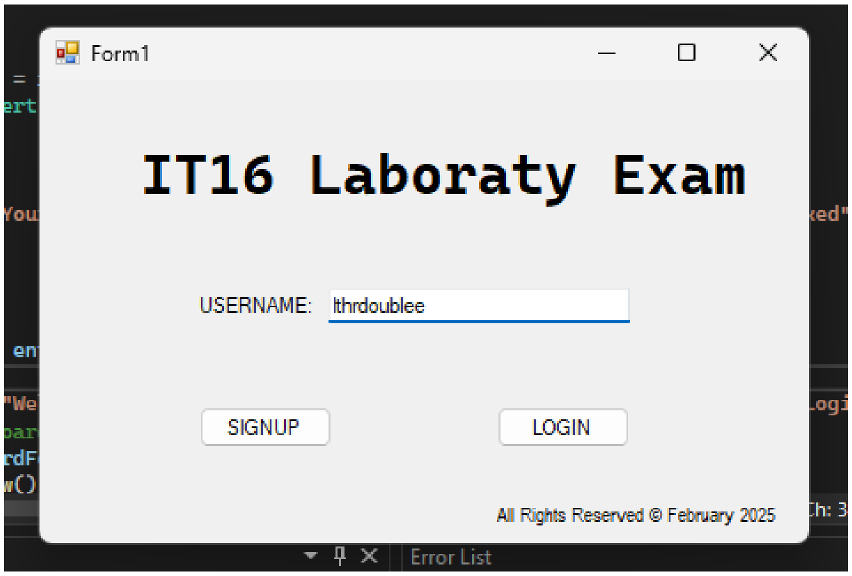
Tripole, Leoj B.
IT16 (6717)

Task 1: Mechanisms for Detection and Prevention

Description:
Enter username to login. When a user is found, it will ask the user to enter the password in the next form.



USERNAME: lthrdoublee

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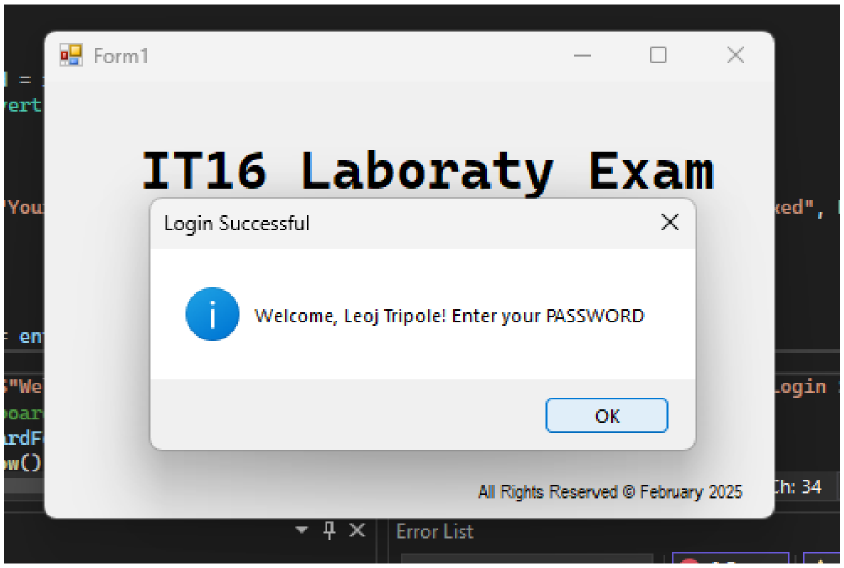

