

1. Consider convolutional encoder as shown in Figure 1.

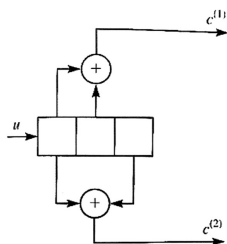
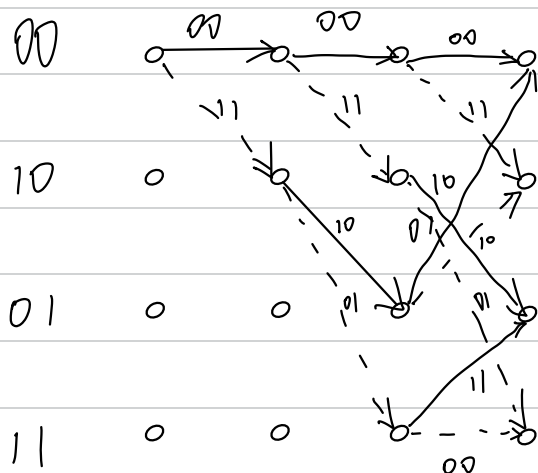
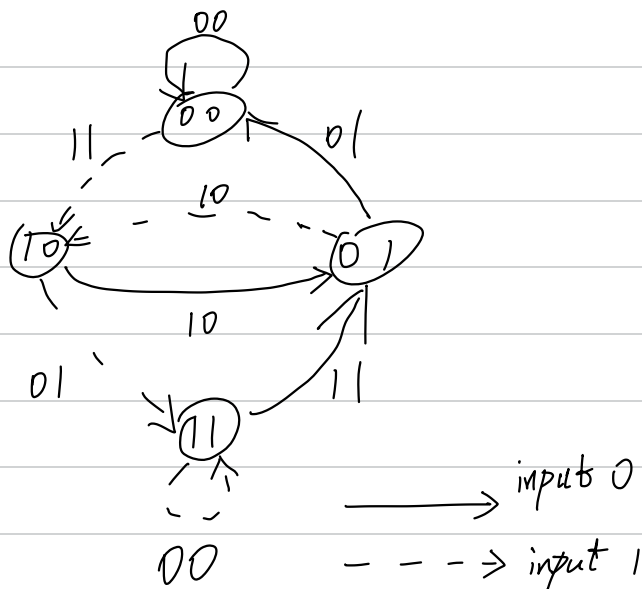


Figure 1

- (a) Draw the trellis diagram of the convolutional code.

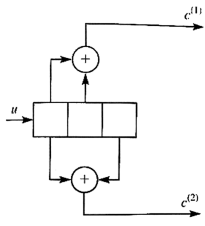


解题思路:

1. 先根据编码器的结构, 画出状态转移图
2. 根据状态转移图, 画出 Trellis Diagram.

Trellis Diagram 可理解为状态转移图引入了时间序

Trellis Diagram 的初始状态默认为 00



- (b) What is the encoded message if $u =$ (first bit) 10101011 (last bit)?
(assuming the registers of the encoder are of zero value at the initial stage)

input: 1 0 1 0 1 0 1 1 0 0
 encode: 11 10 10 10 10 10 01 11 01

状态
100

11

010

10

101

10

010

10

101

10

010

10

101

10

110

01

011

11

001

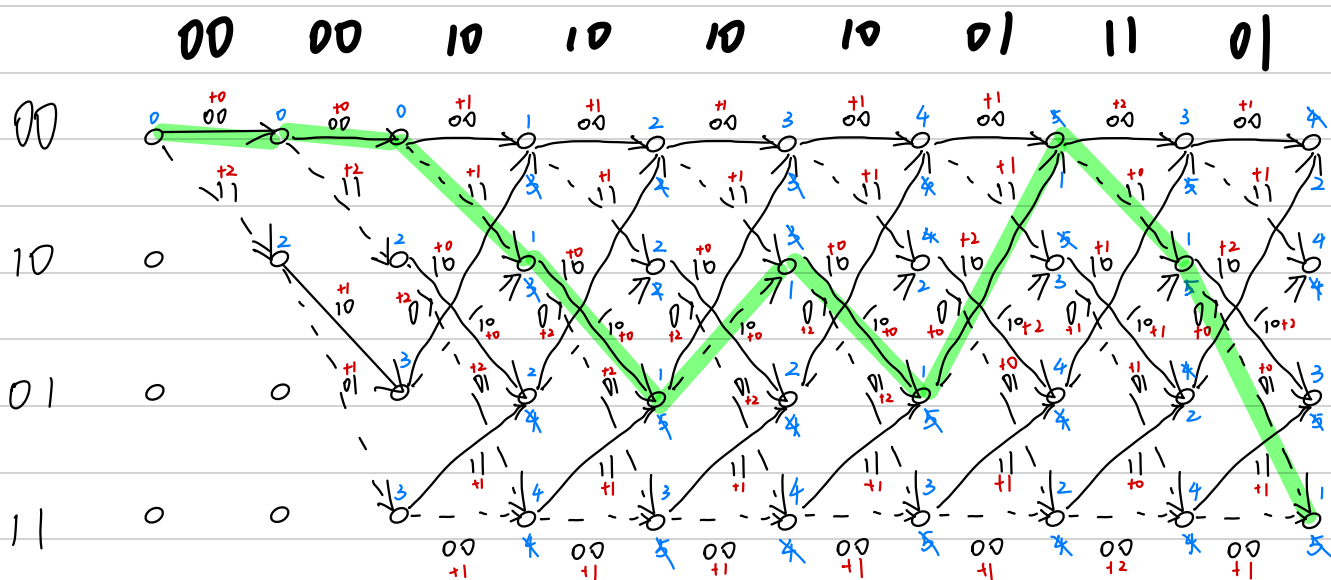
01

- (c) What is the decoded message if there are mistakes in the first three bits when you received the encoded message from (b)?

(8 Marks)

encoded: 11 10 10 10 10 10 01 11 01

decoded: 00 00 10 10 10 10 01 11 01



0 0 1 0 1 0 1 1 1

解码序列