

## ESC101 : Fundamental of Computing

Lab 5 for 3rd September 2008

### 1. Simplest Form of a Rational Number: (marks = 10)

A rational number  $\frac{a}{b}$ ,  $b \neq 0$  is in simplest form if  $a$  and  $b$  have no common divisor. Declare three variables **a**, **b** and **c** of type **long**, assign them some positive values. Write JAVA code to find the simplest form of  $(a \times b)/c$ . For example, for  $a = 4$ ,  $b = 9$  and  $c = 24$ , the simplest form for  $(a \times b)/c$  would be  $3/2$ , so the program should print :

**Numerator is = 3**

**Denominator is = 2**

Your code **must** work for all values of **a**, **b**, **c** such that the simplest form of  $(a \times b)/c$  has numerator as well denominator within the range of **long**. For example, if **a=40000000000L**, **b=1200000000L**, **c=88000000000000L**, the program should print

**Numerator is = 6000000**

**Denominator is = 11**

**Hints:** 1. use the concept of gcd.

2. make sure that for any input whose output is indeed *valid* output (numerator as well as denominator are less than the largest number stored in **long**), your code does not generate a number at any intermediate stage which is larger than the range of **long**.

### 2. Program to Simulate a Calculator: (marks=10)

Declare two variables **a** and **b** of type **int**, and a variable **c** of type **char**. Initialize **a** and **b** with some integer values. Assign to **c** some character from set  $\{+, -, *, /, \%\}$ . Write a JAVA code which will consider **a** and **b** as two operands and **c** as operator and compute the value obtained by applying operator **c** on operands **a** and **b**. We follow the convention that **a** is the first operand and **b** is the second operand. For example, if **a** is 6, **b** is 2 and **c** is **-**, then the output should be 4. Similarly, if **a** is 23, **b** is 7 and **c** is **/**, then the output should be 3. **Hint:** Use switch statement.

**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, deduct 3 marks if the code does not work for all the inputs with valid output (read the question to understand the notion of input with valid output)