Password Generator Program Documentation

# Introduction

This document provides a detailed explanation of the Password Generator program written in Python. The program allows users to generate random passwords of specified lengths, incorporating both numbers and uppercase letters to increase password complexity.

# Code Overview

## 1. Importing Libraries

The program uses the `random` module from Python’s standard library to generate random characters for password creation. This module is essential for adding randomness to both the selection of characters and the replacements with numbers and uppercase letters.

## 2. Generating Passwords

The main function responsible for generating the passwords is `generate\_passwords(pw\_lengths)`. It accepts a list of integers representing the length of each password. The function generates passwords composed of lowercase letters, and then replaces random characters with numbers and uppercase letters. The `alphabet` variable defines the set of characters that the password can contain.

## 3. Replacing Characters with Numbers

The function `replace\_with\_number(password)` replaces one or two characters in the password with random digits. This enhances the password's complexity by introducing numeric characters.

## 4. Replacing Characters with Uppercase Letters

The function `replace\_with\_uppercase\_letter(password)` similarly replaces one or two characters with their uppercase versions, adding further complexity by mixing upper and lowercase letters in the generated password.

## 5. Main Function

The `main()` function is responsible for interacting with the user. It asks how many passwords should be generated and their lengths. The user is required to input the length of each password, with a minimum length of 3 characters enforced. The passwords are then generated, modified, and displayed back to the user.

# Conclusion

The Password Generator program provides a simple yet effective way to create randomized passwords with added complexity. By incorporating numbers and uppercase letters into lowercase-generated passwords, the security of each generated password is improved. This program can be used as a foundation for more advanced password generation systems.