EDAN65: Compilers
Computer Science
Lund University

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E02: Regular expressions and scanning

solutions

Note that there are often several equivalent ways of writing a regular expression.

E02-1: Solution: `[0-9]+`

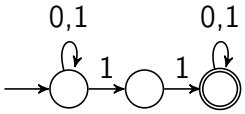
E02-2: Solution: `0|1(0|1)*`
Alternative solution: `0|1[0-1]*`

E02-3: Solution: `[0-9]+([\+\*][0-9]+)*`
Some examples: `0`, `44+9`, `3+56*23`, `70*4*156`

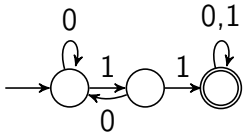
E02-4: Solution:
a) `[0-1]*11[0-1]*`
b) `0*(10+)*(1|`ϵ`)`
`Alternative solution to b): 0*(10+)*1?`

E02-5: Solution:

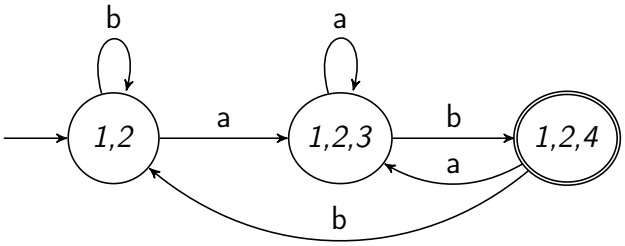
a)



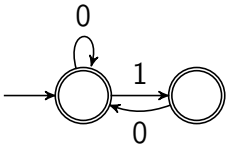
b)



E02-6: Solution:



E02-7: Solution:



Note that both states are final states.

E02-8: Solution:

state	0	1	.	kind	final
0	0	0	0	error	
1	2	2	0		no
2	2	2	3	integer	
3	4	4	0		no
4	4	4	0	float	

The initial state is 1.

E02-9: Solution:

2: `ID = [a-z][a-z0-9]*`
3: `PLUS = "+"`
4: `MINUS = "-"`
5: `INT = [0-9]+`
8: `INT-WITH-EXPONENT = [0-9]+ "e" [+-]?[0-9]+`

E02-10: Solution:

The string `1e+a` will require a 3 character lookahead before accepting `1`.