Login Successful

Welcome, Leoj Tripole! Enter your PASSWORD

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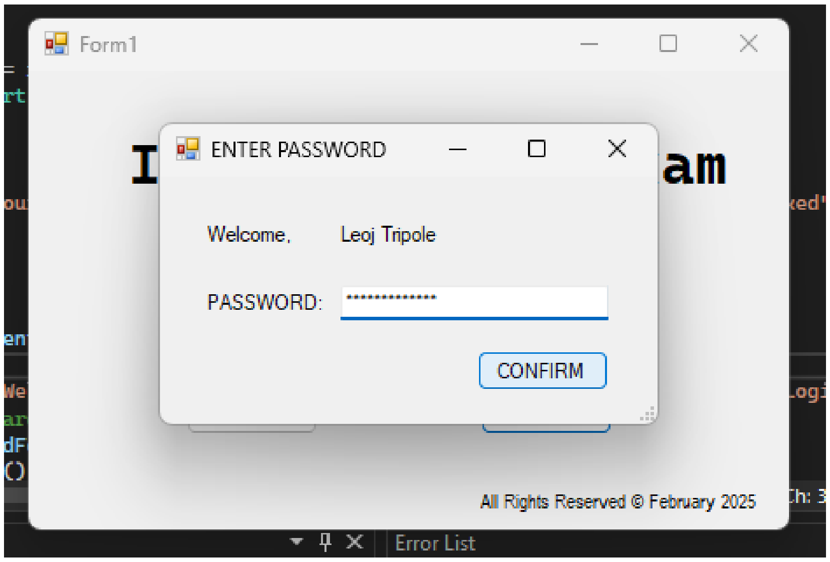
Description: When the user enters the correct password, it will welcome the user.



Welcome, Leoj Tripole

PASSWORD: **************

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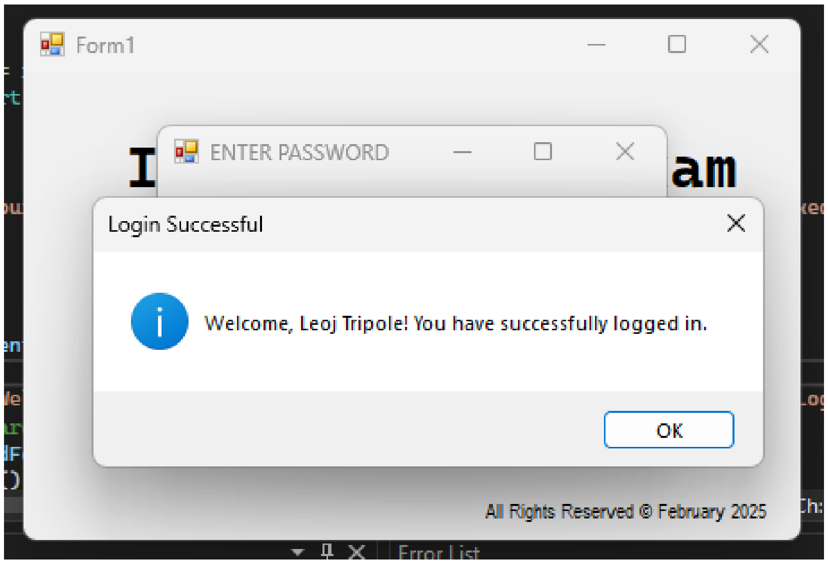

Login Successful

Welcome, Leoj Tripole! You have successfully logged in.

