

**CMPS211 Advanced Programming Techniques**  
*Online Collaborative Text Editor*

## Overview

In this project you are required to design and implement an online real-time collaborative text editor. A collaborative text editor is a software that allows multiple users on different machines to edit the same document. One example of an online collaborative text editor is Google Docs. The aim of this project is to:

- Develop a basic online collaborative text editor
- Practice applying concepts you learned in the course
- Practice your Java programming skills

## Specification

### User Management [10%]

- User Registration: Allow users to register and create an account.
- User Authentication: Allow users to login to their account.

### Document Management [25%]

- File Management: Allow users to create, open, rename, and delete files.
- Access Control: Allow users to share documents with other users and control sharing permissions (viewer or editor). This submodule also ensures that only authorized users can view/edit/rename documents and only the owner can delete the file.
- List Documents: Allow the user to see a list of their documents and documents shared with them.

### Real-time Collaborative Editing [40%]

- Support File Editing: Allow users to edit the document text and format (support bold and italic only)
- Support Concurrent edits: Allow multiple users to edit the text file at the same time. Implement a reasonable algorithm to handle concurrency issues and conflicts occurring due to multiple edits happening at the same time by different users.
- Real-time Updates: Allow user to view in real-time the edits done by other users and a representation of other users' cursors moving

### UI [25%]

Implement a simple UI for the following parts:

- Login
- Sign up
- File Management:
  - a. List all documents owned by user
  - b. List all documents shared by others
  - c. Create a document
  - d. Delete, rename, share, and open options for each document (as per permissions)
- Text editor

### Bonus

- Supporting version history and allow rolling back to previous document version

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# Implementation and Deliverables

## Deadlines

All teams will deliver the project to the course classroom on Sunday (11th of May) at 4 pm. Each team will discuss the project on the scheduled day and time.

Provide a zipped folder named **Team\_<team number>.zip** containing the following materials:

- A link to your github source project
- A readme.txt, explaining how to run your code
- A members.txt containing the names and IDs of each student in the group
- A PDF file containing any algorithms you've used

## Teams

Work in groups of 3-4 members.

## Implementation

- Implementation is done mainly in **Java**. However, for the UI module use the languages/frameworks you want.
- It is your responsibility to select the best data structures, algorithms, techniques and tools that enhance the project performance
- You should handle basic network problems and exceptions in your program (connection drops, wrongly formatted messages..etc.)

## Libraries and Packages Regulations

You could use a library only if you followed **all** of the points below:

- You can use any library you want for implementing the UI and user management
- For the **document management** and **real-time editing** modules, you **can't** use a library that does the whole module functionality or a high percentage of it (i.e., you can't use a library to do the whole collaborative editing module), so using libraries must be for a small percentage of the module functionality. If you are not sure if library usage is allowed or not, contact instructors for approval.
- You are responsible for the library accuracy. (If it does a bad job, then it is your responsibility).
- You should understand how the library works.
- You can use any database management system.

## Evaluation and Grading Criteria

- The project is graded as a whole and the discussion decides what is the grade of each student (there's no piggybacking)
- Any delay in delivery will be penalized by losing 10% of the grade for each late day
- Code must be original, and must not be copied or shared from any other source, except as provided by the class instructors.
- **Note: A plagiarized project means ZERO in the project and deduct some grades from the other coursework. Please, do not put yourself in such a situation.**

~~~~~ Good Luck ~~~~~