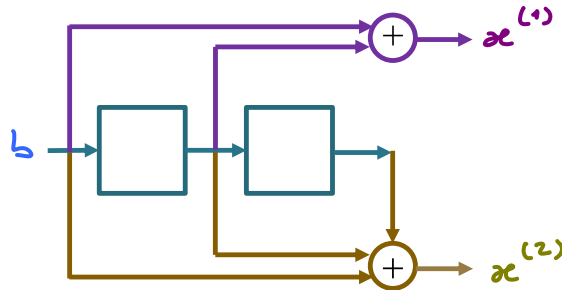


Instructions

1. Separate into groups of no more than three persons.
2. The group cannot be the same as any of your former groups.
3. Only one submission is needed for each group.
4. **Write down all the steps** that you have done to obtain your answers.
You may not get full credit even when your answer is correct without showing how you get your answer.
5. **Do not panic.**

Name	ID
Prapun	555

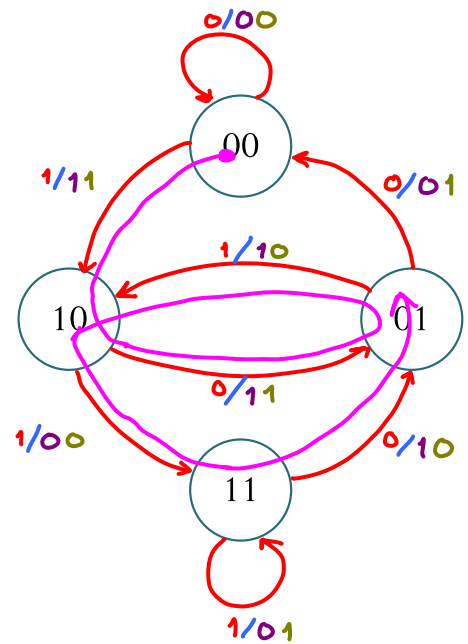
1. Consider a convolution encoder represented by the following diagram



a. Draw the corresponding state (transition) diagram

First, observe that this encoder use a shift register with two FFs which is the same as in the lecture. Therefore, the arrows will be the same as what we had in the lecture

Note, however, that the connections that produce the outputs are different from the encoder in lecture.



b	s ₀	s ₁	x ⁽¹⁾	x ⁽²⁾
0	0	0	0	0
1	0	0	1	1
0	1	0	0	1
1	0	1	1	0
0	1	0	0	1
1	1	1	1	0
0	1	1	0	1

b. Suppose the information input bits (the message bits) are 10110.

Find the corresponding codeword x

i. by using the direct method (filling out the table below)

and

ii. by "tracing" the corresponding path on the state diagram above

see the trace in the diagram above

b	s ₀	s ₁	x ⁽¹⁾	x ⁽²⁾
1	0	0	1	1
0	1	0	1	1
1	0	1	1	0
1	1	0	0	0
0	1	1	1	0

$\underline{x} = [1111100010]$