ISLAMIC UNIVERSITY OF TECHNOLOGY

SWE 4302

LAB 4 GROUP B

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Contents

Today's will related to the theory content. You will try to implement and apply the open/close principle and factory method. This lab's objectives,

1. Applying Open/close principle

2. Creating factory method/class

3. Using ploymorphism to replace the conditionals

1 TASKS

Modified Book list Tracker Requirements

Remember the scenario from Lab 1 where you had a meeting with a person called Alice Johnson who gave you the requirements to make a *Book list Tracker*. Recently, you had another meeting with Alice. Previously, she wanted the analyzer to read from a comma-separated values (CSV) formatted file. But now, she has changed the requirements and requested that the application should also be able to read from JSON and XML files.

Here is a sample of JSON formatted book list:

```
[
    {
        "title": "Atomic Habits",
        "author": "James Clear",
        "genre": "Self-Help",
        "pages": 320,
        "date_read": "2023-02-14"
    },
    {
        "title": "The Hobbit",
        "author": "J.R.R. Tolkien",
        "genre": "Fantasy",
        "pages": 310,
        "date_read": "2023-03-01"
    }
]
```

Here is a sample of XML formatted book list:

```
<books>
    <book>
        <title>Atomic Habits</title>
        <author>James Clear</author>
        <genre>Self-Help</genre>
        <pages>320</pages>
        <date_read>2023-02-14</date_read>
    </book>
    <book>
        <title>The Hobbit</title>
        <author>J.R.R. Tolkien</author>
        <genre>Fantasy</genre>
        <pages>310</pages>
        <date_read>2023-03-01</date_read>
    </book>
</books>
```

She wants you to modify the application according to her latest requirements. Also, the program should answer her previous queries the same as before:

- What is the total number of books she has read in the last year?

- How many books did she read each month?

- What are her top 10 longest books by page count?

- Which genre does she read the most?

- What is the average length (in pages) of the books she reads?

For Bonus marks, You are asked to write at least 10 test cases that will pass and verify your application.

You may use your previous code and refactor it or write the code all over again.