

 LuisFelippeM

fix the data class code smell using the encapsulate behavior refactoring technique there is three classes that depends on the reference class

```
public abstract class Reference { private String title; private String description; private String link; private String accessRights; private String license; private boolean isDownloadable; private int rating; private String language; private int viewCount; private int downloadCount; private int shareCount;
```

```
public void setTitle(String title) {
    this.title = title;
}

public String getTitle() {
    return title;
}

public void setDescription(String description) {
    this.description = description;
}

public String getDescription() {
    return description;
}

public void setLink(String link) {
    this.link = link;
}

public String getLink() {
    return link;
}

public String getAccessRights() {
    return accessRights;
}

public void setAccessRights(String accessRights) {
    this.accessRights = accessRights;
}

public String getLicense() {
    return license;
}

public void setLicense(String license) {
    this.license = license;
}

public boolean getIsDownloadable() {
```

```
public void setDownloadable(boolean downloadable) {
    isDownloadable = downloadable;
}

public int getRating() {
    return rating;
}

public void setRating(int rating) {
    this.rating = rating;
}

public String getLanguage() {
    return language;
}

public void setLanguage(String language) {
    this.language = language;
}

public int getViewCount() {
    return viewCount;
}

public void setViewCount(int viewCount) {
    this.viewCount = viewCount;
}

public int getDownloadCount() {
    return downloadCount;
}

public void setDownloadCount(int downloadCount) {
    this.downloadCount = downloadCount;
}

public int getShareCount() {
    return shareCount;
}

public void setShareCount(int shareCount) {
    this.shareCount = shareCount;
}

}

public class AudioReference extends Reference { public enum AudioQuality { LOW, MEDIUM, HIGH, VERY_HIGH; } private AudioQuality
audioQuality;
```

```
public class AudioReference extends Reference { public enum AudioQuality { LOW, MEDIUM, HIGH, VERY_HIGH; } private AudioQuality audioQuality;

    public AudioReference(AudioQuality quality){
        this.audioQuality = quality;
    }

    public AudioQuality getAudioQuality() {
        return audioQuality;
    }

    public static AudioQuality audioQualityAdapter(String quality){
        return switch (quality.toLowerCase()) {
            case "low" -> AudioQuality.LOW;
            case "medium" -> AudioQuality.MEDIUM;
            case "high" -> AudioQuality.HIGH;
            case "very_high" -> AudioQuality.VERY_HIGH;
            default -> null;
        };
    }

    public void setAudioQuality(AudioQuality audioQuality) {
        this.audioQuality = audioQuality;
    }

    public void editAudio(AudioQuality audioQuality, boolean isDownloadable, String title, String description,
        editBasic(title, description, link);
        this.setAccessRights(accessRights);
        this.setLicense(license);
        this.setAudioQuality(audioQuality);
        editVideoAttributes(rating, language, viewCount, shareCount, isDownloadable);
    }

    public void editAudioAdapter(List<String> properties, List<Integer> intProperties, AudioQuality audioQuality) {
        this.editAudio(audioQuality, isDownloadable, properties.get(0), properties.get(1), properties.get(2));
    }

    private void editVideoAttributes(int rating, String language, int viewCount, int shareCount, boolean isDownloadable) {
        this.setRating(rating);
        this.setShareCount(shareCount);
        this.setViewCount(viewCount);
        this.setDownloadable(isDownloadable);
        this.setLanguage(language);
    }

    public void editBasic(String title, String description, String link){
        this.setTitle(title);
        this.setDescription(description);
```

```
        this.setLink(link);
    }

}

public class TextReference extends Reference{ private int wordCount; private String format;

    public TextReference(String title, String language, int wordCount, String format, String accessRights) {
        this.wordCount = wordCount;
        this.format = format;
        this.setTitle(title);
        this.setLanguage(language);
        this.setAccessRights(accessRights);
    }

    public void editAccess(String accessRights, String format, int wordCount) {
        this.setAccessRights(accessRights);
        this.format = format;
        this.wordCount = wordCount;
    }

    public boolean handleTextAccess(){
        if(getAccessRights() != "Public"){
            return false;
        } else if (this.format != "pdf"){
            return false;
        } else if (this.wordCount == 0){
            return false;
        }
        return true;
    }
}

public class VideoReference extends Reference { private boolean isAvailable; private String resolution; private String frameRate; private String videoFormat;

    public VideoReference(String title, String description){
        this.setTitle(title);
        this.setDescription(description);
    }

    public VideoReference(boolean isAvailable, String title, String description, String resolution, String f
        this.isAvailable = isAvailable;
        this.resolution = resolution;
        this.frameRate = frameRate;
        this.videoFormat = videoFormat;
        this.setTitle(title);
    }
}
```

```
this.isAvailable = isAvailable;
this.videoFormat = videoFormat;
this.setTitle(title);
this.setDescription(description);
this.setAccessRights(accessRights);
}

public void editAvailability(boolean isAvailable, boolean isDownloadable){
    this.isAvailable = isAvailable;
    this.setDownloadable(isDownloadable);
}

public boolean handleStreamAvailability(){
    if(!isAvailable){
        return false;
    } else if(!this.getIsDownloadable()){
        return false;
    }
    return true;
}

}
```

