COMP 2243   **Fall 2022**   **Assignment 4**   **Total 20 points**

1. Write a program that prompts the user to enter a positive integer. The input number should be validated, print an error message if the input number is negative. The program then proceeds to do the following with **Multiple-Selection structure (if … else if …else):**

    - If the number (n) is single digit, calculate 2^n and print the result.

    - If the number (n) is double digit, retrieve the first digit (b) and the second digit (p), calculate b^p and print the result.

    - If the number (n) is triple digit, retrieve the first, the second, and the third digit, determine which is the largest and print the result.

    - If the number (n) has more than 4 digits, print it with one-thousand separator.

Sample Run with invalid input:
```
Enter a positive integer: -342

Invalid input, positive integer only!
```

Sample Run with valid input single-digit:
```
Enter a positive integer: 6

Single-Digit: 6

2 to 6's power: 64.0
```

Sample Run with valid input double-digit:
```
Enter a positive integer: 35

Double-Digit: 35

First Digit: 3
Second Digit: 5

3 to 5's power: 243.00
```

Sample Run with valid input triple-digit:
```
Enter a positive integer: 794

Triple-Digit: 794

First Digit: 7
Second Digit: 9
Third Digit: 4

Largest digit: 9
```

Sample Run with valid input more than 4 digits:
```
Enter a positive integer: 45678

This number has 4 or more digits: 45,678

We will learn how to use a loop to process it later.
```

2. A software company offers three types of services: development, training, and consulting. The hourly rates are shown below.

Service Type	Service	Hourly Rate
1	Development	$65.50
2	Training	$50.50
3	Consulting	$80.00

Write a program that asks the user to enter the service type and the hours spent, then calculates and outputs the service charge before tax.

    a. It is required to use the **switch selection** structure to select the service number and use the default case to handle the invalid service number.

    b. Hours spent must be validated. Print an error message if an invalid value is entered.

    c. Use **System.out.printf** or **String.format** method to format the output.

Sample Run with invalid input:
```
1 --- Development
2 --- Training
3 --- Consulting

Enter the service type number: 5

Invalid selection, enter 1, 2, or 3.
```

Sample Run with invalid input:
```
1 --- Development
2 --- Training
3 --- Consulting

Enter the service type number: 3
Enter the hours spent: -2.5

Invalid input, the hours spent must be greater than zero.
```

Sample Run with valid input:
```
1 --- Development
2 --- Training
3 --- Consulting

Select a number: 1
Enter the hours spent: 40.5

Development Service

Development charge before tax: $2,652.75
```

Due: Wednesday, 9/21/22

-     To receive full credit, the assignment must be submitted by the due date.
-     Late submissions will incur a penalty of 5% per day.
-     Upload the source code files to D2L.

Style, form, documentation, naming convention, and more

Each program should have a file header section. /* * Author: Your name * Date: Date of completion * Assignment: Assignment # NameOfSourceCode.java * Description: The program description */	Up to 5% deduction
Each program should be written with the appropriate form and style. Use indentation, blank line, and comments to make the source code easy to read.	Up to 5% deduction
Use Java naming convention and meaningful names to name the classes, methods, variables, constants, and other identifiers in the programs.	Up to 5% deduction
Format the output appropriately	Up to 5% deduction