LAPORAN PRAKTIKUM CODELAB PBO 2A MODUL 4

INFORMATIKA

Universitas Muhammadiyah Malang

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Kelas: PBO

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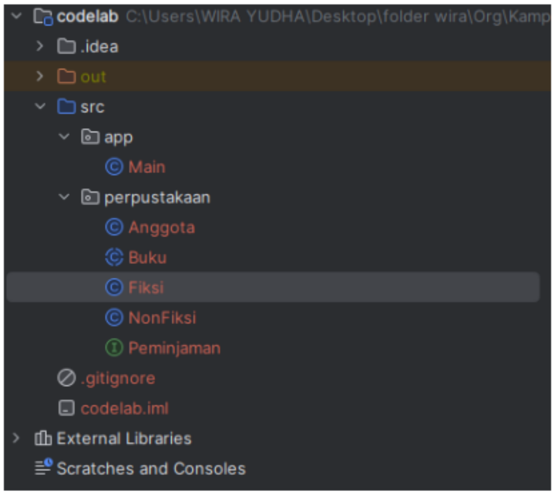
Codelab

CODELAB

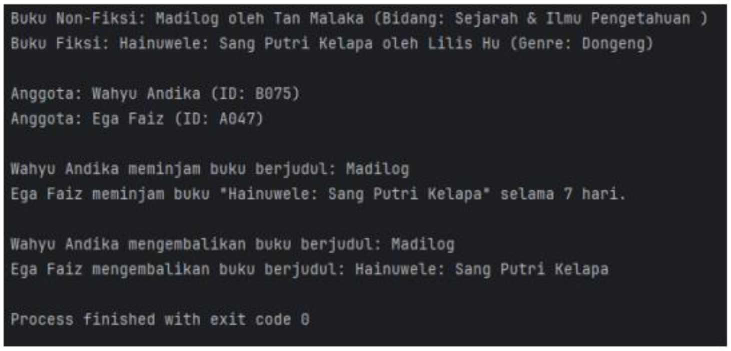
Create a simple library management system that applies the basic concepts of object-oriented programming in Java, namely **Package, Polymorphism, Overloading, Interface, and Abstraction.**

1. All classes must be stored in a library package (except for **Main.java**). Here is the folder structure:



```
codelab C:\Users\WIRA YUDHA\Desktop\folder wira\Org\Kamp
  .idea
  out
  src
    app
      Main
    perpustakaan
      Anggota
      Buku
      Fiksi
      NonFiksi
      Peminjaman
  .gitignore
  codelab.iml
External Libraries
Scratches and Consoles
```

2. The **Book** class must be created as an **abstract** class with the attributes **title** and **author**, and have an abstract method **displayInfo()**.
3. The **Book** class must have two subclasses: **Fiction** and **NonFiction**, where each subclass implements the **displayInfo()** method in a different way.
4. Create a **BookLoan** interface that has two methods: **borrowBook()** and **returnBook()**. The **Member** class must implement this interface to print the **loan** or **return** information.
5. In the **Member** class, create a method called **borrowBook()** that has two versions, one that accepts a parameter in the form of a **book title**, and another that accepts parameters in the form of a **title** and **loan duration**. Then create two attributes, namely:
   - **String:** name
   - **String:** memberID
6. Expected output example:

