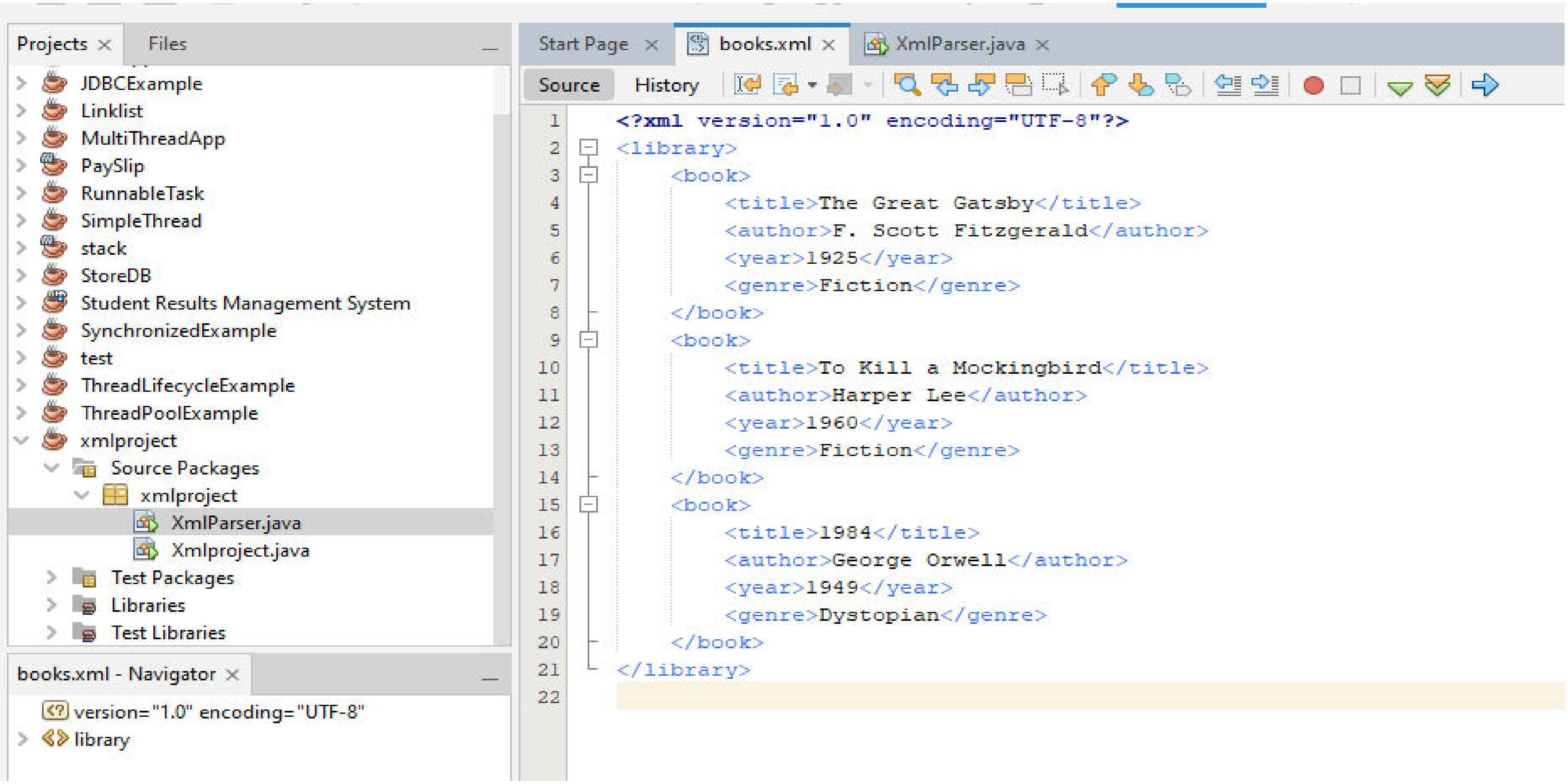
- **Creating First XML Document**

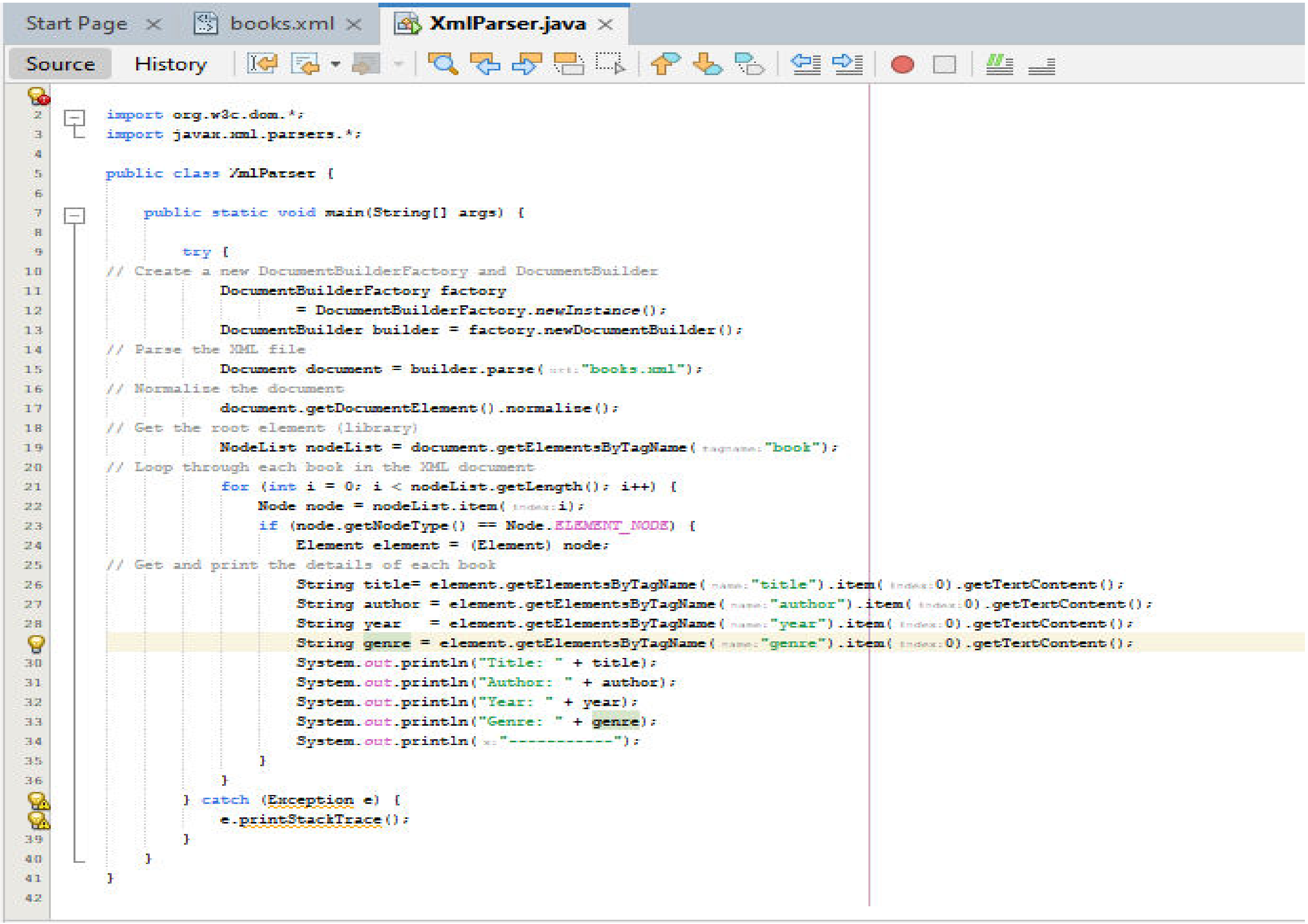
  - Create a new file named books.xml



```xml
<?xml version="1.0" encoding="UTF-8"?>
<library>
    <book>
        <title>The Great Gatsby</title>
        <author>F. Scott Fitzgerald</author>
        <year>1925</year>
        <genre>Fiction</genre>
    </book>
    <book>
        <title>To Kill a Mockingbird</title>
        <author>Harper Lee</author>
        <year>1960</year>
        <genre>Fiction</genre>
    </book>
    <book>
        <title>1984</title>
        <author>George Orwell</author>
        <year>1949</year>
        <genre>Dystopian</genre>
    </book>
</library>
```

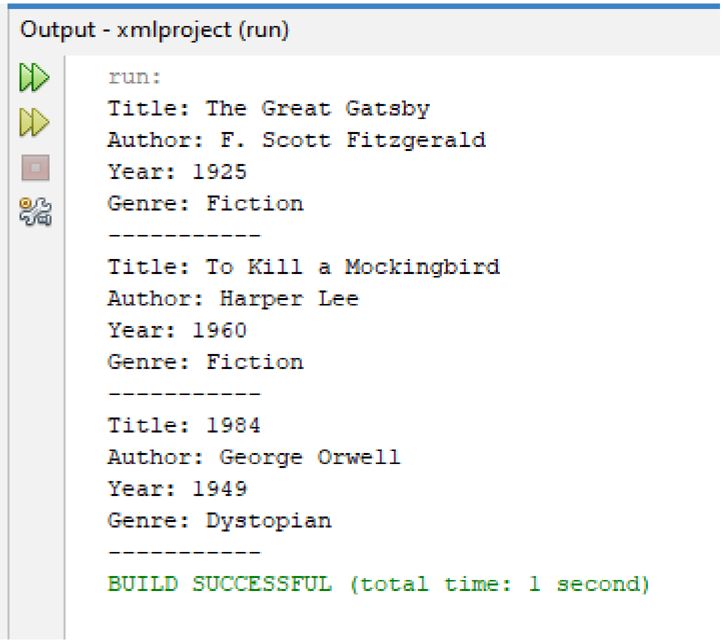
```xml
<?xml version="1.0" encoding="UTF-8"?>
<library>
  <book>
    <title>The Great Gatsby</title>
    <author>F. Scott Fitzgerald</author>
    <year>1925</year>
    <genre>Fiction</genre>
  </book>
  <book>
    <title>To Kill a Mockingbird</title>
    <author>Harper Lee</author>
    <year>1960</year>
    <genre>Fiction</genre>
  </book>
  <book>
    <title>1984</title>
    <author>George Orwell</author>
    <year>1949</year>
    <genre>Dystopian</genre>
  </book>
</library>
```

- **Parsing XML in Java**
