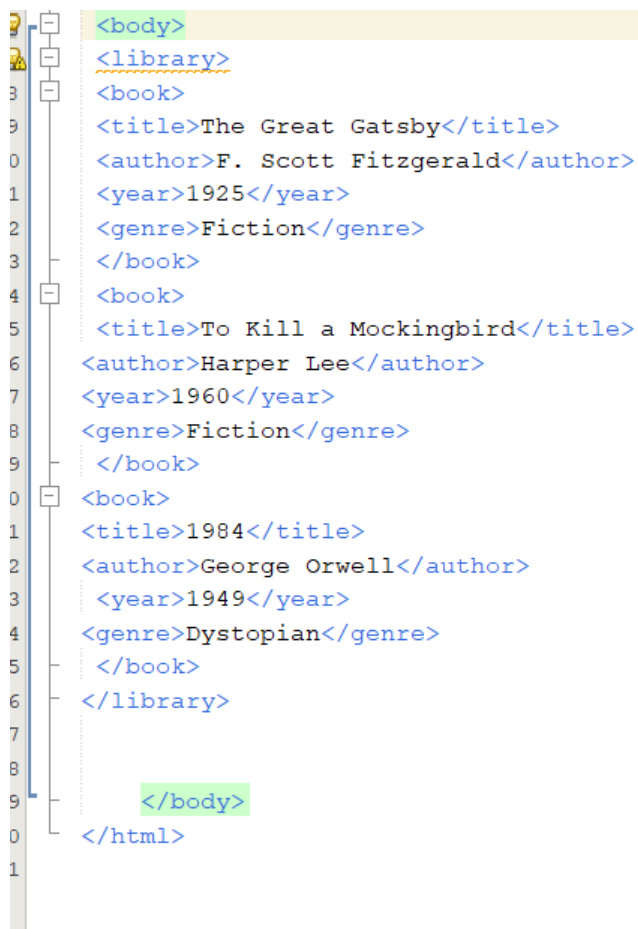


## Introduction to XML and Basic Operations

### 1. Create an XML Document:

- o Open your IDE (NetBeans, Eclipse, etc.) and create a new Java Project.
- o Create a new file named books.xml in your project folder.
- o Use the following example to create an XML document representing a simple list of books:



```
<body>
<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>
</body>
</html>
```

### 2. Create a Java Class for XML Parsing:

- o Create a new Java class named **XmlParser.java** in your project.
- o Add the following code to read and parse the books.xml file:

```
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 the root element (library)
            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: 0 seconds)

```

### 3. Modify the XML Document:

- In the `XmlParser.java` class, add code to update the **year** of the first book in the XML:

```

// Modify the year of the first book

Element firstBook = (Element) nodeList.item(0);

firstBook.getElementsByTagName("year").item(0).setTextContent("2023");

// Save the modified document

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);

```

```
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
-----
XML file updated and saved as updated_books.xml
BUILD SUCCESSFUL (total time: 0 seconds)
```

```
▼<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>
```