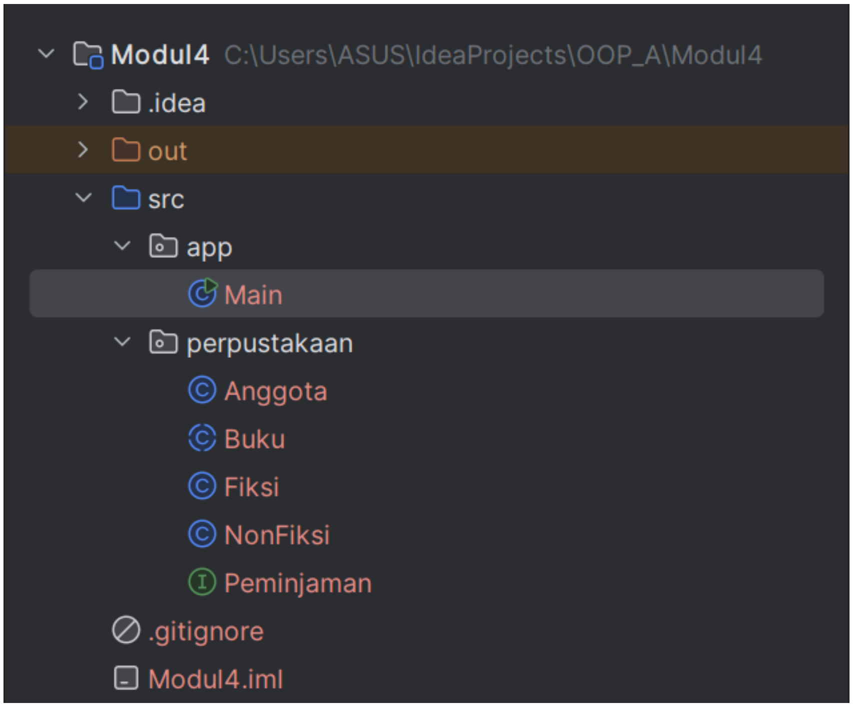


```
Buku Non-Fiksi: Madilog oleh Tan Malaka (Bidang: Sejarah & Ilmu Pengetahuan )
Buku Fiksi: Hainuwele: Sang Putri Kelapa oleh Lilis Hu (Genre: Dongeng)

Anggota: Wahyu Andika (ID: B075)
Anggota: Ega Faiz (ID: A047)

Wahyu Andika meminjam buku berjudul: Madilog
Ega Faiz meminjam buku "Hainuwele: Sang Putri Kelapa" selama 7 hari.

Wahyu Andika mengembalikan buku berjudul: Madilog
Ega Faiz mengembalikan buku berjudul: Hainuwele: Sang Putri Kelapa

Process finished with exit code 0
```

7. Note:
   - **idAnggota** is your **class** and the last **3 digits of your student ID number** and your friends'.
   - **Name** use your **name** and **your friends**' names

First :

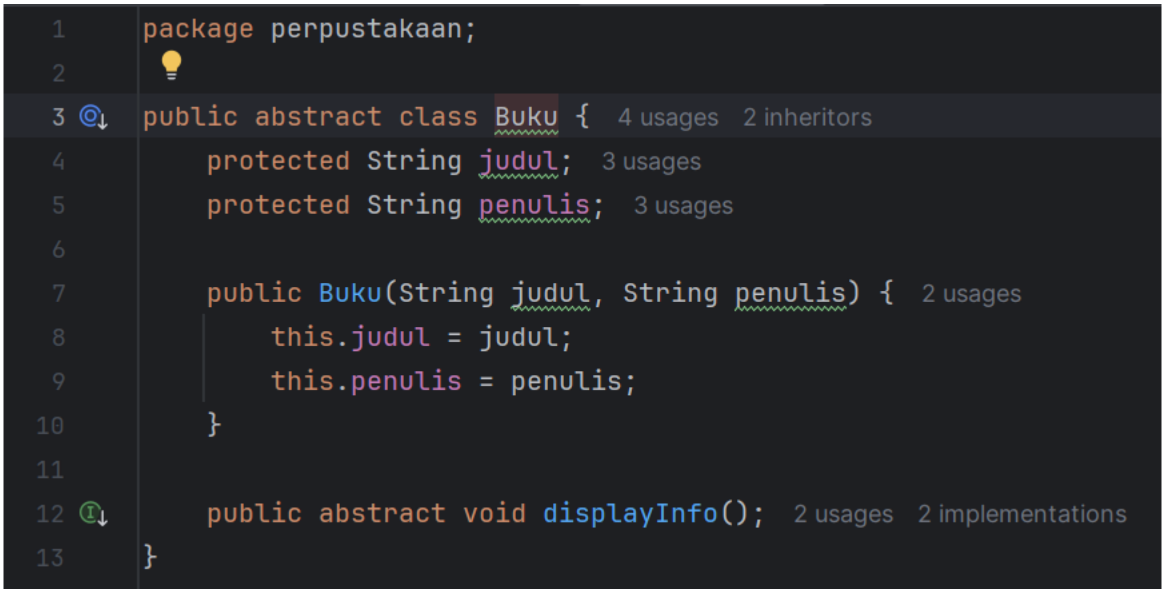
The project is divided into packages to promote modularity and maintainability. The primary packages and classes are:



```
Modul4  C:\Users\ASUS\IdeaProjects\OOP_A\Modul4
  .idea
  out
  src
    app
      Main
    perpustakaan
      Anggota
      Buku
      Fiksi
      NonFiksi
      Peminjaman
  .gitignore
  Modul4.iml
```