  - **Create a Java Class for XML Parsing:**



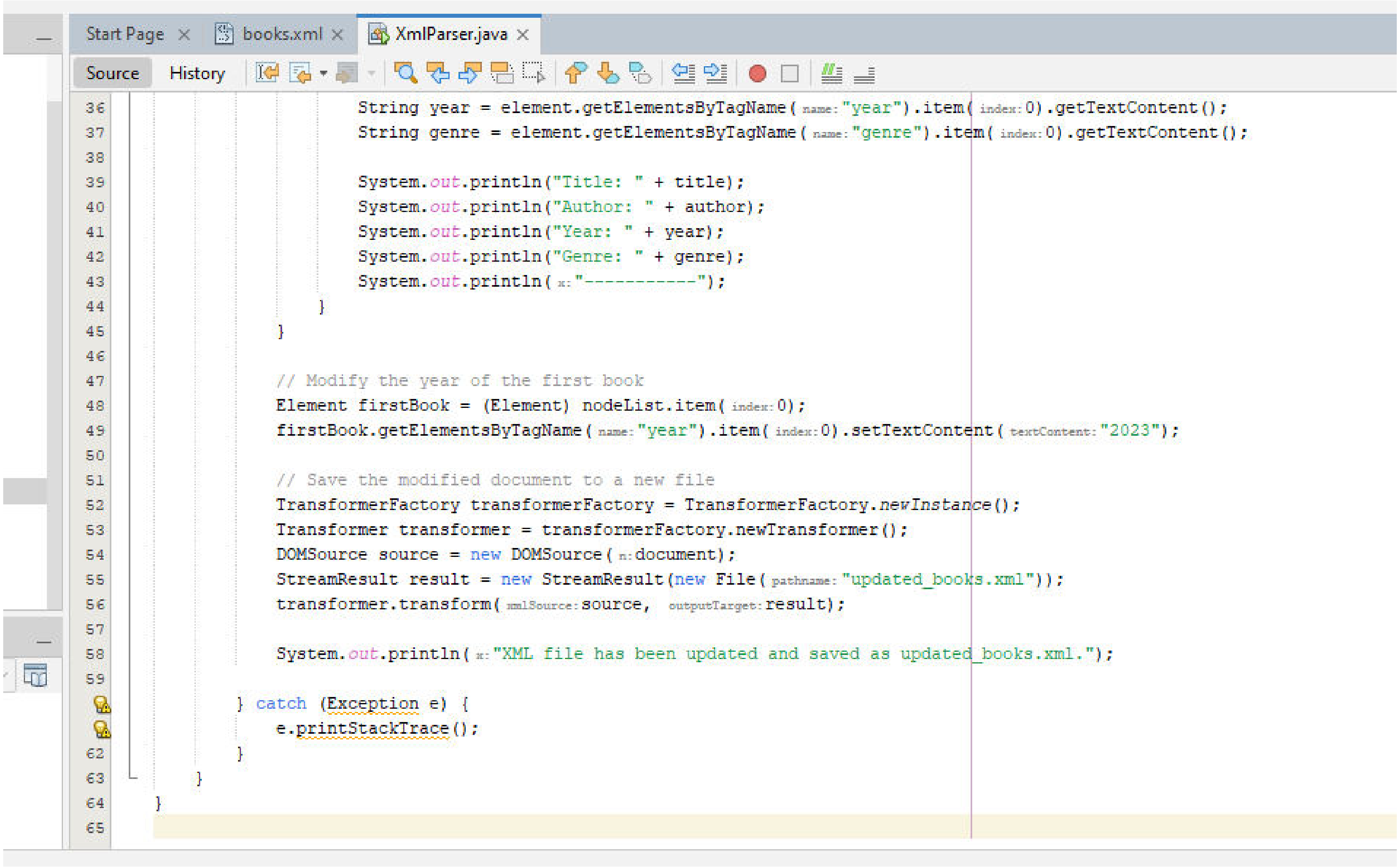
```
import org.w3c.dom.*;
import javax.xml.parsers.*;

public class XmlParser {

  public static void main(String[] args) {

    try {
// Create a new DocumentBuilderFactory and DocumentBuilder
      DocumentBuilderFactory factory
          = DocumentBuilderFactory.newInstance();
      DocumentBuilder builder = factory.newDocumentBuilder();
// Parse the XML file
      Document document = builder.parse( uri:"books.xml");
// Normalize the document
      document.getDocumentElement().normalize();
// Get the root element (library)
      NodeList nodeList = document.getElementsByTagName( tagname:"book");
// Loop through each book in the XML document
      for (int i = 0; i < nodeList.getLength(); i++) {
        Node node = nodeList.item( index:i);
        if (node.getNodeType() == Node.ELEMENT_NODE) {
          Element element = (Element) node;
// Get and print the details of each book
          String title= element.getElementsByTagName( name:"title").item( index:0).getTextContent();
          String author = element.getElementsByTagName( name:"author").item( index:0).getTextContent();
          String year   = element.getElementsByTagName( name:"year").item( index:0).getTextContent();