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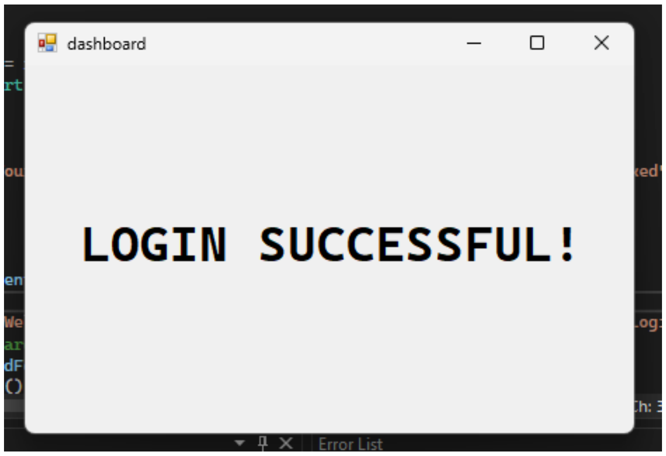
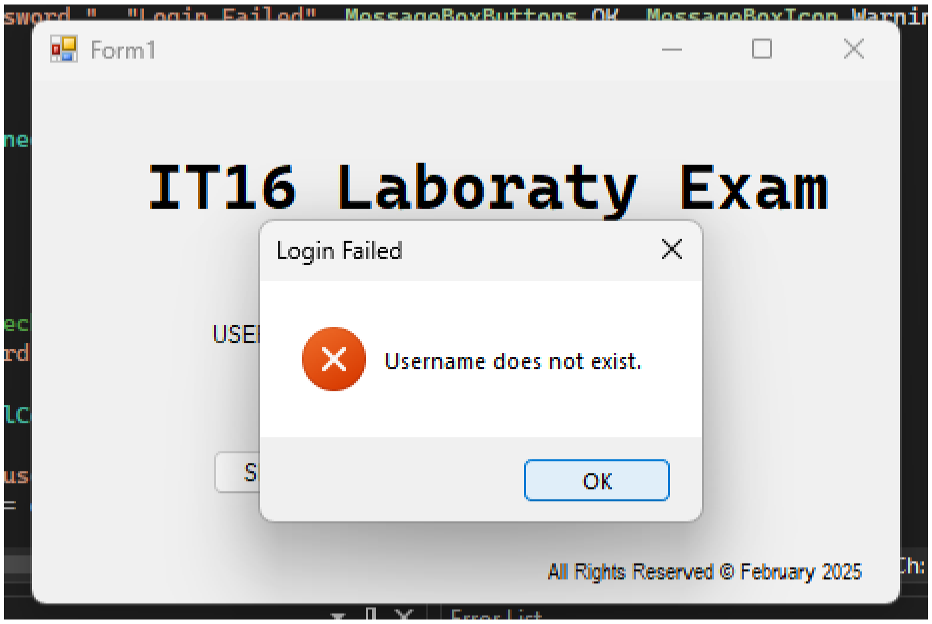


LOGIN SUCCESSFUL!

Scenario: When entering username and the user does not exist and is not found.



Login Failed

Username does not exist.

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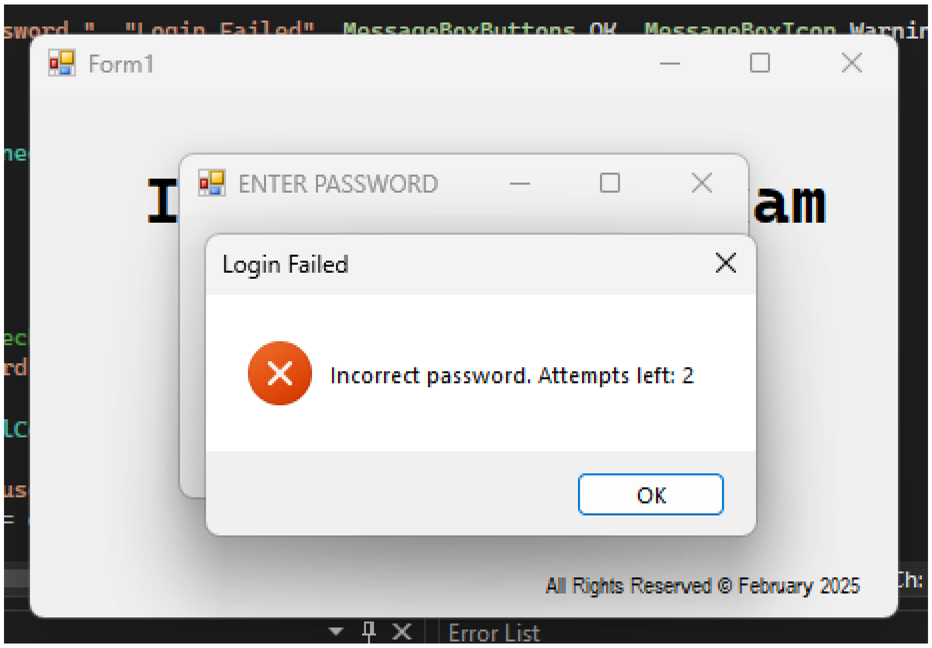
Scenario: Entering incorrect password, warning user to enter the correct password and showing the remaining attempts left.



