CSGE601021
Dasar-Dasar Pemrograman 2
(Foundations of Programming 2)
Tutorial Lab 03
Strings and Number Conversion

Build a Java project (see the template below) with one public class which has a method **main** that carries out the following steps:

1. Ask the user to input a positive decimal integer less than or equal to Integer.MAX_VALUE. Validate the user's input to make sure that the user enters a valid number. Stop if the user enters the sentinel "QUIT".
2. Call a static method **dec2hex** to convert the decimal number to a hexadecimal number string using a **for** loop and the mod (%) operator. The new **switch** statement must be used here.
3. Display the hexadecimal number string.
4. Repeat

Like in Lab 02, you should use the **Input** dialog window and the **Message** dialog window from the class **JOptionPane.** See the input-output examples below. You need to import the class JOptionPane with the command:

```
import javax.swing.JOptionPane;
```

You are not allowed to use the method **printf**.

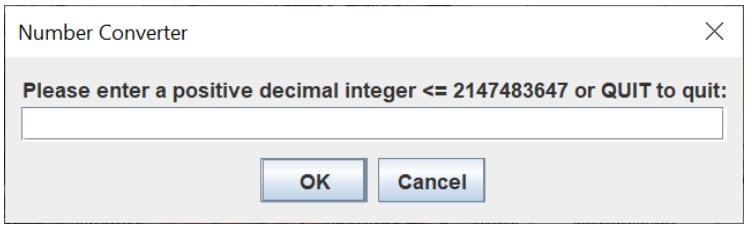
Keep your program as simple as possible. Remember the KISS principle.

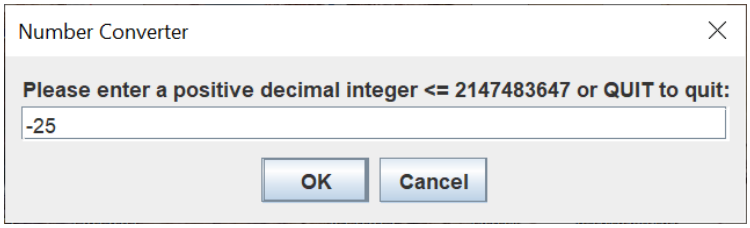
Hint:
How do we get a hexadecimal string from a positive decimal integer? The easiest method uses integer division by 16 on successive quotients and then collects the remainders. It is best illustrated by an example. Consider the decimal number 956.

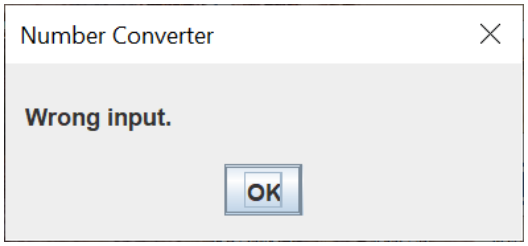
- 956 divided by 16 gives the quotient 59 and remainder 12 or C.
- 59 divided by 16 gives the quotient 3 and remainder 11 or B.
- 3 divided by 16 gives the quotient 0 and remainder 3.

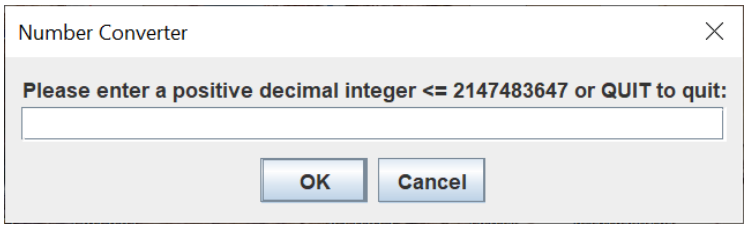
Stop at reaching a quotient of 0. The hexadecimal number equivalent to 956 is given by concatenating the remainders, in reverse (so the last remainder is the most significant digit and the first remainder is the least significant digit). In this example: "3BC".

