ESC101 : Fundamental of Computing

Lab 5 for 4th September 2008

1. **Adding two long numbers correctly :** (marks = 10)
   We spent may lectures on types, expression of mixed types, their evaluation, range of various numeric types. One point which was emphasized multiple times was that a numeric type, say `long` has a limit on the maximum value which it can store. So we have to be very careful when we perform an arithmetic operation on two variables of numeric types. For example, if we have two variables `x,y` of type long, and we want to print the sum of `x` and `y`, then the following code may give error if the sum of these variables is beyond the range of `long`. (you may compile and execute it to convince yourself).

   ```
   long x = 9000000000000000000L; long y = 9000000000000000012L;
   long sum = x+y;
   System.out.println(sum);
   ```

   For your information, the largest positive value of `long` is 9223372036854775807. You have to write a program which prints the sum of any two variables `x` and `y` of type long. Your program **must** work correctly for any positive `long` values assigned to `x` and `y`.
   Hint : use two `long` variables for storing *upper half* and *lower half* of `x`, and similarly for `y`.

2. **Printing numbers in words :** (marks=10)
   Write a program in Java to print all numbers from 20 to 99 in words. Output should look like as follows.

   ```
   20 : Twenty
   21 : Twenty one
   22 : Twenty two
   ..   ..
   ..   ..
   98 :  Ninety eight
   99 :  Ninety nine
   ```

   You have to use a for loop with two switch statements in its body, but the number of cases in each switch statement should not exceed 10.

Note : one mark should be deducted from each question if the code is not properly indented. The students are encouraged to write comments to improve the readability of the code. For the first question, only **5 marks** should be awarded if the logic is correct but the program does not work for some input. Furthermore, no marks should be given if the logic is also incorrect.