          String genre = element.getElementsByTagName( name:"genre").item( index:0).getTextContent();
          System.out.println("Title: " + title);
          System.out.println("Author: " + author);
          System.out.println("Year: " + year);
          System.out.println("Genre: " + genre);
          System.out.println( x:"------------");
        }
      }
    } catch (Exception e) {
      e.printStackTrace();
    }
  }
}
```

```java
import org.w3c.dom.*;
import javax.xml.parsers.*;

public class XmlParser {

    public static void main(String[] args) {
        try {
            // Create a new DocumentBuilderFactory and DocumentBuilder
            DocumentBuilderFactory factory = DocumentBuilderFactory.newInstance();
            DocumentBuilder builder = factory.newDocumentBuilder();

            // Parse the XML file
            Document document = builder.parse("books.xml");

            // Normalize the document
            document.getDocumentElement().normalize();

            // Get all book elements
            NodeList nodeList = document.getElementsByTagName("book");

            // Loop through each book in the XML document
            for (int i = 0; i < nodeList.getLength(); i++) {
                Node node = nodeList.item(i);

                if (node.getNodeType() == Node.ELEMENT_NODE) {
                    Element element = (Element) node;

                    // Get and print the details of each book
                    String title = element.getElementsByTagName("title").item(0).getTextContent();
                    String author = element.getElementsByTagName("author").item(0).getTextContent();
                    String year = element.getElementsByTagName("year").item(0).getTextContent();
                    String genre = element.getElementsByTagName("genre").item(0).getTextContent();

                    System.out.println("Title: " + title);
                    System.out.println("Author: " + author);
                    System.out.println("Year: " + year);
                    System.out.println("Genre: " + genre);
                    System.out.println("-----------");
                }
            }

        } catch (Exception e) {
            e.printStackTrace();
        }
    }
}
```



```
run:
Title: The Great Gatsby
Author: F. Scott Fitzgerald
Year: 1925
Genre: Fiction
-----------
Title: To Kill a Mockingbird
Author: Harper Lee
Year: 1960
Genre: Fiction
-----------
Title: 1984
Author: George Orwell
Year: 1949
Genre: Dystopian