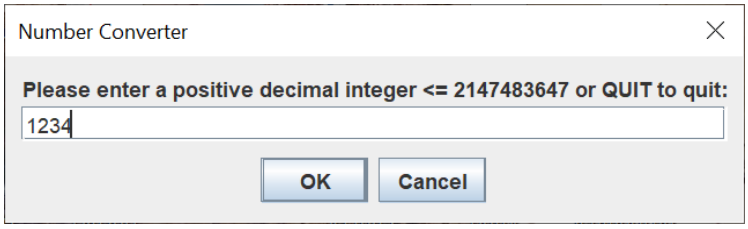
Examples of program execution with user's interaction:

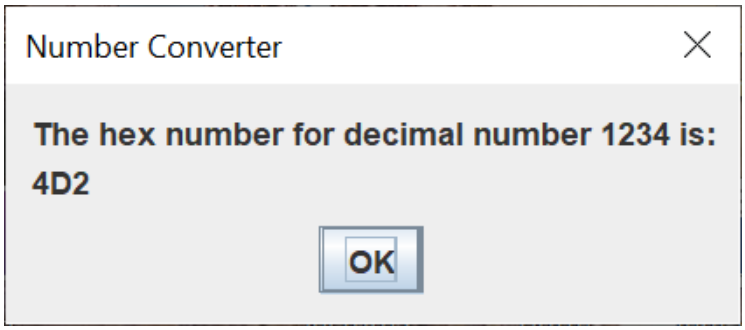


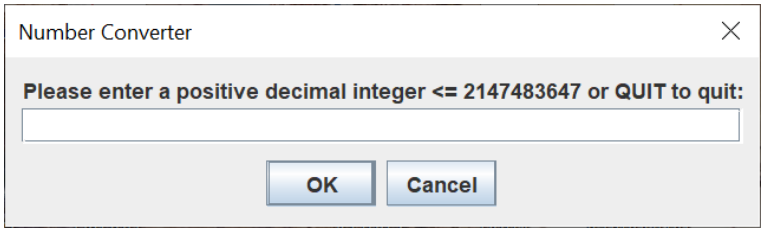


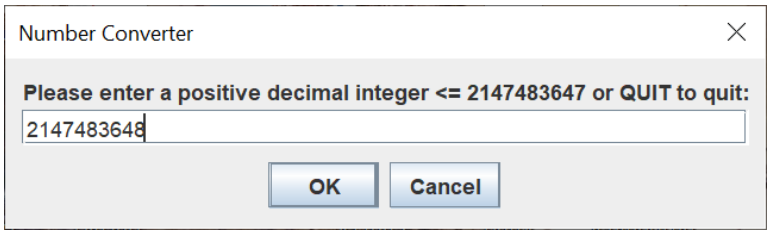


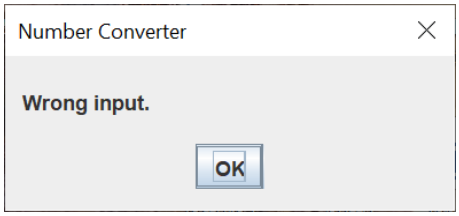


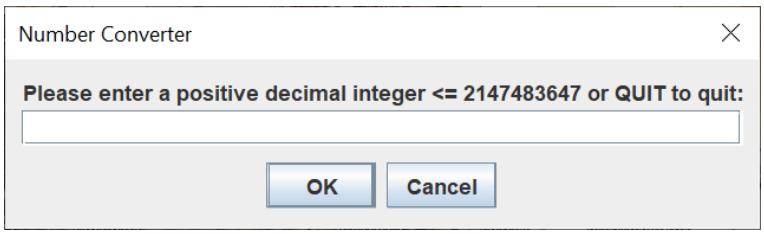

Number Converter
Please enter a positive decimal integer <= 2147483647 or QUIT to quit:
1234
OK
Cancel

