Due at the beginning of class on April 15th.

Warning: some of the problems require thought - do not wait until the last
day to start working on them! If you cannot come up with algorithms that run
in the required time, then provide (correct) slower algorithms for partial credit.
Write your answers using pseudo-code in the same style as the textbook. These
make the algorithm description precise, and easy to read (as opposed to code
in C or some other language).

1. Do problem 24-1 in pages 614-615 of the textbook; do parts (a), (b) and (c).

2. Construct the string-matching automaton for the string aaaba, when the
alphabet \( \Sigma \) equals \{a,b\}.

3. Do problem 34.1-1 in page 978 of the textbook.

4. Do problem 34.2-6 in page 983 of the textbook.

5. Do problem 34.2-7 in page 983 of the textbook.

6. (For graduate students only) We are given a text \( T[1..n] \) and a pattern
\( P[1..m] \), and also an integer \( k, 1 \leq k \leq m \). We want to output every shift \( s \) of the
pattern such that under such a shift, the first \( k \) (and possibly more) characters of
the pattern all match the text. Modify the automaton-based algorithm discussed
in class, to solve this problem. (Hint: The automaton can be the same as the
one we covered in class.)