Login Failed

Incorrect password. Attempts left: 2

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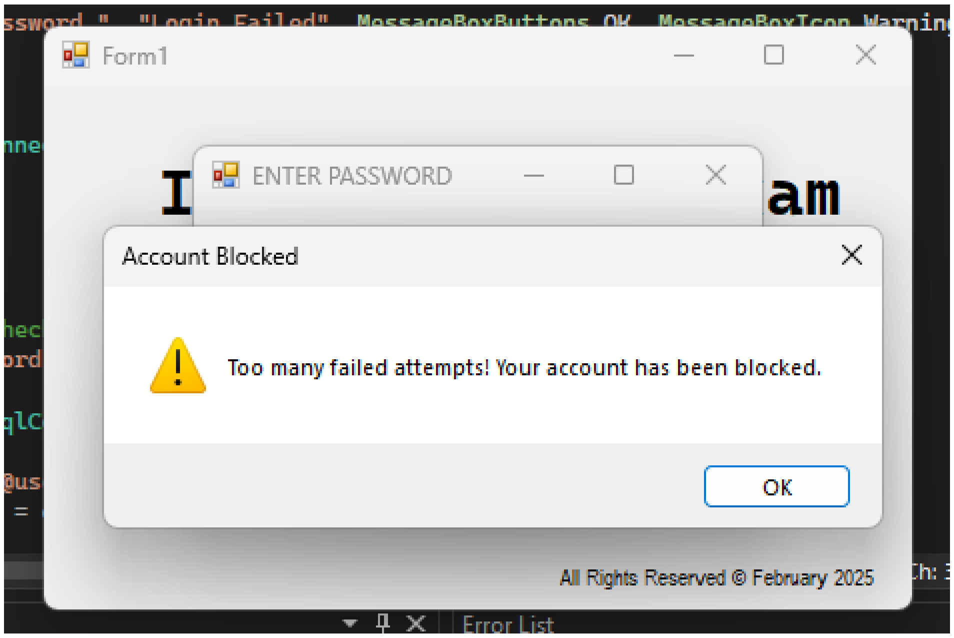
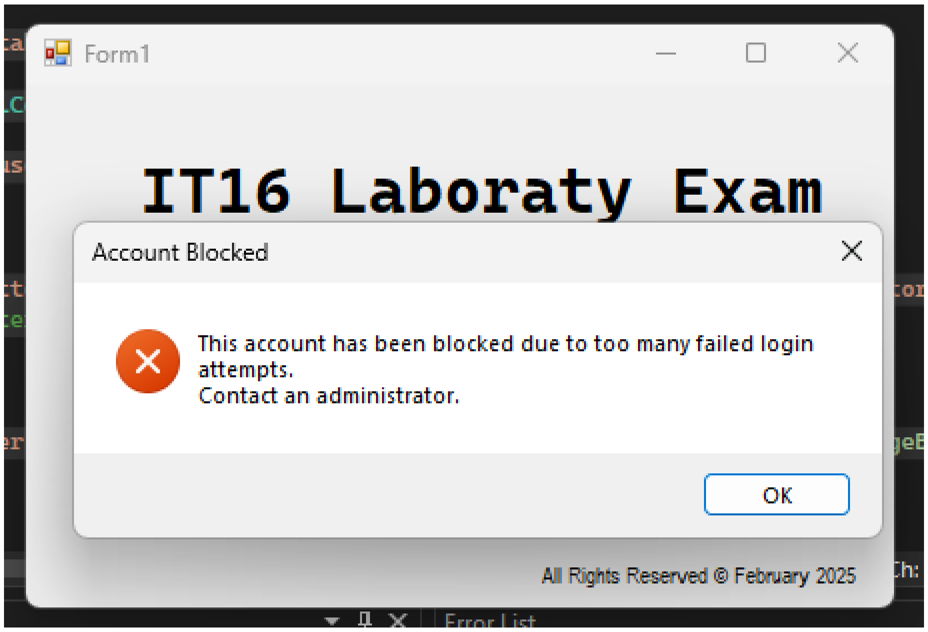
Scenario: The user failed to enter the correct credentials for the account. No more attempts left for the user and the user is blocked.



Too many failed attempts! Your account has been blocked.

