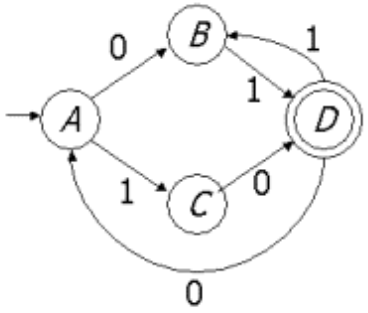
Feedback — Week 2: Regular Expressions

Help Center

You submitted this homework on **Sat 3 Oct 2015 6:25 PM CEST**. You got a score of **3.00** out of **5.00**. You can attempt again, if you'd like.

Question 1

Here is a finite automaton:



Which of the following regular expressions defines the same language as the finite automaton? Hint: each of the correct choices uses component expressions. Some of these components are:

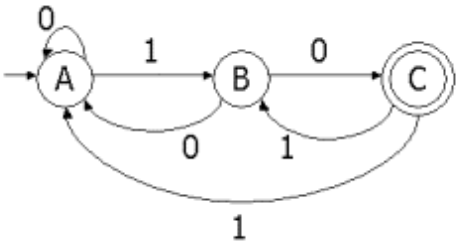
1. The ways to get from A to D without going through D.
2. The ways to get from D to itself, without going through D.
3. The ways to get from A to itself, without going through A.

It helps to write down these expressions first, and then look for an expression that defines all the paths from A to D.

Your Answer		Score	Explanation
((01+10)0+11)*(01+10)(11)*			
((01+10)(11)*0)*(01+10)(11)*	✔	1.00	
(01+10)(0(01+10))*(11)*			
((01+10)(11)*0)*(01+10)			
Total		1.00 / 1.00	

Question 2

When we convert an automaton to a regular expression, we need to build expressions for the labels along paths from one state to another state that do not go through certain other states. Below is a nondeterministic finite automaton with three states. For each of the six orders of the three states, find regular expressions that give the set of labels along all paths from the first state to the second state that never go through the third state.



Then identify one of these expressions from the list of choices below.

Your Answer		Score	Explanation
○ (10)*1 represents the paths from C to B that do not go through A.			
◉ 0*1 represents the paths from A to B that do not go through C.	✖	0.00	This expression represents some of the paths from A to B that avoid C, but misses other such paths, like 101. Remember that you can choose the order in which you number states as you like, in order to make your calculations for this problem as simple as possible.
○ 0^+ represents the paths from B to A that do not go through C.			
○ 1 represents the paths from C to B that do not go through A.			
Total		0.00 / 1.00	

Question 3

Identify from the list below the regular expression that generates all and only the strings over alphabet {0,1} that end in 1.

Your Answer		Score	Explanation
○ 0^+ (0+1)*1			
◉ $(0+1)^+1$	✖	0.00	Although this expression generates only strings of 0's and 1's that end in 1, it cannot generate all of those strings. In particular, it cannot generate the string 1 alone.
○ (0? $+1^+)$*1			
○ (0*1)?			
Total		0.00 / 1.00	

Question 4

Convert the regular expression (0+1)*(0+ε) to an epsilon-NFA, using the algorithm described in the videos. Then, identify the true statement about your epsilon-NFA from the list below:

Your Answer		Score	Explanation
○ There are 10 states.			
○ There are 3 states with more than one arc out.			
○ There are 2 states with more than one arc in.			
◉ There are 14 states.	✔	1.00	
Total		1.00 / 1.00	

Question 5

In this question you are asked to consider the truth or falsehood of six equivalences for regular expressions. If the equivalence is true, you must also identify the law from which it follows. In each case the statement R = S is conventional shorthand for "L(R) = L(S)." The six proposed equivalences are:

1. 0*1* = 1*0*
2. 01∅ = ∅
3. ε01 = 01
4. (0* + 1*)0 = 0*0 + 1*0
5. (0*1)0* = 0*(10*)
6. 01+01 = 01

Identify the correct statement from the list below.

Note: we use φ for the empty set, because the correct symbol is not recognized by Internet Explorer.

Your Answer		Score	Explanation
ε01 = 01 follows from the identity law for concatenation.	✔	1.00	
01+01 = 01 follows from the annihilator law for union.			
01+01 = 01 follows from the commutative law for union.			
(0*1)0* = 0*(10*) follows from the distributive law of concatenation over union.			
Total		1.00 / 1.00	