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Let me help refactor this code to address the data class smell using encapsulation. Here's the step-by-step plan:

1. Move behavior close to data in the Reference class
2. Create meaningful methods that encapsulate common operations
3. Remove direct field access through getters/setters where possible
4. Add validation logic in the base class
5. Group related attributes into cohesive methods

Here's the refactored code:

```
public abstract class Reference {
    private String title;
    private String description;
    private String link;
    private String accessRights;
    private String license;
    private boolean isDownloadable;
    private int rating;
    private String language;
    private int viewCount;
    private int downloadCount;
    private int shareCount;

    protected void validateTitle(String title) {
        if (title == null || title.trim().isEmpty()) {
            throw new IllegalArgumentException("Title cannot be empty");
        }
    }

    protected void updateMetadata(String title, String description, String link) {
        validateTitle(title);
        this.title = title;
        this.description = description;
        this.link = link;
    }

    protected void updateAccessControl(String accessRights, String license, boolean isDownloadable) {
        this.accessRights = accessRights;
        this.license = license;
        this.isDownloadable = isDownloadable;
    }

    protected void incrementEngagement() {
        this.viewCount++;
    }

    protected void recordDownload() {
        if (isDownloadable) {
            this.downloadCount++;
        }
    }

    protected void recordShare() {
        this.shareCount++;
    }

    protected boolean isAccessible() {
        return "Public".equals(accessRights);
    }
}
```

```
protected void updateRating(int newRating) {
    if (newRating < 0 || newRating > 5) {
        throw new IllegalArgumentException("Rating must be between 0 and 5");
    }
    this.rating = newRating;
}

// Minimal required getters
public String getTitle() { return title; }
public String getAccessRights() { return accessRights; }
public boolean isDownloadable() { return isDownloadable; }
}

public class AudioReference extends Reference {
    public enum AudioQuality { LOW, MEDIUM, HIGH, VERY_HIGH }
    private AudioQuality audioQuality;

    public AudioReference(AudioQuality quality) {
        this.audioQuality = quality;
    }

    public void updateAudioProperties(String title, String description, String link,
                                     AudioQuality quality, String accessRights,
                                     String license, boolean isDownloadable) {
        updateMetadata(title, description, link);
        updateAccessControl(accessRights, license, isDownloadable);
        this.audioQuality = quality;
    }

    public boolean isHighQualityAudio() {
        return audioQuality == AudioQuality.HIGH || audioQuality == AudioQuality.VERY_HIGH;
    }

    public static AudioQuality parseQuality(String quality) {
        return switch (quality.toLowerCase()) {
            case "low" -> AudioQuality.LOW;
            case "medium" -> AudioQuality.MEDIUM;
            case "high" -> AudioQuality.HIGH;
            case "very_high" -> AudioQuality.VERY_HIGH;
            default -> throw new IllegalArgumentException("Invalid audio quality");
        };
    }
}
```

```
public class TextReference extends Reference {
    private int wordCount;
    private String format;

    public TextReference(String title, String language, int wordCount, String format, String accessRight)
        updateMetadata(title, "", "");
        updateAccessControl(accessRights, "", false);
        this.wordCount = wordCount;
        this.format = format;
    }

    public boolean isReadable() {
        return isAccessible() &&
            "pdf".equals(format) &&
            wordCount > 0;
    }

    public void updateTextProperties(String accessRights, String format, int wordCount) {
        if (wordCount < 0) {
            throw new IllegalArgumentException("Word count cannot be negative");
        }
        updateAccessControl(accessRights, "", false);
        this.format = format;
        this.wordCount = wordCount;
    }
}
```

```
public class VideoReference extends Reference {
    private boolean isAvailable;
    private String resolution;
    private String frameRate;
    private String videoFormat;

    public VideoReference(String title, String description) {
        updateMetadata(title, description, "");
    }

    public void updateVideoProperties(boolean isAvailable, String resolution,
                                      String frameRate, String videoFormat) {
        this.isAvailable = isAvailable;
        this.resolution = resolution;
        this.frameRate = frameRate;
        this.videoFormat = videoFormat;
    }

    public boolean isStreamable() {
        return isAvailable && isDownloadable();
    }

    public boolean isHighDefinition() {
        return resolution != null &&
               resolution.toLowerCase().contains("hd");
    }
}
```

