

03.XML (eXtensible Markup Language)

3.1 What is XML?

XML is a markup language for storing and transporting data.

3.2 Create an XML Document:

```
<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>
```

```

<!--
Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this license
Click nbfs://nbhost/SystemFileSystem/Templates/XML/XMLDocument.xml to edit this template
-->
<?xml version="1.0" encoding="UTF-8" ?>
<library>
  4.
  <book>
    5.
    <title>The Great Gatsby</title>
    6.
    <author>F. Scott Fitzgerald</author>
    7.
    <year>1925</year>
    8.
    <genre>Fiction</genre>
    9.
  </book>
  10.
  <book>
    11.
    <title>To Kill a Mockingbird</title>
    12.
    <author>Harper Lee</author>
    13.
    <year>1960</year>
    14.
    <genre>Fiction</genre>
    15.
  </book>
  16.
  <book>
    17.
    <title>1984</title>
    18.
    <author>George Orwell</author>
    19.
    <year>1949</year>
    20.
    <genre>Dystopian</genre>
    21.
  </book>
  22.
</library>

```

3.3 Parsing XML in Java

```

import javax.xml.parsers.DocumentBuilderFactory;
import javax.xml.parsers.DocumentBuilder;
import org.w3c.dom.Document;
import org.w3c.dom.NodeList;
import org.w3c.dom.Node;
import org.w3c.dom.Element;
import java.io.File;

public class xmlPaeser {
    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
File xmlFile = new File("ListOfBooks.xml");
Document document = builder.parse(xmlFile);

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

// Get the list of <book> elements
NodeList nodeList = document.getElementsByTagName("book");

// Loop through each <book> element
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 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)
|
```









3.4 Modifying XML Data

```
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 updated and saved as updated_books.xml");
```

```

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)
|

```

	build	5/18/2025 8:26 PM	File folder	
	nbproject	5/18/2025 7:55 PM	File folder	
	src	5/18/2025 7:55 PM	File folder	
	test	5/18/2025 8:14 PM	File folder	
	build.xml	5/18/2025 7:55 PM	Microsoft Edge H...	4 KB
	ListOfBooks.xml	5/18/2025 9:30 PM	Microsoft Edge H...	1 KB
	manifest.mf	5/18/2025 7:55 PM	MF File	1 KB
	updated_books.xml	5/18/2025 10:07 PM	Microsoft Edge H...	1 KB

```

▼<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>

```