ESC101 : Fundamental of Computing

Lab 2 for 8th August 2008

1. **Printing a pattern :**
   The objective of this assignment is to invoke the artist in you, "the ASCII artist" in you, to be more precise.("ASCII Art" - where normal screen characters are used to create artistic objects.)

   (For more about ascii art, visit `http://en.wikipedia.org/wiki/ASCII_art`)

   You are required to make an ASCII bird using your JAVA knowledge. A bird, like this -

```
    .-.
   /'v'\
  (/   \)
 ==”=”===
```

   Use the `System.out.println()` method and keep in mind, that -

   (1) `System.out.println`("/"); generates

   /

   and

   (2) `System.out.println`("\\"); generates

   \

   because the first '\' is used as an escape character. To print few special characters like (") and (\), you need to append an extra '\' before each such character in the `System.out.println()`.

2. **Parity of an integer :**
   Declare and initialize a variable `num` of type `int`. Write a Java program to print `true` if `num` is even and `false` if `num` is odd.

   You are **NOT** allowed to use `if` statement.

   You may use the % operator.

3. **Matrix arithmetic :**
   Write a program to compute the matrix multiplication $C = A \times B$ of two 2×2 matrices, A and B.

   Declare and initialize 4 variables `a11`, `a12`, `a21`, `a22` of type `int` corresponding to the 4 elements of matrix A. Declare and initialize 4 variables `b11`, `b12`, `b21`, `b22` of type `int` corresponding to the 4 elements of matrix B. Declare and initialize 4 variables `c11`, `c12`, `c21`, `c22` of type `int` corresponding to the 4 elements of output matrix C. Now, calculate the values of `c11`, `c12`, `c21`, `c22` according to the equation given below.

$$\begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix} \times \begin{bmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{bmatrix} = \begin{bmatrix} a_{11}b_{11} + a_{12}b_{21} & a_{11}b_{12} + a_{12}b_{22} \\ a_{21}b_{11} + a_{22}b_{21} & a_{21}b_{12} + a_{22}b_{22} \end{bmatrix}$$

   Print the output in the following manner:
   [1 2] * [2 1] = [10 7]
   [3 4] [4 3] [22 15]