

MANAJEMEN KONFIGURASI DAN EVOLUSI PERANGKAT LUNAK

Tugas W04 - Praktikum Refactoring



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PROGRAM STUDI S1 SOFTWARE ENGINEERING

FAKULTAS INFORMATIKA

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1. Identifikasi Bed Smell yang ada pada Class

- a. **God Class:** Song menangani terlalu banyak hal, termasuk informasi lagu, album, artis, dan genre dalam satu class.
- b. **Magic Number:** Genre lagu direpresentasikan dengan angka (1, 2, 3, dll.), sehingga sulit dipahami tanpa referensi tambahan.
- c. **Long Method:** Metode seperti printInfo(int detailLevel) terlalu panjang dan mencampur berbagai jenis informasi dalam satu fungsi.
- d. **Feature Envy:** Song memiliki atribut dan metode yang lebih berhubungan dengan Artist dan Album, sehingga terjadi ketergantungan tinggi.

2. Refactoring terhadap class Song.Java

a. Memisahkan Class untuk refactoring.

- Membuat Class Artist untuk menyimpan informasi artis.
- Membuat Class Album untuk menyimpan informasi album.
- Menggunakan Enum Genre sebagai pengganti angka dalam merepresentasikan genre.

b. Mengimplementasikan Class baru.

- **Artist.Java**

```
Assignment > J Artist.java > ...
1  package Assignment;
2
3  public class Artist {
4      private String name;
5      private String alias;
6      private String imageURL;
7
8      public Artist(String name, String alias, String imageURL) {
9          this.name = name;
10         this.alias = alias;
11         this.imageURL = imageURL;
12     }
13
14     public String getName() {
15         return name;
16     }
17
18     public String getAlias() {
19         return alias;
20     }
21
22     public String getImageURL() {
23         return imageURL;
24     }
25 }
```

- Album.java

```
ment > J Album.java > Album > getName()
package Assignment;

public class Album {
    private String name;
    private String coverURL;

    public Album(String name, String coverURL) {
        this.name = name;
        this.coverURL = coverURL;
    }

    public String getName() {
        return name;
    }

    public String getCoverURL() {
        return coverURL;
    }
}
```

- Enum Genre.java

```
ment > J Genre.java > Genre
package Assignment;

public enum Genre {
    UNDEFINED, POP, ROCK, HIPHOP, RNB, JAZZ, INSTRUMENTALS, CLOWNCORE
}
```

c. Perubahan di Class Song.java.

```
Assignment > J Song.java > Song > id
1  package Assignment;
2
3  public class Song {
4      private String id;
5      private String title;
6      private String releaseYear;
7      private String musicFileURL;
8      private Genre genre;
9      private Album album;
10     private Artist artist;
11
12     public Song(String id, String title, String releaseYear, String musicFileURL) {
13         this.id = id;
14         this.title = title;
15         this.releaseYear = releaseYear;
16         this.musicFileURL = musicFileURL;
17         this.genre = Genre.UNDEFINED;
18     }
19
20     public void setAlbum(Album album) {
21         this.album = album;
22     }
23
24     public void setArtist(Artist artist) {
25         this.artist = artist;
26     }
27
28     public void setGenre(Genre genre) {
29         this.genre = genre;
30     }
31
32     public void printInfo() {
33         System.out.println("Song title: " + title);
34         System.out.println("Release year: " + releaseYear);
35         System.out.println("Genre: " + genre);
36         if (artist != null) {
37             System.out.println("Artist: " + artist.getName() + " (aka " + artist.getAlias() + ")");
38         }
39         if (album != null) {
40             System.out.println("Album: " + album.getName());
41         }
42     }
43 }
```

d. Pembuatan Class Main.Java untuk melakukan testing.

```
Assignment > J Main.java > ...
1 package Assignment;
2
3 public class Main {
4     Run | Debug
5     public static void main(String[] args) {
6         Song song = new Song(id:"1", title:"Bohemian Rhapsody", releaseYear:"1975", musicFileURL:"bohemian.mp3");
7         song.setGenre(Genre.ROCK);
8
9         Album album = new Album(name:"A Night at the Opera", coverURL:"cover.jpg");
10        song.setAlbum(album);
11
12        Artist artist = new Artist(name:"Queen", alias:"Freddie Mercury", imageURL:"queen.jpg");
13        song.setArtist(artist);
14
15        song.printInfo();
16    }
17 }
```

e. Melakukan uji kode

Setelah melakukan proses refactoring, jalankan program dengan perintah berikut:

- Melakukan kompilasi semua class file:
“javac Assignment/*.java”
- Jalankan program dengan perintah:
“java Assignment.Main”
- Output berhasil:

```
PS D:\MKEPL_Praktikum-Refactoring\song_refactor\sourcecode> javac Assignment/*.java
PS D:\MKEPL_Praktikum-Refactoring\song_refactor\sourcecode> java Assignment.Main
Song title: Bohemian Rhapsody
Release year: 1975
Genre: ROCK
Artist: Queen (aka Freddie Mercury)
Album: A Night at the Opera
PS D:\MKEPL_Praktikum-Refactoring\song_refactor\sourcecode> |
```

3. Link GitHub:

https://github.com/DevrinAnggun/MKEPL_Praktikum-Refactoring/tree/main/song_refactor/sourcecode/Assignment