**University of Central Punjab, Lahore**

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**Faculty of Information Technology**

Project proposal

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**Subject:** DSA

**Console-based Text Editor**

**Objective:**

The objective of this project is to develop a console-based text editor that uses stack, hash tables and linked list data structures for efficient text manipulation operations.

**Features:**

* **Insertion:** Allow users to insert words or sentences.
* **Deletion:** Enable users to delete words or sentences.
* **Replacement:** Provide the option to replace a specific word or sentence at the desired position (Replace only specific content).
* **Undo and Redo:** Implement undo and redo functionality to revert or restore previous text modifications.
* **Save in File:** Allow users to save the edited text into a file for future retrieval.
* **Load from File:** Enable users to load a text file into the editor for further editing.
* **Search and Replace:** Provide the ability to search for specific words or sentences and replace them with new content (Replace all matching content).
* **Word Count:** Display the total word count in the text (only words).
* **Line Count:** Display the total line count in the text.
* **Antonym Synonym Lookup:** Provide ability to find Antonyms and Synonyms of words

**Implementation:**

There will be two scenarios for input methods. One is for word-by-word input and the 2nd one will be for complete sentence input. User will be asked to select any of the input method and then he will perform operation according to his choice. The text editor will be implemented using stack and linked list data structures. The stack will be used to track text modifications for undo and redo operations, while the linked list will be used to store the text content with each word or sentence represented as a separate node. The Hash Table Data Structures will be used to find the Synonyms and Antonyms.

**Reasons to choose different Data Structure:**

I used Hash Table for Antonym Synonym Lookupbecause my main focus was to search the word in fastest way and Hash Table provides the ability to find the word in near to constant time(Chaining Type).

I used Stack for Undo and Redo function because I want to perform these functions in constant time.

For insertion and other functions I used doubly linked list.