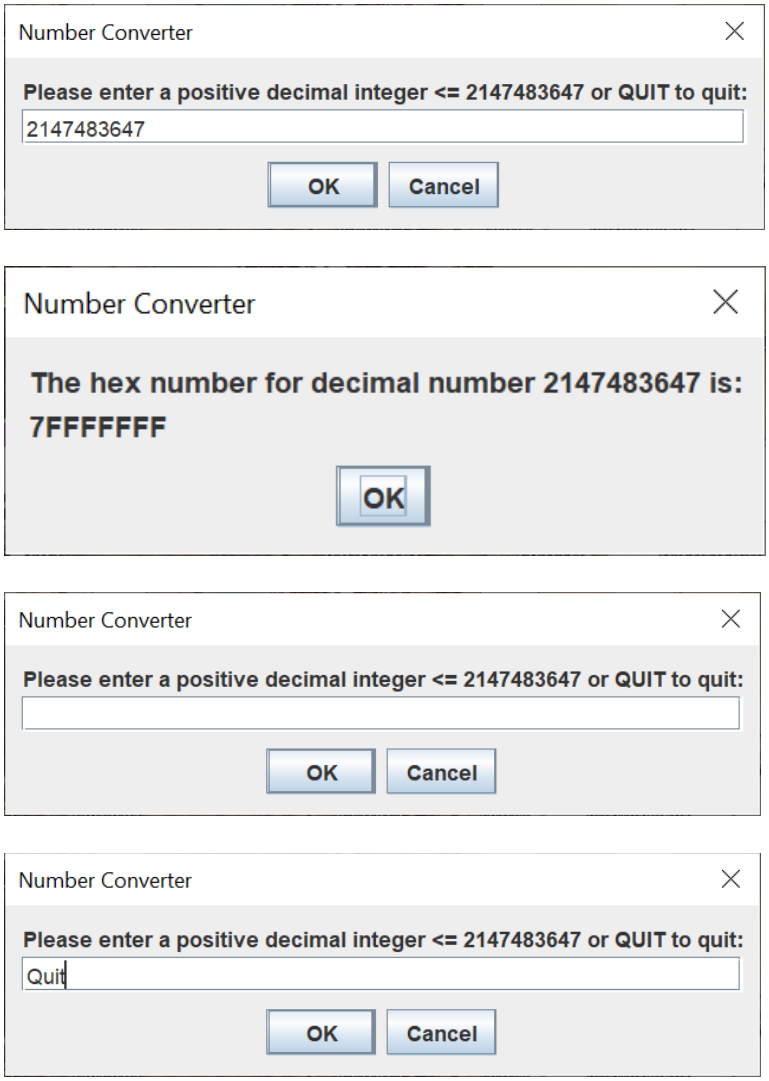

Number Converter
The hex number for decimal number 1234 is:
4D2
OK


Number Converter
Please enter a positive decimal integer <= 2147483647 or QUIT to quit:
OK
Cancel


Number Converter
Please enter a positive decimal integer <= 2147483647 or QUIT to quit:
2147483648
OK
Cancel


Number Converter
Wrong input.
OK


Number Converter
Please enter a positive decimal integer <= 2147483647 or QUIT to quit:
OK
Cancel



Use the following program template:

```java
/**
 * Convert a decimal integer into a hexadecimal number
 * @author ...
 */
import javax.swing.JOptionPane;

public class NumberConverter {

    public static void main(String[] args) {

        String inputString, resultString;

        boolean valid = false;
        boolean keepGoing = true;
        long decLong = 0;  //input from user, can be a
                           //very big number


        while (keepGoing) {
            inputString = JOptionPane.showInputDialog(null,
              "Please enter a positive decimal integer <= "
              + Integer.MAX_VALUE + " or QUIT to quit:",
              "Number Converter",
              JOptionPane.PLAIN_MESSAGE);


            //
            // your code here, for validating input from user
            //

            if (valid) {
                int decInt = (int) decLong;

                resultString = "The hex number for decimal number "
                  + decLong + " is:\n" + int2hex(decInt);

                JOptionPane.showMessageDialog(null, resultString,
                  "Number Converter", JOptionPane.PLAIN_MESSAGE);
            }
        }
    }

    public static String int2hex(int decInt){
        // Convert decimal to hex
        String hexStr = "";

        // your code here; must use the new switch

        return hexStr;
    }
}
```

Marking components:

Code correctness	90%
Clear comments	10%

Through the link at SCeLE, submit all your project files (1 project folder), zipped into a file: lab03_<class>_<TACode>_<YourName>_<YourNPM>.zip

Happy Programming, Selamat Mengerjakan!

'Met Ngoding! ☺

L.Y.Stefanus & the Asdos Team