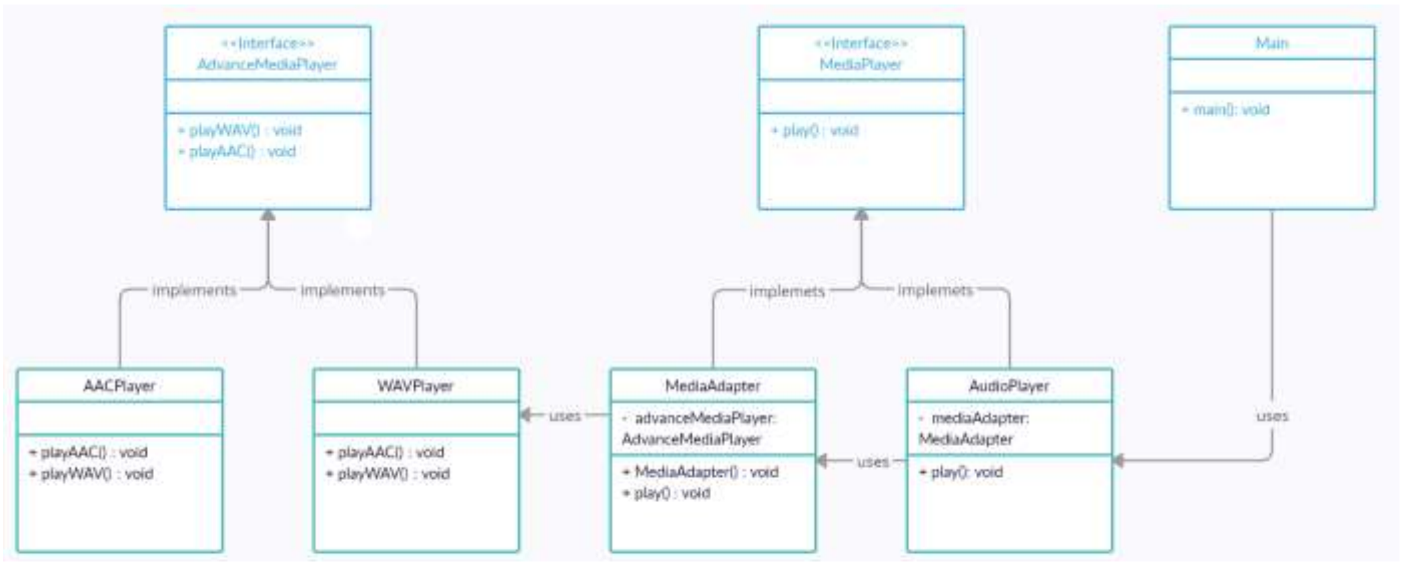
Assignment 7: Adapter Design Pattern

What is Adapter Design Pattern?

Adapter is a structural design pattern that allows objects with incompatible interfaces to collaborate.

Structure (Class Diagram)



A Car has an audio player. It plays a different types of audio files. To play those we need an **Adapter Class** to convert those files to mp3 file and play the audio. I have created a program which supports only **“.mp3”, “.aac” & “.wav”** formats. If any other file format is used then the code gives a message that the **“File format is not supported”**.

Implementation (Code)

```
interface MediaPlayer {
    public void play(String audioType ,String fileName);
}

interface AdvanceMediaPlayer {
    public void playAAC(String audioType, String fileName);
    public void playWAV(String audioType, String fileName);
}

class AACPlayer implements AdvanceMediaPlayer {
    public void playAAC(String audioType, String fileName) {
        System.out.println("Playing " + fileName + "." + audioType);
    }
    public void playWAV(String audioType, String fileName) {
        // Do Nothing
    }
}
```

```
class WAVPlayer implements AdvanceMediaPlayer {
    public void playAAC(String audioType, String fileName) {
        // Do Nothing
    }
    public void playWAV(String audioType, String fileName) {
        System.out.println("Playing " + fileName + "." + audioType);
    }
}

class MediaAdapter implements MediaPlayer {
    AdvanceMediaPlayer advMusicPlay;

    public MediaAdapter(String audioType){
        if (audioType.equalsIgnoreCase("aac")) {
            advMusicPlay = new AACPlayer();
        } else if (audioType.equalsIgnoreCase("wav")) {
            advMusicPlay = new WAVPlayer();
        }
    }

    public void play (String audioType, String fileName) {
        if (audioType.equalsIgnoreCase("aac")) {
            advMusicPlay.playAAC(audioType, fileName);
        } else if (audioType.equalsIgnoreCase("wav")) {
            advMusicPlay.playWAV(audioType, fileName);
        }
    }
}

class AudioPlayer implements MediaPlayer {
    MediaAdapter mediaAdapter;

    public void play(String audioType, String fileName) {
        if (audioType.equalsIgnoreCase("mp3")) {
            System.out.println("Playing " + fileName + "." + audioType);
        }
        else if (audioType.equalsIgnoreCase("aac") ||
audioType.equalsIgnoreCase("wav")) {
            mediaAdapter = new MediaAdapter(audioType);
            mediaAdapter.play(audioType, fileName);
        }
        else {
            System.out.println("Sorry! '" + audioType + "' format not
supported");
        }
    }
}
```