When a blocked user attempts to login:



This account has been blocked due to too many failed login attempts.
Contact an administrator.

Portion of the source code for LOGIN form, asking for the username: *(C# .net)*

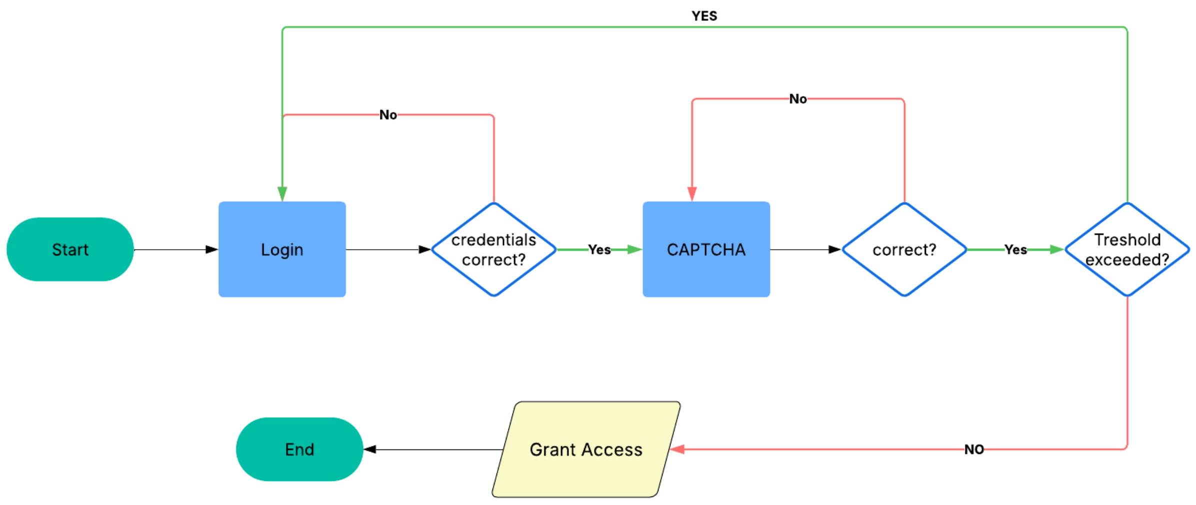
```
private void btn_login_Click(object sender, EventArgs e)
{
    string username = txtbox_username.Text.Trim();
    string userFullname = ""; // Variable to store full name

    if (string.IsNullOrEmpty(username))
    {
        MessageBox.Show("Please enter a username.", "Login Failed",
MessageBoxButtons.OK, MessageBoxIcon.Warning);
        return;
    }

    using (MySqlConnection conn = new MySqlConnection(connectionString))
    {
        try
        {
            conn.Open();
            string query = "SELECT user_fullname, user_status FROM user_table WHERE
user_username = @username";

            using (MySqlCommand cmd = new MySqlCommand(query, conn))
            {
                cmd.Parameters.AddWithValue("@username", username);

                using (MySqlDataReader reader = cmd.ExecuteReader())
                {
                    if (reader.Read())
                    {
                        userFullname = reader["user_fullname"].ToString();
                        int userStatus = Convert.ToInt32(reader["user_status"]);

                        if (userStatus == 0)
                        {
                            MessageBox.Show("This account has been blocked due to too
many failed login attempts.\nContact an administrator.",
                                            "Account Blocked",
                                            MessageBoxButtons.OK,
                                            MessageBoxIcon.Error);
                            return; // Stop further processing
                        }

                        // Proceed to password entry if user is active
                        MessageBox.Show($"Welcome, {userFullname}! Enter your
PASSWORD", "Login Successful", MessageBoxButtons.OK, MessageBoxIcon.Information);
                        enterPassword passwordForm = new enterPassword(username,
userFullname);
                        passwordForm.ShowDialog();
                    }
                    else
                    {
                        MessageBox.Show("Username does not exist.", "Login Failed",
MessageBoxButtons.OK, MessageBoxIcon.Error);
                    }
                }
            }
        }
        catch (Exception ex)
        {
            MessageBox.Show("Error: " + ex.Message, "Database Error",
MessageBoxButtons.OK, MessageBoxIcon.Error);
        }
    }
}
```

