Lab Sheet 3: **Introduction to XML and Basic Operations**

**Create an XML Document**

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

<?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**

1. Create a new Java class named XmlParser.java in your project.
2. Add the following code to read and parse the books.xml file

package xmlprojects;

import java.io.File;

import org.w3c.dom.\*;

import javax.xml.parsers.\*;

import javax.xml.transform.Transformer;

import javax.xml.transform.TransformerFactory;

import javax.xml.transform.dom.DOMSource;

import javax.xml.transform.stream.StreamResult;

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("src/xmlprojects/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();

}

}

**Modifying XML Data**

1. In the XmlParser.java class, add code to update the year of the first book in the

package xmlprojects;

import java.io.File;

import org.w3c.dom.\*;

import javax.xml.parsers.\*;

import javax.xml.transform.Transformer;

import javax.xml.transform.TransformerFactory;

import javax.xml.transform.dom.DOMSource;

import javax.xml.transform.stream.StreamResult;

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("src/xmlprojects/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("-----------");

}

}

// 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);

} catch (Exception e) {

e.printStackTrace();

}

}

}