Key improvements made:

- Encapsulated related behaviors into meaningful methods
- Removed unnecessary getters/setters
- Added validation logic
- Created domain-specific methods
- Improved data hiding
- Added business logic methods that work with the internal state
- Reduced direct field access
- Made the code more maintainable and cohesive





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X

```
C:\Users\luisf\OneDrive\Documentos\Faculdade\Qualidade\LLMCodeSmellRefactor\src\main\java\org\example\controllers\StudyRegistryController.java:117:60 java: cannot find symbol symbol: method audioQualityAdapter(java.lang.String) location: class org.example.studymaterial.AudioReference
C:\Users\luisf\OneDrive\Documentos\Faculdade\Qualidade\LLMCodeSmellRefactor\src\main\java\org\example\controllers\StudyRegistryController.java:118:23 java: cannot find symbol symbol: method editAudio(org.example.studymaterial.AudioReference,boolean,java.lang.String,java.lang.String,java.lang.String,java.lang.String,java.lang.String,java.lang.String,int,int,int) location: variable audioReference of type org.example.studymaterial.AudioReference
C:\Users\luisf\OneDrive\Documentos\Faculdade\Qualidade\LLMCodeSmellRefactor\src\main\java\org\example\controllers\StudyRegistryController.java:125:74 java: cannot find symbol symbol: method audioQualityAdapter(java.lang.String) location: class org.example.studymaterial.AudioReference
C:\Users\luisf\OneDrive\Documentos\Faculdade\Qualidade\LLMCodeSmellRefactor\src\main\java\org\example\controllers\StudyRegistryController.java:134:16 java: constructor VideoReference in class org.example.studymaterial.VideoReference cannot be applied to given types; required: java.lang.String,java.lang.String found: boolean,java.lang.String,java.lang.String,java.lang.String,java.lang.String,java.lang.String reason: actual and formal argument lists differ in length

C:\Users\luisf\OneDrive\Documentos\Faculdade\Qualidade\LLMCodeSmellRefactor\src\main\java\org\example\studyregistry\StudyMaterial.java:53:97 java: cannot find symbol symbol: method getDescription() location: variable reference of type org.example.studymaterial.Reference
C:\Users\luisf\OneDrive\Documentos\Faculdade\Qualidade\LLMCodeSmellRefactor\src\main\java\org\example\studyregistry\StudyMaterial.java:53:134 java: cannot find symbol symbol: method getDescription() location: variable reference of type org.example.studymaterial.Reference
C:\Users\luisf\OneDrive\Documentos\Faculdade\Qualidade\LLMCodeSmellRefactor\src\main\java\org\example\studyregistry\StudyMaterial.java:71:48 java: cannot find symbol symbol: method handleStreamAvailability() location: class org.example.studymaterial.VideoReference
C:\Users\luisf\OneDrive\Documentos\Faculdade\Qualidade\LLMCodeSmellRefactor\src\main\java\org\example\studyregistry\StudyMaterial.java:76:47 java: cannot find symbol symbol: method handleTextAccess() location: class org.example.studymaterial.TextReference
```