Portion of the source code for PASSWORD form (with integrated IDS):

```
private void button1_Click(object sender, EventArgs e)
{
    string enteredPassword = txtbox_password.Text.Trim();

    if (string.IsNullOrEmpty(enteredPassword))
    {
        MessageBox.Show("Please enter your password.", "Login Failed",
MessageBoxButtons.OK, MessageBoxIcon.Warning);
        return;
    }

    using (MySqlConnection conn = new MySqlConnection(connectionString))
    {
        try
        {
            conn.Open();

            // Retrieve stored password and check user status
            string query = "SELECT user_password, user_status FROM user_table WHERE
user_username = @username";

            using (MySqlCommand cmd = new MySqlCommand(query, conn))
            {
                cmd.Parameters.AddWithValue("@username", receivedUsername);
                using (MySqlDataReader reader = cmd.ExecuteReader())
                {
                    if (reader.Read())
                    {
                        string storedPassword = reader["user_password"].ToString();
                        int userStatus = Convert.ToInt32(reader["user_status"]);

                        if (userStatus == 0)
                        {
                            MessageBox.Show("Your account is blocked. Contact an
administrator.", "Account Blocked", MessageBoxButtons.OK, MessageBoxIcon.Error);
                            this.Close();
                            return;
                        }

                        if (storedPassword == enteredPassword)
                        {
                            MessageBox.Show($"Welcome, {receivedFullname}! You have
successfully logged in.", "Login Successful", MessageBoxButtons.OK,
MessageBoxIcon.Information);
                            // Open the Dashboard
                            dashboard dashboardForm = new dashboard();
                            dashboardForm.Show();
                        }

                        else
                        {
                            failedAttempts++;

                            if (failedAttempts >= maxAttempts)
                            {
                                reader.Close();
                                BlockUser(); // Block the user
                                return;
                            }

                            MessageBox.Show($"Incorrect password. Attempts left:
{maxAttempts - failedAttempts}", "Login Failed", MessageBoxButtons.OK,
MessageBoxIcon.Error);
                        }
                    }
                    else
                    {
                        MessageBox.Show("User not found.", "Login Failed",
MessageBoxButtons.OK, MessageBoxIcon.Error);
                    }
                }
            }
        }
        catch (Exception ex)
        {
            MessageBox.Show("Error: " + ex.Message, "Database Error",
MessageBoxButtons.OK, MessageBoxIcon.Error);
        }
    }
}

private void BlockUser()
{
    using (MySqlConnection conn = new MySqlConnection(connectionString))
    {
        try
        {
            conn.Open();
            string updateQuery = "UPDATE user_table SET user_status = 0 WHERE
user_username = @username";
```

```
            using (MySqlCommand cmd = new MySqlCommand(updateQuery, conn))
            {
                cmd.Parameters.AddWithValue("@username", receivedUsername);
                cmd.ExecuteNonQuery();
            }

            MessageBox.Show("Too many failed attempts! Your account has been blocked.
Please contact administrator.", "Account Blocked", MessageBoxButtons.OK,
MessageBoxIcon.Warning);
            this.Close(); // Close the form after blocking
        }
        catch (Exception ex)
        {
            MessageBox.Show("Error blocking user: " + ex.Message, "Database Error",
MessageBoxButtons.OK, MessageBoxIcon.Error);
        }
    }
}
```

IT16 (6717) - Task 2: Deterrence Mechanism



Deterrence helps prevent bad actions, like hacking or unauthorized access, by making the consequences seem too risky or difficult. It works by discouraging people from doing something wrong because they know it might be hard or they might get caught.

One example of deterrence is CAPTCHA. CAPTCHA is something that is used on websites to make sure that a user is human, not a robot or a bot. It asks you to type letters from a blurry image or click on pictures that match a description. This makes it hard for bots (automated programs) to access the website. If a hacker tries to break in, CAPTCHA tells them the website is protected and that trying to hack it and using of automated bots won't be easy. This makes hackers less likely to even try.

So, deterrence works by making harmful actions harder or more risky, which stops people or bots from attempting them.