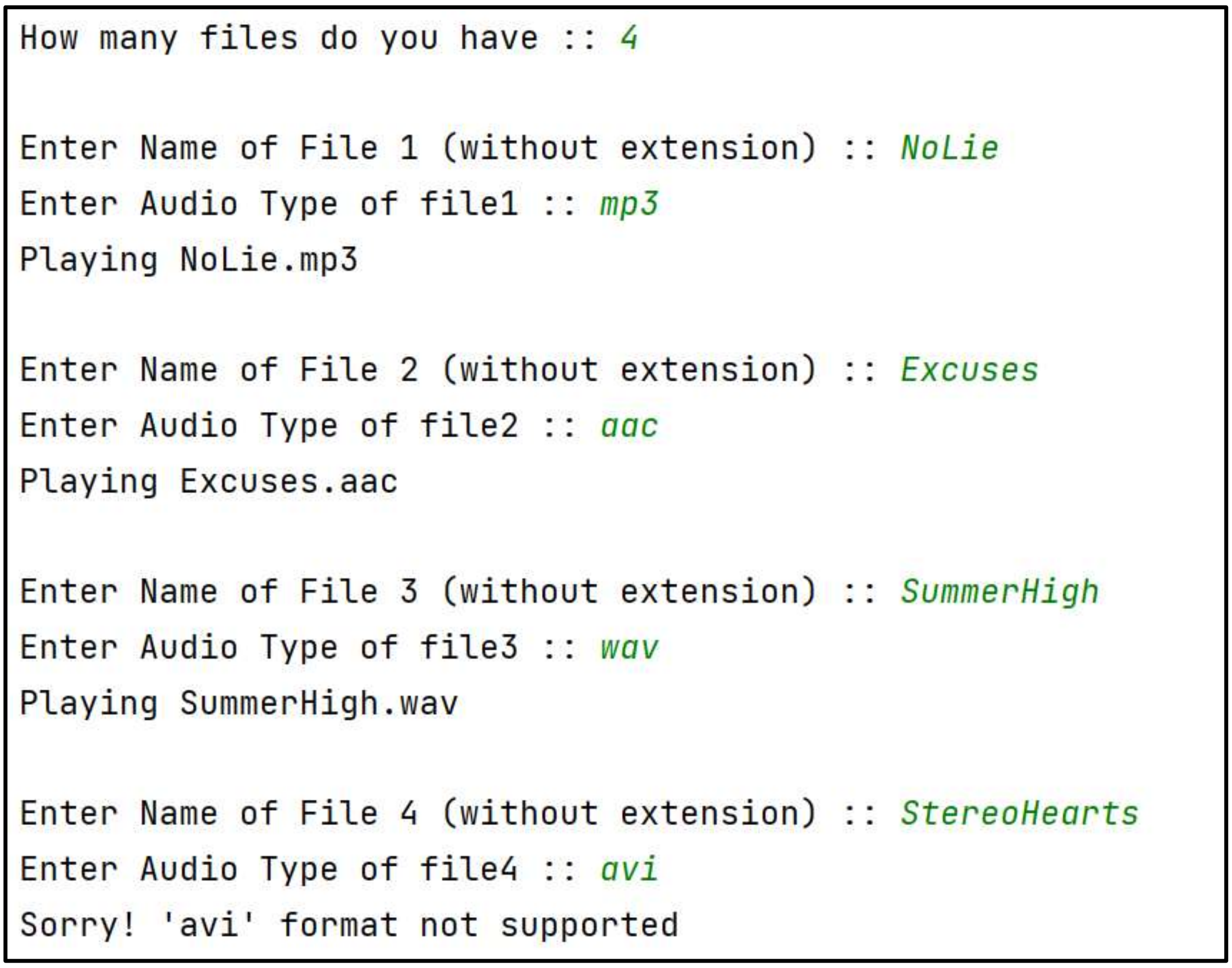
```java
public class Main {
    public static void main(String[] args) {
        AudioPlayer audioPlayer = new AudioPlayer();
        Scanner sc = new Scanner(System.in);

        System.out.print("How many files do you have :: ");
        int n = sc.nextInt();

        for (int i=1 ; i<=n ; i++) {
            System.out.print("\nEnter Name of File " + i + " (without extension)
:: ");
            String fileName = sc.next();
            System.out.print("Enter Audio Type of file" + i + " :: ");
            String audioType = sc.next();

            audioPlayer.play(audioType, fileName);
        }
    }
}
```

Output



```
How many files do you have :: 4

Enter Name of File 1 (without extension) :: NoLie
Enter Audio Type of file1 :: mp3
Playing NoLie.mp3

Enter Name of File 2 (without extension) :: Excuses
Enter Audio Type of file2 :: aac
Playing Excuses.aac

Enter Name of File 3 (without extension) :: SummerHigh
Enter Audio Type of file3 :: wav
Playing SummerHigh.wav

Enter Name of File 4 (without extension) :: StereoHearts
Enter Audio Type of file4 :: avi
Sorry! 'avi' format not supported
```

Applicability

1. **Use the Adapter class when you want to use some existing class, but its interface isn't compatible with the rest of your code.**
   The Adapter pattern lets you create a middle-layer class that serves as a translator between your code and a legacy class, a 3rd-party class or any other class with a weird interface.

2. **Use the pattern when you want to reuse several existing subclasses that lack some common functionality that can't be added to the superclass.**
   You could extend each subclass and put the missing functionality into new child classes. However, you'll need to duplicate the code across all of these new classes.