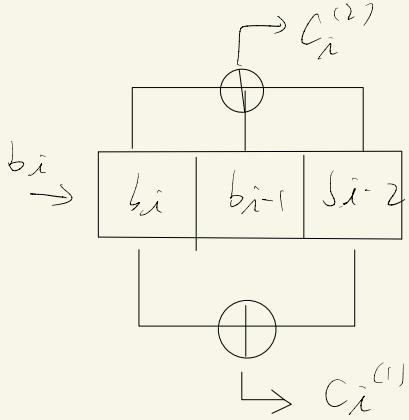
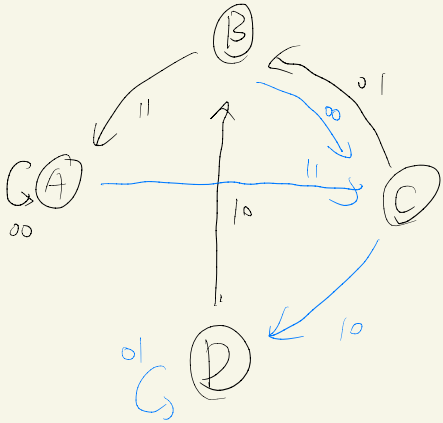
1. (a) $k=1$ $n=2$ $R=\frac{1}{2}$

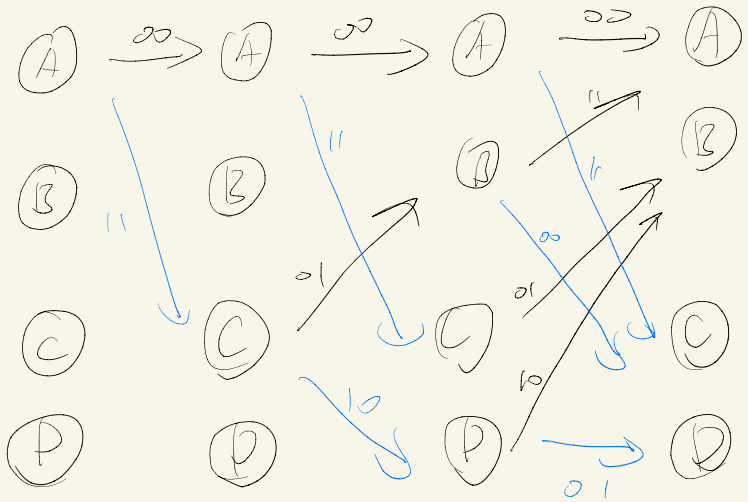
(b)



(c)

b_i	b_{i-1}	b_{i-2}	state	$c_i^{(1)}$	$c_i^{(2)}$	b_{i-1}	b_{i-2}	state
0	0	0	A	0	0	0	0	A
0	0	1	B	1	1	0	0	A
0	1	0	C	0	1	0	1	B
0	1	1	D	1	0	0	1	B
1	0	0	A	1	1	1	0	C
1	0	1	B	0	0	1	0	C
1	1	0	C	1	0	1	1	D
1	1	1	D	0	1	1	1	D



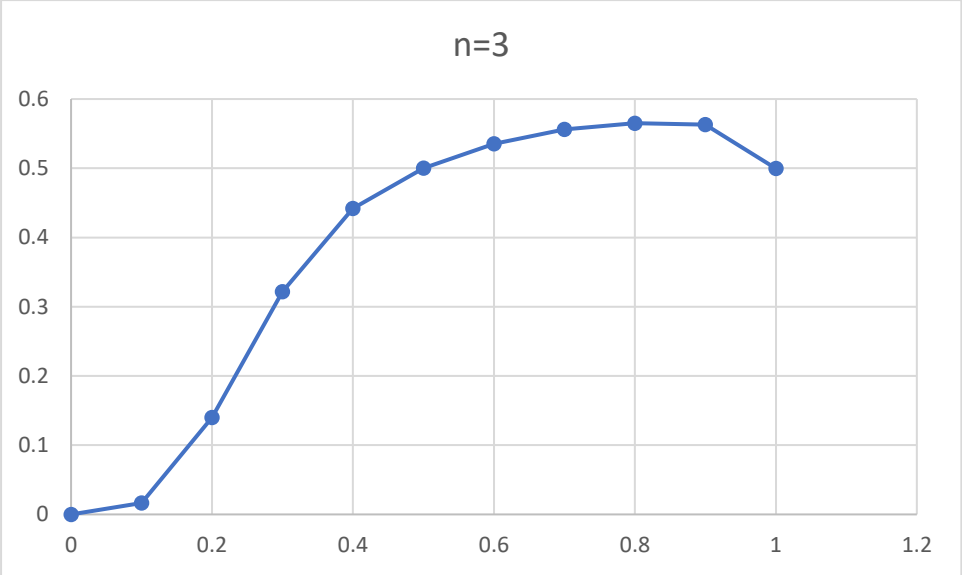


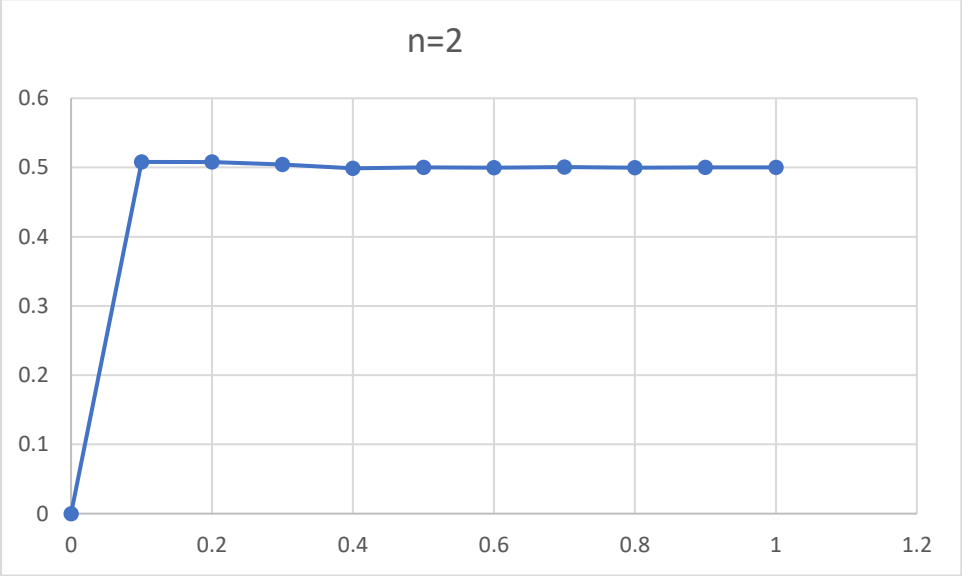
(e) $y = 00\ 11\ 01\ 00\ 01\ 01\ 00$

$\hat{c} = 00\ 11\ 01\ 00\ 01\ 11\ 00$

$\therefore b = 0\ 1\ 0\ 1\ 000$

(f) $d_H(y, \hat{c}) = 1$


n=3
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.2
0.4
0.6
0.8
1
1.2


n=2
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.2
0.4
0.6
0.8
1
1.2

0	0	0	a	0	0	a
0	0	1	b	0	1	a
0	1	0	c	1	0	b
0	1	1	d	1	1	b
1	0	0	a	1	1	c
1	0	1	b	1	0	c
1	1	0	c	0	1	d
1	1	1	d	0	0	d

以C為例，flip到第三個bit時

會改變路徑 ($a \to b$ or $b \to a$)

而每條路改變的幾率都 $= \frac{1}{2}$

因此 error rate 會 $= \frac{1}{2}$ ※