Homework 2

1. Write regular expressions to capture the following regular languages:

   (a) The set of binary strings that either contain an even number of 0's, or contain an odd number of 1's (or both).

   (b) All strings of lower case letters where all five vowels appear once and are in alphabetical order (a-e-i-o-u). (No, I don't believe that y is a vowel.) Feel free to use ranges to simplify, i.e. [b-d] means any of the letters b,c, or d will be accepted, so it is an OR of them.

   (c) Comments that consist of a string surrounded by /* and */, with no intervening */ allowed unless it appears within double quotes. (Again, feel free to use shortcuts for letters or sets of characters if it will simplify - just define them carefully so I know what you mean.)

2. Write a DFA or NFA to recognize each of the languages described in each part of problem 1.

3. (a) Show the NFA that results from applying the standard construction we saw in class (or you can find in the book in Figure 2.7) to the regular expression: $digit\ letter(digit|letter)*$.

   (b) Convert your NFA to a DFA (see Example 2.14 in the book).