Business Requirements

Project Overview

**Project Name:**

* PassBreach

**Description:**

* PassBreach is an educational tool designed to demonstrate the process of brute force password cracking. It helps users understand the importance of password security by showing how easily passwords can be cracked using brute force techniques.

Goals and Objectives

**Education:**

* Provide an interactive tool to teach users about the vulnerabilities of weak passwords.

**Efficiency:**

* Implement optimized algorithms and data structures to enhance the performance of the password cracking process.

**User Experience:**

* Offer a clear and engaging user interface to facilitate learning and experimentation.

**Test Driven Development:**

* Ensure the implementation is robust and reliable through comprehensive testing and use of interfaces.

Requirements

Functional Requirements

User Input:

* Users can input a password or hash to be cracked.
* Users can specify the character set to use for brute force attacks.
* Users can set the number of threads to optimize the cracking process.

Password Cracking:

* Implement a brute force algorithm using efficient data structures and algorithms.
* Support parallel processing to enhance performance.
* Provide real-time feedback on the progress of the cracking process.

Output:

* Display the cracked password if found.
* Show the time taken to crack the password.
* Display a message if the password is not found within a reasonable time.

Non-Functional Requirements

Performance:

* The system should handle large input spaces efficiently.
* The application should utilize system resources effectively to minimize execution time.

Scalability:

* The system should be scalable to support multiple threads and large datasets.

Usability:

* The user interface should be intuitive and easy to navigate.
* Provide clear instructions and documentation for users.
* The system should work on MacOS, Windows and Linux environments

Maintainability:

* The codebase should be modular and use interfaces to facilitate testing and future enhancements.
* Adhere to best practices in software development for readability and maintainability.