

Lab Sheet3: Introduction to XML and Basic Operations

Part 2: Creating Your First XML Document

1. Create an XML Document:

- create a new Java Project.
- Create a new file named books.xml in project folder.

Code:

```
<?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>
```

Output:

```
▼ <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>
```

Part 3: Parsing XML in Java

1. Create a Java Class for XML Parsing:
 - Create a new Java class named XmlParser.java
 - Add the code to the books.xml file:

Code:

```
package bookproject;

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("file:///C:/Users/Dula%20Welikala/OneDrive/Documents/NetBeansP
rojects/BookProject/src/bookproject/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

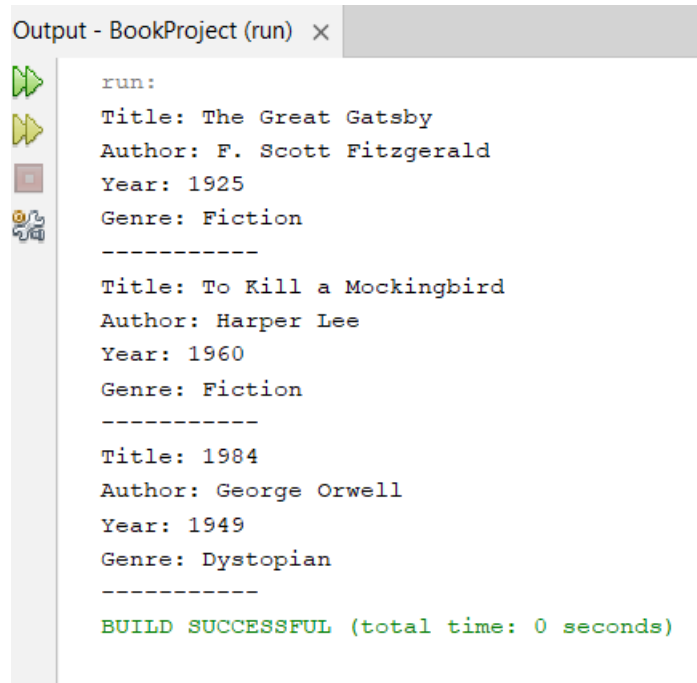
String title =element.getElementsByTagName("title").item(0).getTextContent();
```

```

        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();
}
}
}

```

Output:



```

Output - BookProject (run) x
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)

```

Part 4: Modifying XML Data

1. Modify the XML Document:

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

Code:

```
package bookproject;
```

```
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("file:///C:/Users/Dula%20Welikala/OneDrive/Documents/NetBeansProjects/BookProject/src/bookproject/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
```

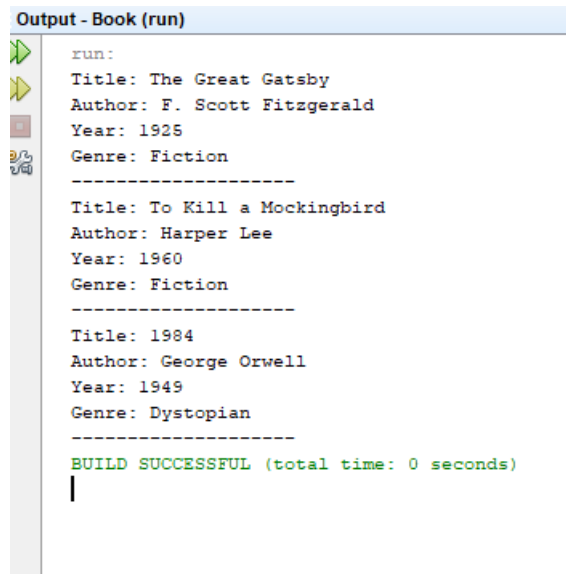
```

        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();
}
}

}

```

Output:



```

Output - Book (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
-----
BUILD SUCCESSFUL (total time: 0 seconds)
|

```