignment Name:</b> GLAB - 303.11.3 - ArrayList of User-Defined Objects</p> <p><b>Points:</b> 100</p> <p><b>Assignment Group:</b> Module 303: Java SE Review (Not Graded)</p> <p><b>Display Grade As:</b> Complete/Incomplete</p> <p><b>Do not count this assignment towards the final grade:</b> Checked</p> <p><b>Submission Types:</b> Files Uploads</p> <p>Everything else is the default.</p>