**Project Objectives:**

* Gain proficiency in constructing and using regular expressions (regex) to search, match, and replace text patterns.
* Understand the fundamentals of Java collections (e.g., ArrayList, Set, Map) and their usages.
* Develop skills in creating user interfaces using JavaFX for interaction with the text processing tool.
* Develop proficiency in implementing complex software projects by applying advanced programming concepts.

**Description:**

A text processing and data management tool that allows users to perform various operations on text data using regular expressions and manipulate collections of data using Java collections.

**Features:**

1. **Regular Expressions (Regex) Module:**
   * Implement functionality to search, match, and replace text using regular expressions.
   * Support for sets, ranges, alternations, short hands, and quantifiers in regex patterns.
   * Provide a user-friendly interface for inputting regex patterns and text data.
2. **Text Processing Module:**
   * Implement methods to search for patterns and replace characters in text data using regex.
   * Utilize Java's Pattern and Matcher classes for regex operations.
   * Display match results and replaced text to the user.
3. **Data Management Module:**
   * Utilize Java collections (e.g., ArrayList, Set, Map) for managing collections of data.
   * Allow users to create, update, and delete entries in collections.
   * Implement hashcode and equals methods for custom data objects to ensure proper collection operations.
4. **User Interface:**
   * Develop a user interface using JavaFX for interacting with the tool.
   * Provide options for inputting text data, regex patterns, and performing operations.
   * Display results of regex operations and collection manipulations to the user.

**Grading Criteria:**

| **Criteria** | Points |  |
| --- | --- | --- |
| **Working Functionalities - 50pts** |  |  |
| - Regex Module | 15 | Implementation of regex pattern matching and replacement; support for sets, ranges, alternations, shorthands, and quantifiers |
| - Text Processing Module | 15 | Integration of regex operations for searching and replacing text data; display of match results and replaced text |
| - Data Management Module | 10 | Implementation of collection management functionalities; handling of hashcode and equals methods |
| - User Interface (UI) | 10 | Development of a user-friendly interface using JavaFX; clear options for inputting data and performing operations |
| **Implementation and Design - 25** |  |  |
| - Code Quality | 10 | Well-structured and readable code following Java coding conventions; proper documentation and comments |
| - Efficiency and Performance | 10 | Efficient handling of text processing and collection operations; optimization of algorithms |
| - Design Patterns and Best Practices | 5 | Proper utilization of design patterns and best practices in Java programming; understanding of generic programming |
| **Error Handling - 15pts** |  |  |
| - Error Handling | 15 | The usage to Try .... Catch and display of proper error message in UI for the user, preventing the program from crashing. |
| **Creativity and Innovation - 10pts** |  |  |
| - Innovative Features | 10 | Subjective (When the trainee is able to add any advanced feature, improving the user experience) |
| **Total** | **100** |  |

**NB:**

* For consistency sake, please use the JDK 21 (LTS)
* Kindly push your project to GitHub and submit your GitHub repository link. (Remember to make your repository public)
* Add your project requirements documentation to your repository
* Submit a link of a maximum of 10 minutes [loom video recording](https://www.loom.com/) of you explaining and running your application
* Kindly add the executable file (.jar) to your GitHub repository