Make the Abstraction Class:

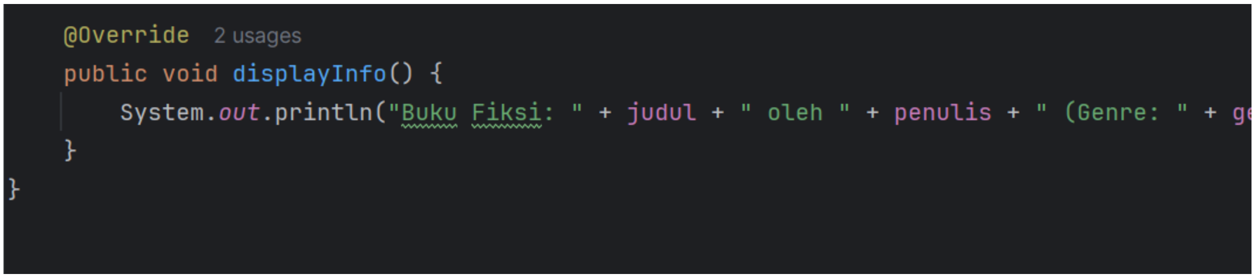
The abstract class Buku defines a template for all books with common attributes (judul, penulis) and an abstract method displayInfo(), which is implemented differently by its subclasses.



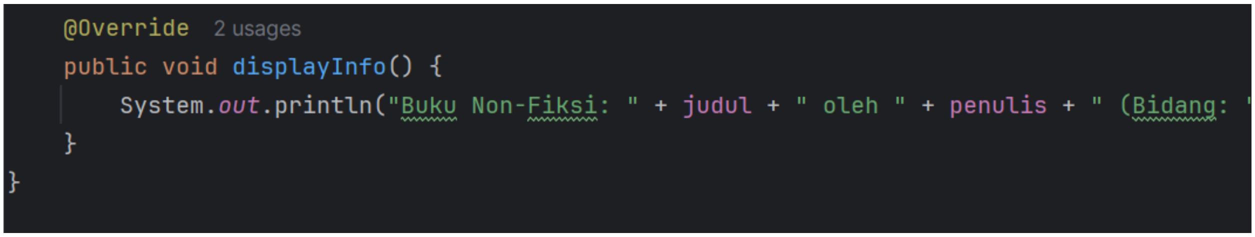
```java
package perpustakaan;

public abstract class Buku {
    protected String judul;
    protected String penulis;

    public Buku(String judul, String penulis) {
        this.judul = judul;
        this.penulis = penulis;
    }

    public abstract void displayInfo();
}
```

Make Polymorphism in Fiksi and NonFiksi class :

Polymorphism is demonstrated by having Fiksi and NonFiksi extend the Buku class and override the displayInfo() method with specific information based on the book type.



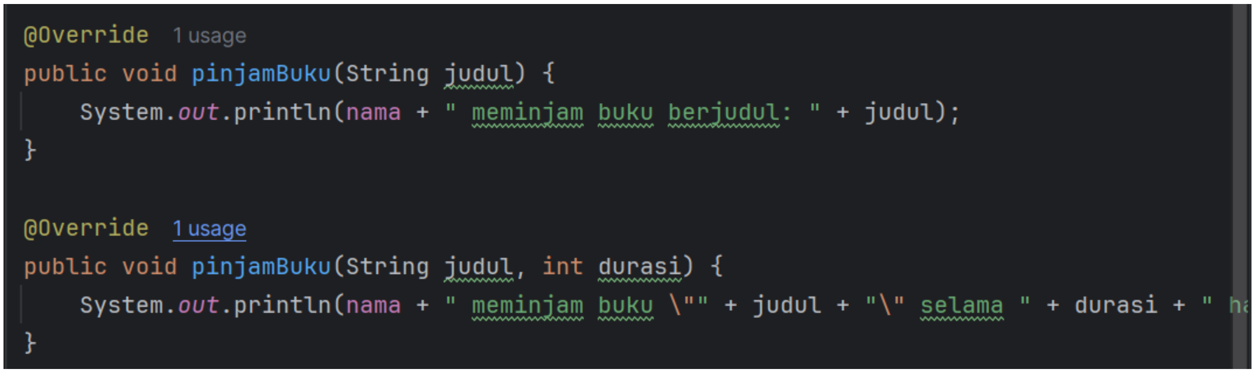
```
    @Override  2 usages
    public void displayInfo() {
        System.out.println("Buku Fiksi: " + judul + " oleh " + penulis + " (Genre: " + ge
    }
}
```



```
    @Override  2 usages
    public void displayInfo() {
        System.out.println("Buku Non-Fiksi: " + judul + " oleh " + penulis + " (Bidang: '
    }
}
```