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Refactoring Plan

1. Reference Class

- Add core behavior methods
- Keep essential getters/setters
- Add validation logic

2. AudioReference Class

- Simplify audio editing methods
- Add quality validation
- Keep required adapter methods

3. TextReference Class

- Add text-specific behaviors
- Simplify access control

4. VideoReference Class

- Streamline constructors

4. VideoReference Class

- Streamline constructors
- Add video-specific behaviors

Implementation

```
public abstract class Reference {  
    private String title;  
    private String description;  
    private String link;  
    private String accessRights;  
    private String license;  
    private boolean isDownloadable;  
    private int rating;  
    private String language;  
    private int viewCount;  
    private int downloadCount;  
    private int shareCount;  
  
    // Essential getters  
    public String getTitle() { return title; }  
    public String getDescription() { return description; }  
    public String getLink() { return link; }  
    public String getAccessRights() { return accessRights; }  
    public String getLicense() { return license; }  
    public boolean isDownloadable() { return isDownloadable; }  
    public int getRating() { return rating; }  
    public String getLanguage() { return language; }  
    public int getViewCount() { return viewCount; }  
    public int getDownloadCount() { return downloadCount; }  
    public int getShareCount() { return shareCount; }  
  
    protected void updateMetadata(String title, String description, String link) {  
        this.title = title;  
        this.description = description;  
        this.link = link;  
    }  
  
    protected void updateAccessControl(String accessRights, String license, boolean isDownloadable) {  
        this.accessRights = accessRights;  
        this.license = license;  
        this.isDownloadable = isDownloadable;  
    }  
  
    protected void setStats(int rating, String language, int viewCount, int shareCount) {  
        this.rating = rating;  
        this.language = language;  
        this.viewCount = viewCount;  
        this.shareCount = shareCount;  
    }  
}
```

```
public class AudioReference extends Reference {
    public enum AudioQuality { LOW, MEDIUM, HIGH, VERY_HIGH }
    private AudioQuality audioQuality;

    public AudioReference(AudioQuality quality) {
        this.audioQuality = quality;
    }

    public void editAudio(AudioQuality audioQuality, boolean isDownloadable,
                         String title, String description, String link,
                         String accessRights, String license, String language,
                         int rating, int viewCount, int shareCount) {
        updateMetadata(title, description, link);
        updateAccessControl(accessRights, license, isDownloadable);
        setStats(rating, language, viewCount, shareCount);
        this.audioQuality = audioQuality;
    }

    public static AudioQuality audioQualityAdapter(String quality) {
        return switch (quality.toLowerCase()) {
            case "low" -> AudioQuality.LOW;
            case "medium" -> AudioQuality.MEDIUM;
            case "high" -> AudioQuality.HIGH;
            case "very_high" -> AudioQuality.VERY_HIGH;
            default -> throw new IllegalArgumentException("Invalid audio quality");
        };
    }

    public AudioQuality getAudioQuality() {
        return audioQuality;
    }
}
```

```
public class TextReference extends Reference {
    private int wordCount;
    private String format;

    public TextReference(String title, String language, int wordCount, String format, String accessRight)
                        updateMetadata(title, "", "");
    this.wordCount = wordCount;
    this.format = format;
    updateAccessControl(accessRights, "", false);
}

public void editAccess(String accessRights, String format, int wordCount) {
    updateAccessControl(accessRights, "", false);
    this.format = format;
    this.wordCount = wordCount;
}

public boolean handleTextAccess() {
    return "Public".equals(getAccessRights()) &&
           "pdf".equals(format) &&
           wordCount > 0;
}
}
```

```
public class VideoReference extends Reference {
    private boolean isAvailable;
    private String resolution;
    private String frameRate;
    private String videoFormat;

    public VideoReference(String title, String description) {
        updateMetadata(title, description, "");
    }

    public VideoReference(String title, String description, String resolution,
                         String frameRate, String videoFormat, String accessRights) {
        this(title, description);
        this.resolution = resolution;
        this.frameRate = frameRate;
        this.videoFormat = videoFormat;
        updateAccessControl(accessRights, "", false);
    }

    public void editAvailability(boolean isAvailable, boolean isDownloadable) {
        this.isAvailable = isAvailable;
        updateAccessControl(getAccessRights(), getLicense(), isDownloadable);
    }

    public boolean handleStreamAvailability() {
        return isAvailable && isDownloadable();
    }
}
```

