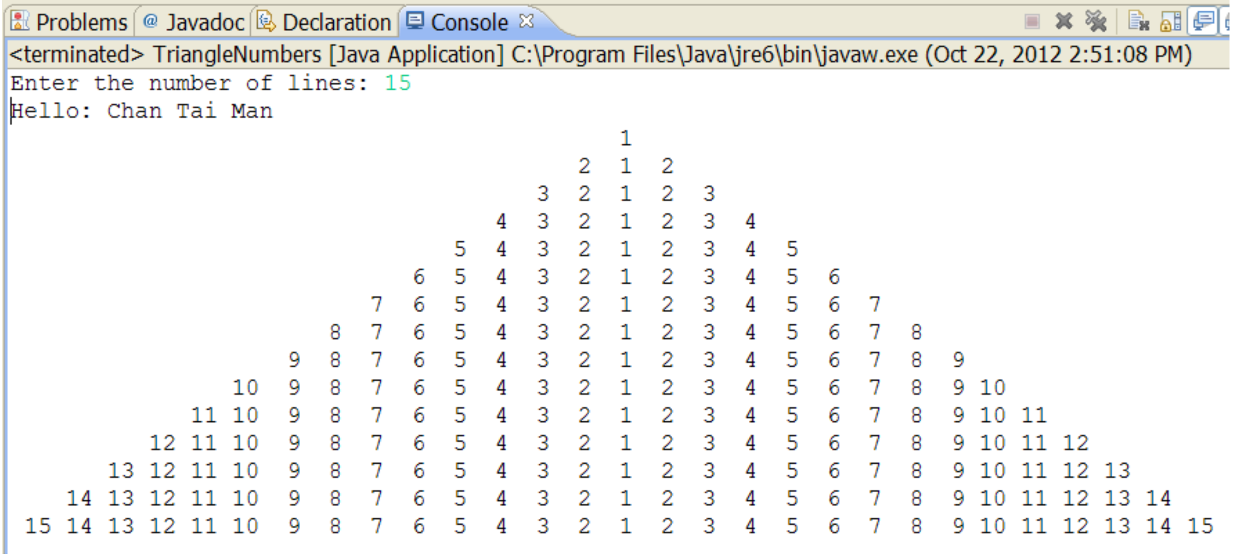
The Hong Kong Polytechnic University
Department of Electronic and Information Engineering

EIE3320 Tutorial 1: Java Programming Basic

(Deadline for Submission: Check the course information)

1. **(Assignment)** Use the statement `for` to write a program that prompts the user to enter an integer from 1 to 15, and displays a pyramid as shown in the following sample run (the input is 15):



```
<terminated> TriangleNumbers [Java Application] C:\Program Files\Java\jre6\bin\javaw.exe (Oct 22, 2012 2:51:08 PM)
Enter the number of lines: 15
Hello: Chan Tai Man
                                            1
                                         2  1  2
                                      3  2  1  2  3
                                   4  3  2  1  2  3  4
                                5  4  3  2  1  2  3  4  5
                             6  5  4  3  2  1  2  3  4  5  6
                          7  6  5  4  3  2  1  2  3  4  5  6  7
                       8  7  6  5  4  3  2  1  2  3  4  5  6  7  8
                    9  8  7  6  5  4  3  2  1  2  3  4  5  6  7  8  9
                10  9  8  7  6  5  4  3  2  1  2  3  4  5  6  7  8  9 10
             11 10  9  8  7  6  5  4  3  2  1  2  3  4  5  6  7  8  9 10 11
          12 11 10  9  8  7  6  5  4  3  2  1  2  3  4  5  6  7  8  9 10 11 12
       13 12 11 10  9  8  7  6  5  4  3  2  1  2  3  4  5  6  7  8  9 10 11 12 13
    14 13 12 11 10  9  8  7  6  5  4  3  2  1  2  3  4  5  6  7  8  9 10 11 12 13 14
 15 14 13 12 11 10  9  8  7  6  5  4  3  2  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
```

