**XML CONSOLE APPLICATION**

**OVERVIEW**

The XML Console Application is designed to perform various operations on an XML document representing a library of books. The application allows users to initialize an XML document, display its contents, search, add, delete, update, filter elements, and serialize/deserialize data to/from XML files.

**FUNCTIONALITIES**

1. **Initialize XML Document**

* Creates an initial XML document (**library.xml**) with predefined book entries.
* Loads the XML document for further operations.

1. **Display Menu**

* Shows a menu with options for various operations.
* Users can select operations by entering the corresponding menu number.

1. **Search for Elements**

* Allows users to search for elements by tag name, attribute value, or sort elements by attribute value.
* Displays the results of the search.

1. **Add Element**

* Provides options to add new elements to the XML:
* Add element to a parent by ID.
* Add a parent element with multiple child elements.
* Add the same child element to different parents with different values.

1. **Delete Element**

* Provides options to delete elements from the XML:
* Delete parent element by ID.
* Delete a specific child element from a parent by ID.
* Delete a specific child element from all parent elements.

1. **Update Element**

* Provides options to update existing elements:
* Update element values by tag name for a specific parent ID.
* Update element tag names by tag name for a specific parent ID.
* Update parent element ID.
* Change similar tag names for every parent with similar child elements.

1. **Save Changes**

* Saves any modifications made to the XML document back to the file.

1. **Display XML**

* Displays the entire XML document in a readable format.

1. **Serialize to XML**

* Serializes book data into an XML file.
* Prompts the user to enter a path to save the serialized XML file.

1. **Deserialize from XML**

* Deserializes book data from an XML file.
* Displays the deserialized book information.

1. **Filter Books**

* Provides options to filter books based on author, year, or title.
* Displays the filtered results.

1. **Exit**

* Exits the application.

**USAGE**

**Initialize the Application**: Run the application to create the initial XML document.

**Display Menu**: The main menu provides options to perform various operations on the XML document.

**Search Elements**: Search for elements by tag name, attribute value, or sort them.

**Add Elements**: Add new elements to the XML document.

**Delete Elements**: Remove elements from the XML document.

**Update Elements**: Update existing elements in the XML document.

**Filter Books**: Filter books by author, year, or title.

**Save Changes**: Save modifications to the XML document.

**Serialize/Deserialize**: Serialize data to XML files and deserialize data from XML files.

**CONCLUSION**

The XML Console Application provides comprehensive functionality for managing an XML document representing a library of books. Users can perform CRUD operations, search, filter, and serialize/deserialize data, making it a versatile tool for XML manipulation.