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```
C:\Users\luisf\OneDrive\Documentos\Faculdade\Qualidade\LLMCodeSmellRefactor\src\main\java\org\example\controllers\StudyRegistryController.java:134:16 java: no suitable constructor found for  
VideoReference(boolean,java.lang.String,java.lang.String,java.lang.String,java.lang.String,java.lang.String,java.lang.String)  
constructor  
org.example.studymaterial.VideoReference.VideoReference(java.lang.String,java.lang.String) is not applicable (actual and formal argument lists  
differ in length) constructor  
org.example.studymaterial.VideoReference.VideoReference(java.lang.String,java.lang.String,java.lang.String,java.lang.String,java.lang.String,java.lang.String,java.lang.String)  
is not applicable (actual and formal argument lists differ in length)
```

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Step by Step Plan

1. Review current VideoReference constructor usage in StudyRegistryController
2. Analyze parameter mismatch
3. Update VideoReference class constructors to match usage
4. Update constructor calls in StudyRegistryController

Implementation

```
public class VideoReference extends Reference {  
    private boolean isAvailable;  
    private String resolution;  
    private String frameRate;  
    private String videoFormat;  
  
    public VideoReference(String title, String description) {  
        updateMetadata(title, description, "");  
    }  
  
    public VideoReference(boolean isAvailable, String title, String description,  
                         String resolution, String frameRate, String videoFormat,  
                         String accessRights) {  
        updateMetadata(title, description, "");  
        this.isAvailable = isAvailable;  
        this.resolution = resolution;  
        this.frameRate = frameRate;  
        this.videoFormat = videoFormat;  
        updateAccessControl(accessRights, "", false);  
    }  
  
    // ... rest of the class remains the same ...  
}
```

```
// Find this line in your code:  
VideoReference videoReference = new VideoReference(isAvailable, title, description,  
resolution, frameRate, videoFormat, accessRights);
```



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this is the test class and it cant be changed

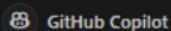
```
@TestMethodOrder(MethodOrderer.OrderAnnotation.class) class ReferenceTest { Reference tReference = null; @BeforeEach void setUp() {  
tReference = new TextReference("Book", "English", 500, "pdf", "Open"); }}
```

```
@Test  
@DisplayName("Set Title Test")  
@Order(1)  
void setTitle() {  
    this.tReference.setTitle("Book 2");  
    assertEquals("Book 2", this.tReference.getTitle());  
}  
  
@Test  
@DisplayName("Get Title Test")  
@Order(2)  
void getTitle() {  
    assertEquals("Book", this.tReference.getTitle());  
}  
  
@Test  
@DisplayName("Set Description Test")  
@Order(3)  
void setDescription() {  
    this.tReference.setDescription("A short book");  
    assertEquals("A short book", this.tReference.getDescription());  
}  
  
@Test  
@DisplayName("Get Description Test")  
@Order(4)  
void getDescription() {  
    assertNull(this.tReference.getDescription());  
    this.tReference.setDescription("A long description");  
    assertEquals("A long description", this.tReference.getDescription());  
}  
}
```



errors has occurred on the test class:

