Lab 4: To run examples based on XQuery, XPath , SAX and XML DOM

Theory:

Write short notes on:

- XQuery
- XPATH
- SAX and
- XML DOM

Programs

1. Consider the following XML document

```
<!-- books.xml -->
<library>
      <book>
            <title>Introduction to XML</title>
            <author>John Doe</author>
            <price>29.99</price>
      </book>
      <book>
            <title>Web Development Basics</title>
            <author>Jane Smith</author>
            <price>24.95</price>
      </book>
</library>
```

Using XQuery perform the following:

- retrieve the titles of books with a price less than 30:
- retrieves books with a price less than 30, orders them by title, and constructs a new XML document containing the titles, authors, and prices of those books.
- calculates the average price of all books in the library.

2. Using XPath, perform the following(Use lxml library of python to perform)

- Select All Book Titles:
- Select Authors of Books with Price Less Than 30:
- Select the First Book Title:
- Select All Books with Price Greater Than 25:

3. Write a simple Java example using the SAX API to parse an XML document:

4.Consider the following XML document

```
<!-- data.xml -->
<students>
  <student id="1">
    <name>John Doe</name>
    <age>20</age>
    <grade>85</grade>
  </student>
  <student id="2">
    <name>Jane Smith</name>
    <age>22</age>
    <grade>92</grade>
  </student>
</students>
```

Using this XML DOM,

- Add a new element to represent another student with an id of "3". The new student's details are as follows:

```
<student id="3">
  <name>Alice Johnson</name>
  <age>21</age>
  <grade>88</grade>
</student>
```

- Modify the grade of the student with id "2" from "92" to "95".
- Remove the student with id "1" from the XML document.