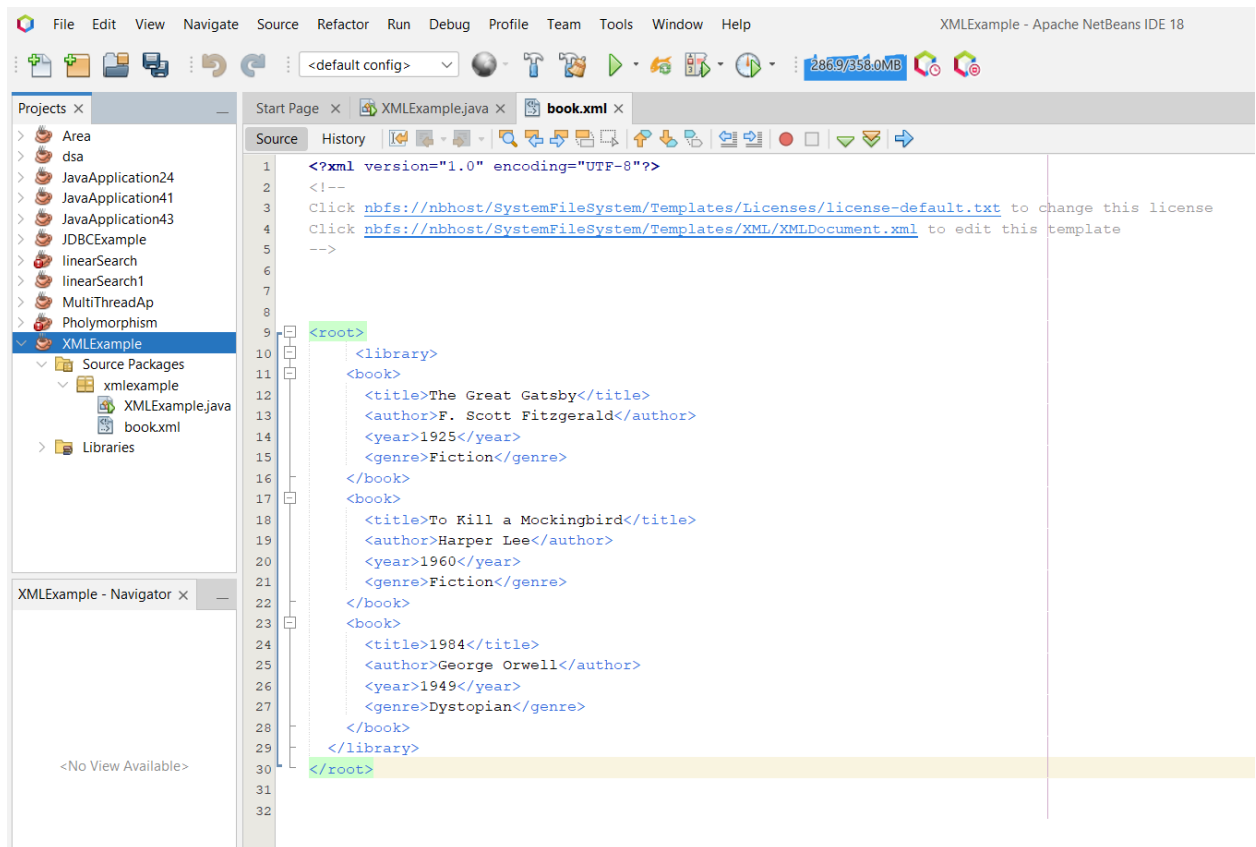


Lab Sheet: Introduction to XML and Basic Operations

Lab Tasks:

Part 2: Creating Your First XML Document

1. Create an XML Document:



Part 3: Parsing XML in Java

Create a Java Class for XML Parsing:

```
package xmlexample;

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;

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
            File xmlFile = new File("C:\\NAVEEN
GAYASHAN\\HNDIT\\XMLExample\\src\\xmlexample\\book.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) {

                // 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();
    }
}
}

```

output

Output - XMLExample (run)



```
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)
```

Part 4: Modifying XML Data

Modify the XML Document:

```
package xmlexample;

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;

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
            File xmlFile = new File("C:\\NAVEEN
GAYASHAN\\HNDIT\\XMLExample\\src\\xmlexample\\book.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("-----");
    }
}

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

//  Save the modified document to updated_books.xml
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");

```

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

```
// Save the modified document
```

```
}
```

output

Output - XMLExample (run)



```
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>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>
```