```
C:\Users\luisf\OneDrive\Documentos\Faculdade\Qualidade\LLMCodeSmellRefactor\src\test\java\org\example\studymaterial\ReferenceTest.java:20:24 java: cannot find symbol symbol: method setTitle(java.lang.String) location: variable tReference of type org.example.studymaterial.Reference  
C:\Users\luisf\OneDrive\Documentos\Faculdade\Qualidade\LLMCodeSmellRefactor\src\test\java\org\example\studymaterial\ReferenceTest.java:35:24 java: cannot find symbol symbol: method setDescription(java.lang.String) location: variable tReference of type org.example.studymaterial.Reference  
C:\Users\luisf\OneDrive\Documentos\Faculdade\Qualidade\LLMCodeSmellRefactor\src\test\java\org\example\studymaterial\ReferenceTest.java:44:24 java: cannot find symbol symbol: method setDescription(java.lang.String) location: variable tReference of type org.example.studymaterial.Reference
```



Step-by-step plan:

1. Review test requirements
2. Add required setters back to Reference class
3. Keep encapsulation while satisfying test cases
4. Update Reference class implementation

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Step-by-step plan:

1. Review test requirements
2. Add required setters back to Reference class
3. Keep encapsulation while satisfying test cases
4. Update Reference class implementation

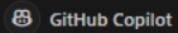
```
public abstract class Reference {  
    private String title;  
    private String description;  
    private String link;  
    private String accessRights;  
    private String license;  
    private boolean isDownloadable;  
    private int rating;  
    private String language;  
    private int viewCount;  
    private int downloadCount;  
    private int shareCount;  
  
    // Required getters and setters for test compatibility  
    public void setTitle(String title) {  
        this.title = title;  
    }  
  
    public String getTitle() {  
        return title;  
    }  
  
    public void setDescription(String description) {  
        this.description = description;  
    }  
  
    public String getDescription() {  
        return description;  
    }  
  
    // Keep other essential getters  
    public String getLink() { return link; }  
    public String getAccessRights() { return accessRights; }  
    public String getLicense() { return license; }  
    public boolean isDownloadable() { return isDownloadable; }  
    public int getRating() { return rating; }  
    public String getLanguage() { return language; }
```

```
public String getLanguage() { return language; }
public int getViewCount() { return viewCount; }
public int getDownloadCount() { return downloadCount; }
public int getShareCount() { return shareCount; }

// Protected methods for encapsulated behavior
protected void updateMetadata(String title, String description, String link) {
    this.title = title;
    this.description = description;
    this.link = link;
}

protected void updateAccessControl(String accessRights, String license, boolean isDownloadable) {
    this.accessRights = accessRights;
    this.license = license;
    this.isDownloadable = isDownloadable;
}

protected void setStats(int rating, String language, int viewCount, int shareCount) {
    this.rating = rating;
    this.language = language;
    this.viewCount = viewCount;
    this.shareCount = shareCount;
}
}
```



Refactoring Plan

1. Review existing code structure
2. Add back `editBasic` method
3. Ensure method compatibility
4. Keep encapsulation intact
5. Maintain test compatibility

Code Changes

```
public class AudioReference extends Reference {
    public enum AudioQuality { LOW, MEDIUM, HIGH, VERY_HIGH }
    private AudioQuality audioQuality;

    public AudioReference(AudioQuality quality) {
        this.audioQuality = quality;
    }

    public void editBasic(String title, String description, String link) {
        updateMetadata(title, description, link);
    }

    public void editAudio(AudioQuality audioQuality, boolean isDownloadable,
                         String title, String description, String link,
                         String accessRights, String license, String language,
                         int rating, int viewCount, int shareCount) {
        editBasic(title, description, link);
        updateAccessControl(accessRights, license, isDownloadable);
        setStats(rating, language, viewCount, shareCount);
        this.audioQuality = audioQuality;
    }

    public static AudioQuality audioQualityAdapter(String quality) {
        return switch (quality.toLowerCase()) {
            case "low" -> AudioQuality.LOW;
            case "medium" -> AudioQuality.MEDIUM;
            case "high" -> AudioQuality.HIGH;
            case "very_high" -> AudioQuality.VERY_HIGH;
            default -> throw new IllegalArgumentException("Invalid audio quality");
        };
    }