Make Overloading in Anggota class:

The class Anggota implements method overloading in the pinjamBuku() method:

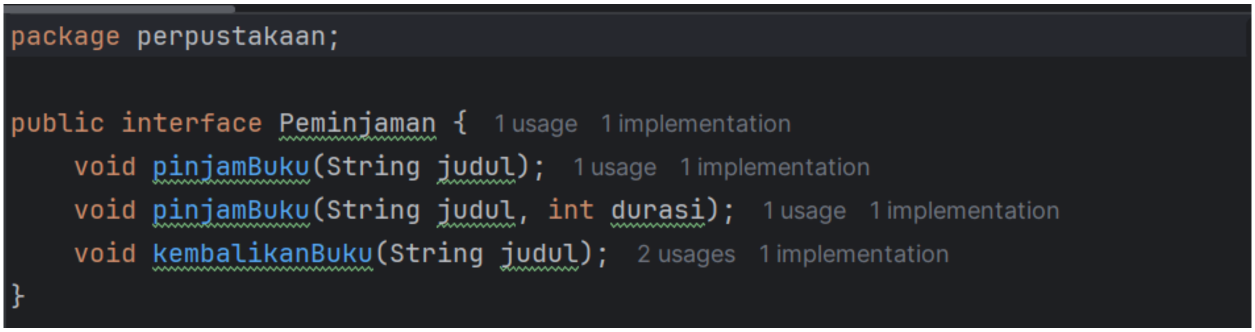


```
@Override  1 usage
public void pinjamBuku(String judul) {
    System.out.println(nama + " meminjam buku berjudul: " + judul);
}

@Override  1 usage
public void pinjamBuku(String judul, int durasi) {
    System.out.println(nama + " meminjam buku \"" + judul + "\" selama " + durasi + " ha
}
```

These two methods allow a member to borrow a book with or without specifying the loan duration.

Making an Interface:

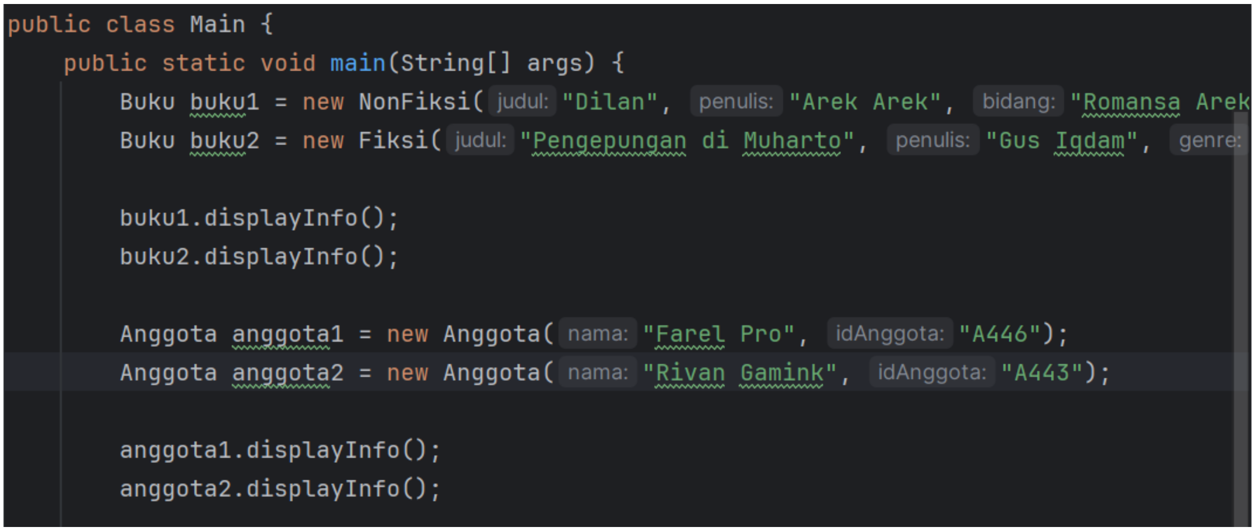
An interface Peminjaman is created to define the contract for borrowing and returning books. The class Anggota implements this interface.



```
package perpustakaan;

public interface Peminjaman {  1 usage   1 implementation
    void pinjamBuku(String judul);  1 usage   1 implementation
    void pinjamBuku(String judul, int durasi);  1 usage   1 implementation
    void kembalikanBuku(String judul);  2 usages   1 implementation
}
```

