

Dear students,

In this activity, you'll get to practise using control statements (particularly if...else statements). Many of you had attempted the first activity and had done a decent job, so, let's keep the momentum going and soon programming will become second nature to you.

Scenario

You're tasked with building a user authentication module for an app.

Part 1 - Basics (variable declaration and I/O)

1. Create two variables - username and password - with the appropriate data types.
2. Get the inputs for these two variables. This part is similar to account creation, where you create a new account with a username and a password.
3. Create two new variables to store the username and password that the user will enter when trying to login. Note: Please make sure that these are stored in separate variables and that you don't rewrite the variables you created and read in steps 1 & 2.
4. Read the values for these two variables using cin.

Part 2a - Intermediate (boolean operations and simple if)

1. Inside an if statement, check two conditions - whether the two usernames match and whether the two passwords match.
2. Since both have to match, we need to combine the conditions using the && (and) operator.
3. If both conditions are true, inside the if block, print a message that says something like, "Login success"
4. If either the username or the password is wrong, then the condition will be false, so, include an else block to print, "Incorrect username or password"

Multiple conditions syntax

```
if((condition1) && (condition2))
{
    // If both conditions are true
}
else
{
    // Even if one of the two conditions is false
}
```

Part 2b - Intermediate (nested if)

1. Compare the two usernames - the first one entered during registration and the second one entered during login.
2. If they match, use a nested if (an if statement inside an if block, see syntax below) to now check the passwords.
3. If the passwords also match, then, print "Login success" to the screen.
4. If the passwords don't match, then write an else block to print something like "Incorrect password".
5. That is the end of the overall if block. Now, if the username itself is wrong, then just print a message inside an else block corresponding to the outer if saying that the username is incorrect.

Nested if syntax

```
// Some code before the if block
if(condition1)
{
    // Some additional code if needed
    if(condition2)
    {
        // Code to execute if both condition 1 & 2 are true
    }
    else
    {
        // Code to execute if condition 1 is true but condition 2 is false
    }
    // Some additional code if needed
}
else
{
    // Code to execute if condition 1 is false
}
```

Part 3 - Advanced (combining if statements with functions)

1. Let's use the code from 2a instead of 2b (generally, it's better to avoid nested control statements whenever possible to make the code more clear and readable).
2. Instead of checking the conditions directly inside the if statement, create a function called `checkCredentials()` that takes in four strings as parameters - the correct username, the entered username, the correct password, and the entered password. This function should return a boolean (true or false) based on whether the login details are correct or wrong
3. Instead of performing the comparisons inside the if statement, call the functions to do it, e.g.,

```
if(checkCredentials(corrUname, entUname, corrPwd, entPwd))  
{  
    // Login success  
}
```

4. (Bonus) Instead of direct cout statements inside the if block and the else block to display the success or failure messages, try creating separate functions, one called onLoginSuccess(), which doesn't need to take in any parameters and can return void to display the login success message, and another function called onLoginFailure(), again with no arguments and void return type to print the failure message. This helps to simulate the behaviour of real-world apps that usually call different functions based on certain conditions.

Give this your best shot over the next three days and let me know if you have any questions. Feel free to use reference materials, including the notes uploaded to GCR, but please do try out the code on your own and don't just get ChatGPT or Gemini or Claude or any other AI to write the code for you. It's okay to struggle and make mistakes as you're learning, don't bypass that process as it'll be of no use to you.

Happy coding and enjoy your holidays!

Kind regards,
Walter