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**Python Capstone Project: OTP Verification System**

**Test Cases for OTP Verification System**

**Introduction**

The OTP Verification System has been designed to ensure secure authentication by verifying a One-Time Password (OTP).

This document outlines the test cases that will verify if the system functions as expected under various conditions.

**Test Case 1: Correct OTP - First Attempt**

Verify the system grants access when the correct OTP is entered on the first attempt.

* Condition: The system has generated a valid OTP and simulated sending it to the provided email address.
* Steps:
  1. User enters the correct OTP received in the email.
  2. The system compares the entered OTP with the generated OTP.
* Expected Result:
  1. Access is granted.
  2. OTP verification message displays "Access granted! OTP verified successfully."

**Test Case 2: Incorrect OTP - First Attempt**

Verify the system denies access when an incorrect OTP is entered on the first attempt.

* Condition: The system has generated a valid OTP and simulated sending it to the provided email address.
* Steps:
  1. User enters an incorrect OTP (e.g., "123456").
  2. The system compares the entered OTP with the generated OTP.
* Expected Result:
  1. Access is denied.
  2. OTP verification message displays "Incorrect OTP. Please try again."

**Test Case 3: Correct OTP - Second Attempt**

Verify the system grants access when the correct OTP is entered on the second attempt after an initial incorrect entry.

* Condition: The system has generated a valid OTP and simulated sending it to the provided email address.
* Steps:
  1. User enters an incorrect OTP on the first attempt.
  2. User enters the correct OTP on the second attempt.
* Expected Result:
  1. Access is granted on the second attempt.
  2. OTP verification message displays "Access granted! OTP verified successfully."

**Test Case 4: Incorrect OTP - Third Attempt**

Verify the system denies access after three incorrect OTP attempts.

* Condition: The system has generated a valid OTP and simulated sending it to the provided email address.
* Steps:
  1. User enters incorrect OTPs on the first, second, and third attempts.
  2. The system compares the entered OTP with the generated OTP.
* Expected Result:
  1. Access is denied after 3 failed attempts.
  2. OTP verification message displays "Incorrect OTP. You have exceeded the maximum number of attempts. Access denied."

**Test Case 5: Empty OTP Input**

Verify the system prompts for OTP entry if the input is empty.

* Condition: The system has generated a valid OTP and simulated sending it to the provided email address.
* Steps:
  1. User presses enter without typing anything in the OTP input field.
  2. The system prompts for the OTP input again.
* Expected Result:
  1. The system should display a message like "Please enter the OTP you received."
  2. No access is granted until the OTP is entered.

**Test Case 6: Edge Case - OTP with Leading Zeros**

Verify the system handles OTPs with leading zeros correctly.

* Condition: The system has generated a valid OTP (e.g., "012345") and simulated sending it to the provided email address.
* Steps:
  1. User enters an OTP with leading zeros (e.g., "012345").
  2. The system compares the entered OTP with the generated OTP.
* Expected Result:
  1. Access is granted if the OTP matches exactly.
  2. OTP verification message displays "Access granted! OTP verified successfully."

### ****Conclusion:****

These test cases cover a wide range of scenarios to ensure that the OTP verification system behaves as expected under both normal and edge conditions. By thoroughly testing the system, we ensure a reliable, secure, and user-friendly experience for all users.