-----------
BUILD SUCCESSFUL (total time: 1 second)
```

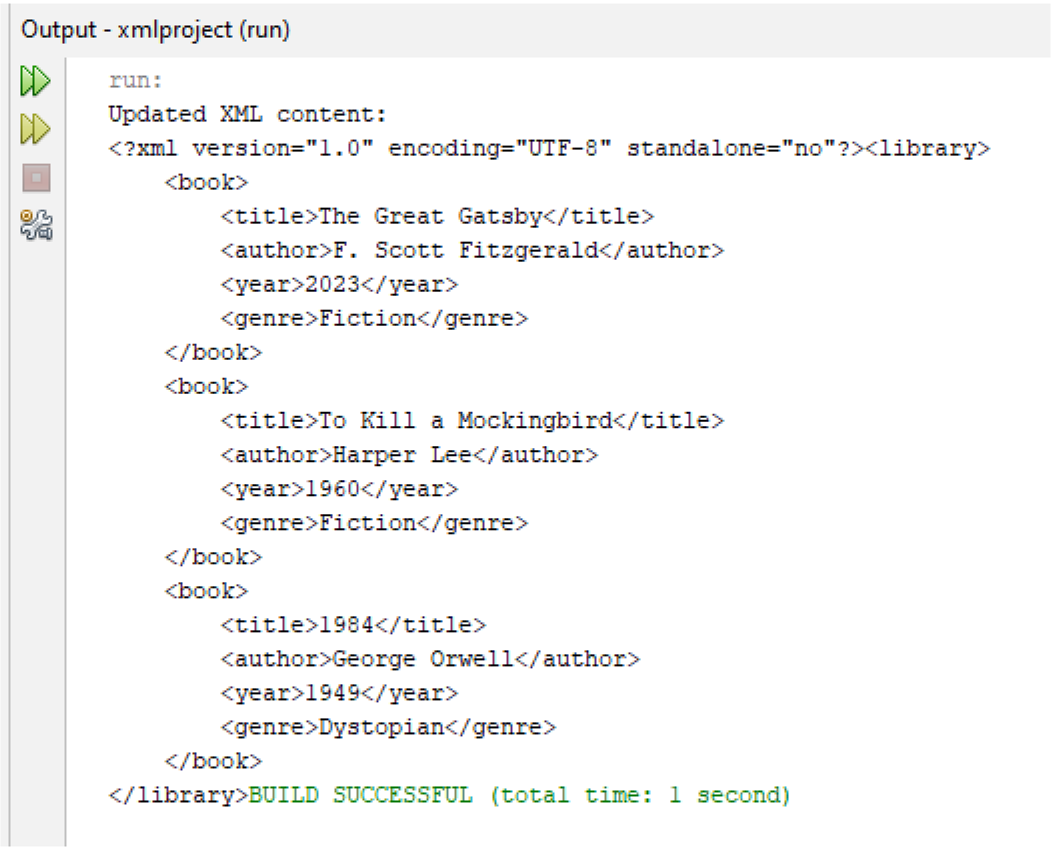
Modifying XML Data



```
                    String year = element.getElementsByTagName( name: "year").item( index: 0).getTextContent();
                    String genre = element.getElementsByTagName( name: "genre").item( index: 0).getTextContent();

                    System.out.println("Title: " + title);
                    System.out.println("Author: " + author);
                    System.out.println("Year: " + year);
                    System.out.println("Genre: " + genre);
                    System.out.println( x: "-----------");
                }
            }

            // Modify the year of the first book
            Element firstBook = (Element) nodeList.item( index: 0);
            firstBook.getElementsByTagName( name: "year").item( index: 0).setTextContent( textContent: "2023");

            // Save the modified document to a new file
            TransformerFactory transformerFactory = TransformerFactory.newInstance();
            Transformer transformer = transformerFactory.newTransformer();
            DOMSource source = new DOMSource( n: document);
            StreamResult result = new StreamResult(new File( pathname: "updated_books.xml"));
