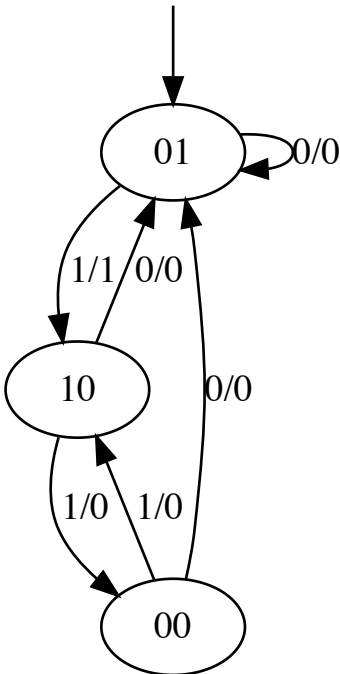


Feel free to check out the [guide](#) that we have prepared to help you in this problem.

Consider the following state diagram of a FSM:



Note that we are using 2-bit integers to represent states.

Let **In** denote the input bit, **Out** denote the output bit, **C1** and **C0** denote the left and right bits of the current state respectively, and **N1** and **N0** denote the left and right bits of the next state respectively. Write boolean expressions for **Out**, **N1**, **N0** in terms of **In**, **C0**, **C1**. Partial credit will be awarded for answers not in simplest terms; for full credit, you must submit the simplest possible answer (i.e. the answer which requires the fewest operations). Note: The answer checker will only accept answers which are sequences of "In", "C1", "C0", "1", "0", and characters among "()*+!". Use **!** for NOT, ***** for AND, **+** for OR, and **()** for grouping and precedence. Spaces are allowed, but will be ignored.

An example answer looks like this: **(!A*!B)+(!C+!D)**

A note on scoring: Your score for this question is computed as follows: First, your solution is compared against the reference solution on all valid inputs (NOTE: This is not necessarily all possible inputs; for example, we can never have a state of 11, so it doesn't matter what your circuit outputs in that case). If there is a mismatch, the solution is scored as 0. Otherwise, your score is computed as $(r+1)/(s+1)$, where **r** is the number of boolean operators in our reference solution, and **s** is the number of boolean operators in the student submission.

Hint: If a state does not exist in the diagram (such as state 11), then we don't care about the next state and output bits from that state. In that case, when writing the state transition table (the table of current state, input, next state, output), the next state bits and output from that missing state can be assigned to either a 0 or a 1, depending on what makes the simplest Boolean expression.

Q1.1:

Out=

?

Q1.2:

N1=

?

Q1.3:

N0=

?

Assessment overview

Total points: 49.44/100

Score: 49%

Question

Value: 10

History:

Awarded points: 0/10

Report an error in this question ?

Previous question

Next question

Attached files

No attached files

Attach a file ?

Attach text ?