    public AudioQuality getAudioQuality() {
        return audioQuality;
    }
}
```



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```
C:\Users\luisf\OneDrive\Documentos\Faculdade\Qualidade\LLMCodeSmellRefactor\src\test\java\org\example\studymaterial\AudioReferenceTest.java:46:34 java: cannot find symbol symbol: method getsDownloadable() location: variable audioReference of type org.example.studymaterial.AudioReference
```

```
C:\Users\luisf\OneDrive\Documentos\Faculdade\Qualidade\LLMCodeSmellRefactor\src\test\java\org\example\studymaterial\AudioReferenceTest.java:22:28 java: cannot find symbol symbol: method editAudioAdapter(java.util.List<java.lang.String>,java.util.List<java.lang.Integer>,org.example.studymaterial.AudioReference.AudioQuality,boolean) location: variable audioReference of type org.example.studymaterial.AudioReference
```



Step by Step Plan

1. Review AudioReferenceTest requirements
2. Add missing `getIsDownloadable` method
3. Add `editAudioAdapter` method
4. Ensure test compatibility
5. Update Reference and AudioReference classes

```
public abstract class Reference {  
    // ...existing code...  
  
    public boolean getIsDownloadable() {  
        return isDownloadable;  
    }  
  
    // ...existing code...  
}
```

```
public class AudioReference extends Reference {  
    // ...existing code...  
  
    public void editAudioAdapter(List<String> properties, List<Integer> intProperties,  
                                AudioQuality audioQuality, boolean isDownloadable) {  
        editAudio(audioQuality, isDownloadable,  
                 properties.get(0),      // title  
                 properties.get(1),      // description  
                 properties.get(2),      // link  
                 properties.get(3),      // accessRights  
                 properties.get(4),      // license  
                 properties.get(5),      // language  
                 intProperties.get(0),   // rating  
                 intProperties.get(1),   // viewCount  
                 intProperties.get(2)    // shareCount  
    }.
```

```
        );
    }

    // ...existing code...
}

luisFelipeM this test didn't pass: @Test @DisplayName("Get Description Test") @Order(4) void getDescription() { assertNotNull(this.tReference.getDescription()); this.tReference.setDescription("A long description"); assertEquals("A long description", this.tReference.getDescription()); }  
  
org.opentest4j.AssertionFailedError:  
  
Expected :null Actual : <Click to see difference>  
  
at org.junit.jupiter.api.AssertionFailureBuilder.build(AssertionFailureBuilder.java:151)
at org.junit.jupiter.api.AssertionFailureBuilder.buildAndThrow(AssertionFailureBuilder.java:132)
at org.junit.jupiter.api.Assertions.assertNull(AssertNull.java:50)
at org.junit.jupiter.api.Assertions.assertNull(AssertNull.java:35)
at org.junit.jupiter.api.Assertions.assertNull(AssertNull.java:30)
at org.junit.jupiter.api.Assertions.assertNull(Assertions.java:279)
at org.example.studymaterial.ReferenceTest.getDescription(ReferenceTest.java:43)
at java.base/java.lang.reflect.Method.invoke(Method.java:580)
at java.base/java.util.ArrayList.forEach(ArrayList.java:1596)
at java.base/java.util.ArrayList.forEach(ArrayList.java:1596)  
  
GitHub Copilot  
  


### Step-by-step plan



1. Test expects description to be null initially
2. Currently description is initialized as empty string ""
3. Need to modify TextReference constructor to set description to null
4. Update Reference class updateMetadata method to handle null values

```

```
public class TextReference extends Reference {  
    private int wordCount;  
    private String format;  
  
    public TextReference(String title, String language, int wordCount, String format, String accessRight)  
        updateMetadata(title, null, null); // Set description to null initially  
        this.wordCount = wordCount;  
        this.format = format;  
        updateAccessControl(accessRights, "", false);  
    }  
    // ...existing code...  
}
```

```
public abstract class Reference {  
    // ...existing code...  
  
    protected void updateMetadata(String title, String description, String link) {  
        this.title = title;  
        this.description = description; // Will be null if passed as null  
        this.link = link;  
    }  
    // ...existing code...  
}
```