            transformer.transform( xmlSource: source,  outputTarget: result);

            System.out.println( x: "XML file has been updated and saved as updated_books.xml.");

        } catch (Exception e) {
            e.printStackTrace();
        }
    }
}
```

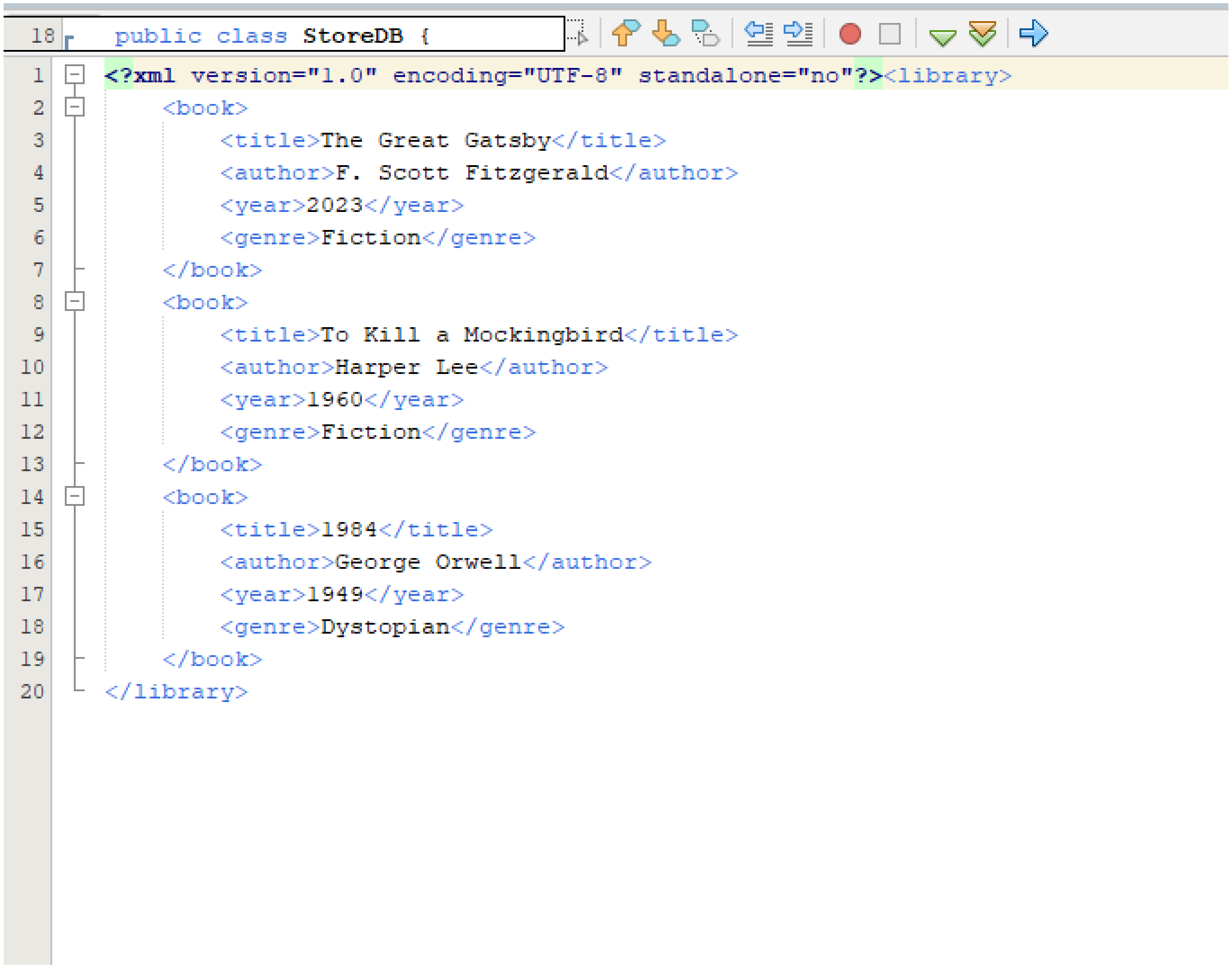
```
String year = element.getElementsByTagName("year").item(0).getTextContent();
String genre = element.getElementsByTagName("genre").item(0).getTextContent();

System.out.println("Title: " + title);
System.out.println("Author: " + author);
System.out.println("Year: " + year);
System.out.println("Genre: " + genre);
System.out.println("---");
}

// Modify the year of the first book
Element firstBook = (Element) nodeList.item(0);
firstBook.getElementsByTagName("year").item(0).setTextContent("2023");

// Save the modified document to a new file
TransformerFactory transformerFactory = TransformerFactory.newInstance();
Transformer transformer = transformerFactory.newTransformer();
DOMSource source = new DOMSource(document);
StreamResult result = new StreamResult(new File("updated_books.xml"));
transformer.transform(source, result);

System.out.println("XML file has been updated and saved as updated_books.xml.");
}
