Programming Fundamentals II

Lab 5: Assignment

Lab Guidelines:

- Feel free to utilize **any IDE** for completing this laboratory assignment.
- This lab comprises **Two problems** that necessitate resolution.
- Please ascertain that your code adheres to proper formatting and is adequately commented.
- Submit the code for each problem under its corresponding exercise number in a .java.(e.g Exercise1.java). **No need for compression (.zip or .rar); submit only the code file (e.g Exercise1.java)**

Note: *If you have any inquiries, please feel free to reach out to us via the discussion platform accessible to participants of this lab.*

Exercise 1: Program Calculates Factorials

Objective:

Factorials are used frequently in probability problems. The factorial of a positive integer n (written n! and pronounced “n factorial”) is equal to the product of the positive integers from 1 to n. **Write an application that evaluates the factorials of the integers from 1 to 5**.

Display the results in tabular format. What difficulty might prevent you from calculating the factorial of 20?

Hints:

- Use nested for loops in this exercise.
- The inner for loop should compute the factorial.
- Your output should appear as follows:

Output Sample :

```
X       X!

1       1
2       2
3       6
4       24
5       120
```

Exercise 2: User Authentication System

Objective:

Create a Java program that simulates a simple user authentication system using a `do-while` loop. The program will prompt the user to enter a username and password. If the credentials are correct, the user will be granted access. If the credentials are incorrect, the user will be prompted to try again. The system will provide feedback on each attempt.

Requirements

1. User Prompt:
    - The program should prompt the user to enter their username and password.
2. Validation:
    - The program should check if the entered username and password match the predefined credentials.
3. Feedback:
    - If the credentials are correct, display a welcome message.
    - If the credentials are incorrect, display an error message and prompt the user to try again.
4. Looping:
    - Use a `do-while` loop to ensure the user is prompted at least once.
    - Continue prompting the user until the correct credentials are entered.

Predefined Credentials:

- Username: `admin`
- Password: `password123`

End of Lab!