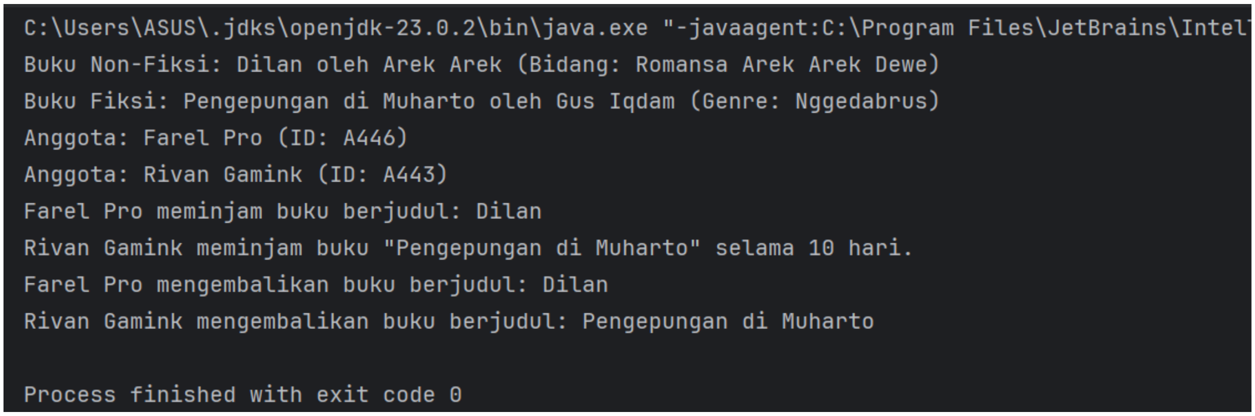
Output Section:

The Main class demonstrates the use of the entire system by creating book and member objects and calling their methods:



```
public class Main {
    public static void main(String[] args) {
        Buku buku1 = new NonFiksi( judul: "Dilan",  penulis: "Arek Arek",  bidang: "Romansa Arek
        Buku buku2 = new Fiksi( judul: "Pengepungan di Muharto",  penulis: "Gus Iqdam",  genre:

        buku1.displayInfo();
        buku2.displayInfo();

        Anggota anggota1 = new Anggota( nama: "Farel Pro",  idAnggota: "A446");
        Anggota anggota2 = new Anggota( nama: "Rivan Gamink",  idAnggota: "A443");

        anggota1.displayInfo();
        anggota2.displayInfo();
```

Output Example if we run it :



```
C:\Users\ASUS\.jdks\openjdk-23.0.2\bin\java.exe "-javaagent:C:\Program Files\JetBrains\Intel
Buku Non-Fiksi: Dilan oleh Arek Arek (Bidang: Romansa Arek Arek Dewe)
Buku Fiksi: Pengepungan di Muharto oleh Gus Iqdam (Genre: Nggedabrus)
Anggota: Farel Pro (ID: A446)
Anggota: Rivan Gamink (ID: A443)
Farel Pro meminjam buku berjudul: Dilan
Rivan Gamink meminjam buku "Pengepungan di Muharto" selama 10 hari.
Farel Pro mengembalikan buku berjudul: Dilan
Rivan Gamink mengembalikan buku berjudul: Pengepungan di Muharto

Process finished with exit code 0
```