Class TV_Program

```java
public class TV_Program {

	private double audienceRate;

	public TV_Program(double audienceRate) {
		this.audienceRate = audienceRate;
	}
	public TV_Program(TV_Program tvP){
		this.audienceRate = tvP.audienceRate;
	}
	public double getAudienceRate() {
		return audienceRate;
	}
	public void display(){
		System.out.println("Audience Rate: " + audienceRate);
	}
}
```

Interface Viewable

```
public interface Viewable {

	public abstract void display();
}
```

Class TV_Channel

```
public abstract class TV_Channel implements Viewable{

	private int views;
	private boolean live;
	protected TV_Program [] arProg;
	protected int nbProg;

	public TV_Channel(int views, boolean live) {
		this.views = views;
		this.live = live;
		arProg = new TV_Program[20];
		nbProg = 0;
	}
	public int getViews() {
		return views;
	}
	public boolean isLive() {
		return live;
	}

	public abstract double calculateRatings();

	public void display(){
		System.out.println("Views: " + views + "\nLive: " + live);
		System.out.println("TV Programs: ");
		for(int i = 0; i < nbProg; i++){
			arProg[i].display();
		}
	}
}
```

Class Sports

```
public class Sports extends TV_Channel{

	private int nbMatches;

	public Sports(int views, boolean live, int nbMatches) {
		super(views, live);
		this.nbMatches = nbMatches;
	}
	public int getNbMatches() {
		return nbMatches;
	}
	public double calculateRatings(){
		if(nbMatches == 0) return -1;
		return getViews() / nbMatches * 1.5;
	}
	@Override
	public void display(){
		super.display();
		System.out.println("Number of matches: " + nbMatches);
	}
}
```

Class News

```
public class News extends TV_Channel{
	private int newsSegments;
	private int breakingNews;
public News(int views, boolean live, int newsSegments, int breakingNews) {
		super(views, live);
		this.newsSegments = newsSegments;
		this.breakingNews = breakingNews;
	}
	public int getBreakingNews() { return breakingNews; }
	public double calculateRatings(){
		if(breakingNews == 0 || nbProg == 0) return -1;
		double sum = 0;
		for(int i = 0; i < nbProg; i++)
			sum += arProg[i].getAudienceRate();
		return getViews()/breakingNews + sum/nbProg;
	}
	@Override
	public void display(){
		super.display();
		System.out.println("News Segments: " + newsSegments);
		System.out.println("Breaking News: " + breakingNews);
	}
}
```