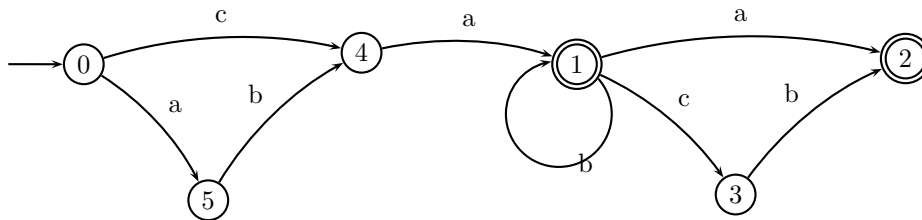


Exercise sheet 1

(Due: Monday, 13. January by the beginning of class)

1. Consider the following finite-state machine:



- (a) Which of the following sequences does it accept? (1) *ab* (2) *ca* (3) *cba* (4) *cabbb* (5) *ababa* (6) *bacb* (7) *cabcb* (8) *ababcbc* (9) ϵ (10) *cabbbab*
- (b) Write a regular expression which characterizes the same language as this network.

2. Draw an FSTN that will recognize well-formed English number names up to *ten thousand* – for example, *five hundred, four thousand seven hundred and one*, etc.
3. Devise a FSM which characterizes the same language as the regular expression and draw it as a FSTN:

$$(a|(bab))^*(b|a)$$

4. Consider the following transition table, where “ ϵ ” denotes an empty transition):

	a	b	c	d	e	ϵ
S0.	S1					
S1		S2		S1		S3
S2			S3			
S3					S4:	
S4:						

- (a) Draw it as an FSTN.
- (b) Draw an equivalent FSTN without any empty transitions.
- (c) If the ϵ -free FSTN you obtained in (b) is non-deterministic, draw an equivalent deterministic one.