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) $a^\star(b+cc)$

   (b) $a^\star b^\star$

2. (20 pts.) Show by means of a counter-example that the following statement is false: "For any language L, the languages $(LL)^\star$ and $L^\star L^\star$ 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 expressiona 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 `*/`.