2. Write a Java program that prompts the user to enter time in seconds (e.g., 1000000) and displays the equivalent number of hours and remaining minutes and seconds (***Hints***: you may need to use the remainder operator "%" in Java). Here is a sample run:

```
Enter the number of seconds: 1000000
1000000 seconds is 277 hours, 46 minutes, and 40 seconds.
```

3. A triangular number is defined as $1+2+3+\cdots+n$ for n = 1, 2, and so on. Accordingly, the first few triangular numbers are 1, 3, 6, 10, …. Write a method that returns a triangular number. The signature of the method is as follows:

```
public static int getTriangularNumber(int n)
```

Write a test program that displays the first 100 triangular numbers with 10 numbers on each line. Here is a sample run:

```
The first 100 triangular numbers are:
1 3 6 10 15 21 28 36 45 55
66 78 91 105 120 136 153 171 190 210
231 253 276 300 325 351 378 406 435 465
496 528 561 595 630 666 703 741 780 820
```

```
861 903 946 990 1035 1081 1128 1176 1225 1275
1326 1378 1431 1485 1540 1596 1653 1711 1770 1830
1891 1953 2016 2080 2145 2211 2278 2346 2415 2485
2556 2628 2701 2775 2850 2926 3003 3081 3160 3240
3321 3403 3486 3570 3655 3741 3828 3916 4005 4095
4186 4278 4371 4465 4560 4656 4753 4851 4950 5050
```

Hints: Use for-loop and the remainder operator "%".

5. Write a method that returns the number of days in a given month. The method's signature is as follows:

   ```
   public static int daysInMonth(int month)
   ```

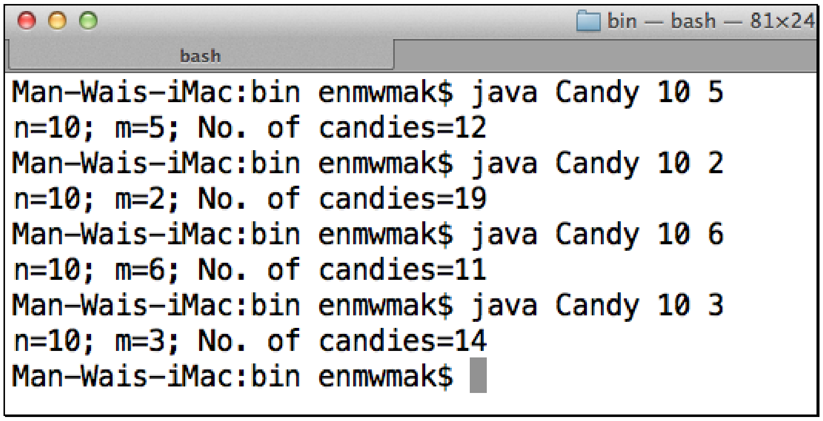
   Let 1 represents Jan and 2 represents Feb and so on, and ignore leap years. Write a test program that prompts the user to enter a month as an integer and displays the number of days in that month. Here is a sample run:

   ```
   Enter a month (January = 1): 7
   July has 31 days.
   ```

   Hints: Use switch-case statements.

6. You may not believe but the following is a question of an Admission Test of a primary school in Hong Kong: You buy ten candies from a candy shop. If you return two sweet wrappers, you get one candy free. If so, how many candies can you get?

   Please write a Java program to help these poor kids to answer this question. To generalize the solution, your program should be able to accept different values of *n* and *m* as input, where *n* = 10 and *m* = 2 in this question. To avoid infinite number of answers, you may assume that each candy has exactly one foil and it is not allowed to cut the foils. Here are some example outputs of the program.



```
Man-Wais-iMac:bin enmwmak$ java Candy 10 5
n=10; m=5; No. of candies=12
Man-Wais-iMac:bin enmwmak$ java Candy 10 2
n=10; m=2; No. of candies=19
Man-Wais-iMac:bin enmwmak$ java Candy 10 6
n=10; m=6; No. of candies=11
Man-Wais-iMac:bin enmwmak$ java Candy 10 3
n=10; m=3; No. of candies=14
Man-Wais-iMac:bin enmwmak$
```

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