Name: _____

Decisions
02a1 – Practice Exercise

Overview

These series of exercises introduce you to the advanced techniques to make decisions in Java.

We will be doing these exercises inside the main method. It is generally not good programming practice to only use a main routine, but we will do this for now for the purpose of demonstration and ease of learning. Later we will do these operations inside classes where they belong.

Part 1: Nested if Statements

Write a class called **NestedIf** with a **main** method that accepts an integer number then displays information about the number. Display a message for each of these decisions.

- Check and report that the number is positive or negative.
- Then, should the number be negative, check and display if the number is an even or odd number.
- Then, should the number be positive, check and display that the number is evenly divisible by 4.

Do this in one nested if-statement. Before typing the Java code, **show the nested if statement in the space below in pseudocode (more English than Java):**

Part 2: Logical Operators

Write a class called **Range** with a **main** method that accepts one integer number. Using logical operators and **one if-statement** say if the number is:

- Less than zero
- Greater than 0 and less than 10
- Greater than 10 and less than 20
- Greater than 20 and less than 30
- Greater than 30 and less than 40
- Greater than 40

NOTE: although this is technically one if-statement, you will need to use multiple else-if statements inside this if-statement.

What happens when the entered number is equal to 0, 10, 20, 30, or 40?

Write a new class called **Range2** that fixes this problem by ensuring that all numbers are included in the logic. Do not add additional conditions; only modify the existing logical operators. You can arbitrarily choose the operators you want to change, just make sure that a number is only included in one test condition.

Part 3: switch Statement

Write a class called **Switching** with a **main** method that accepts an integer number then displays what the number was. Use a switch statement to print if the number according to the following table.

Number entered	Print
0	Number is zero
1	Number is one
2	Number is two
3	Number is three
Negative or greater than 3	Number is negative or greater than 3

Part 4: Loops

This program will give you practice with loops in Java.

Write a program, Factorial.java, which allows a user to enter a number from 0 to 40, inclusive.
Validate the number entered is between the limits expected. If it is not, present the user with an informative message of what they did wrong and inform them of the correct values. Allow the user to enter values until a correct value is entered. Be efficient with this validation, no priming reads.

Once a valid number is entered, calculate the factorial of that number and print out the user's number along with the factorial of that number. Since there is no factorial in the Math class, you need to create a loop that will calculate the factorial of a number. For example 4! = 1*2*3*4 = 24. Also factorial of 0 is 1, also 1! = 1.

After the factorial is printed, ask the user if they want to enter another number. If they answer with an affirmative response, loop the entire program and ask them to enter another number. The program stops when the user answers with a negative response for this question.

Instructor / TA signoff: _____