Homework set 3: Regular languages — due Monday 29 January

1. (20 pts.) In each case, write the set of strings of length 5 in the language of the following regular expressions:
   
   (a) \(a^* (b + cc)\)
   
   (b) \(a^* b^*\)

2. (20 pts.) Show by means of a counter-example that the following statement is false: “For any language \(L\), the languages \((LL)^*\) and \(L^* L^*\) are the same.”

3. (30 pts.) Write regular expressions and draw deterministic finite automata for the following sets of strings over the alphabet \(\{a, b\}\).
   
   (a) The strings that do not end in \(bb\)
   
   (b) The strings containing exactly one occurrence of \(bb\)

4. (30 pts.) Write a regular expression and draw a deterministic finite automaton for comments in C. These are the strings that (i) begin with /*, (ii) end in */ without overlap (so */ is excluded), and (iii) have no other occurrence of */.