catch (Exception e) {
   e.printStackTrace();
}
```

Output



```
run:
Updated XML content:
<?xml version="1.0" encoding="UTF-8" standalone="no"?><library>
    <book>
        <title>The Great Gatsby</title>
        <author>F. Scott Fitzgerald</author>
        <year>2023</year>
        <genre>Fiction</genre>
    </book>
    <book>
        <title>To Kill a Mockingbird</title>
        <author>Harper Lee</author>
        <year>1960</year>
        <genre>Fiction</genre>
    </book>
    <book>
        <title>1984</title>
        <author>George Orwell</author>
        <year>1949</year>
        <genre>Dystopian</genre>
    </book>
</library>BUILD SUCCESSFUL (total time: 1 second)
```

updated_books.xml



```xml
<?xml version="1.0" encoding="UTF-8" standalone="no"?><library>
    <book>
        <title>The Great Gatsby</title>
        <author>F. Scott Fitzgerald</author>
        <year>2023</year>
        <genre>Fiction</genre>
    </book>
    <book>
        <title>To Kill a Mockingbird</title>
        <author>Harper Lee</author>
        <year>1960</year>
        <genre>Fiction</genre>
    </book>
    <book>
        <title>1984</title>
        <author>George Orwell</author>
        <year>1949</year>
        <genre>Dystopian</genre>
    </book>
</library>
```