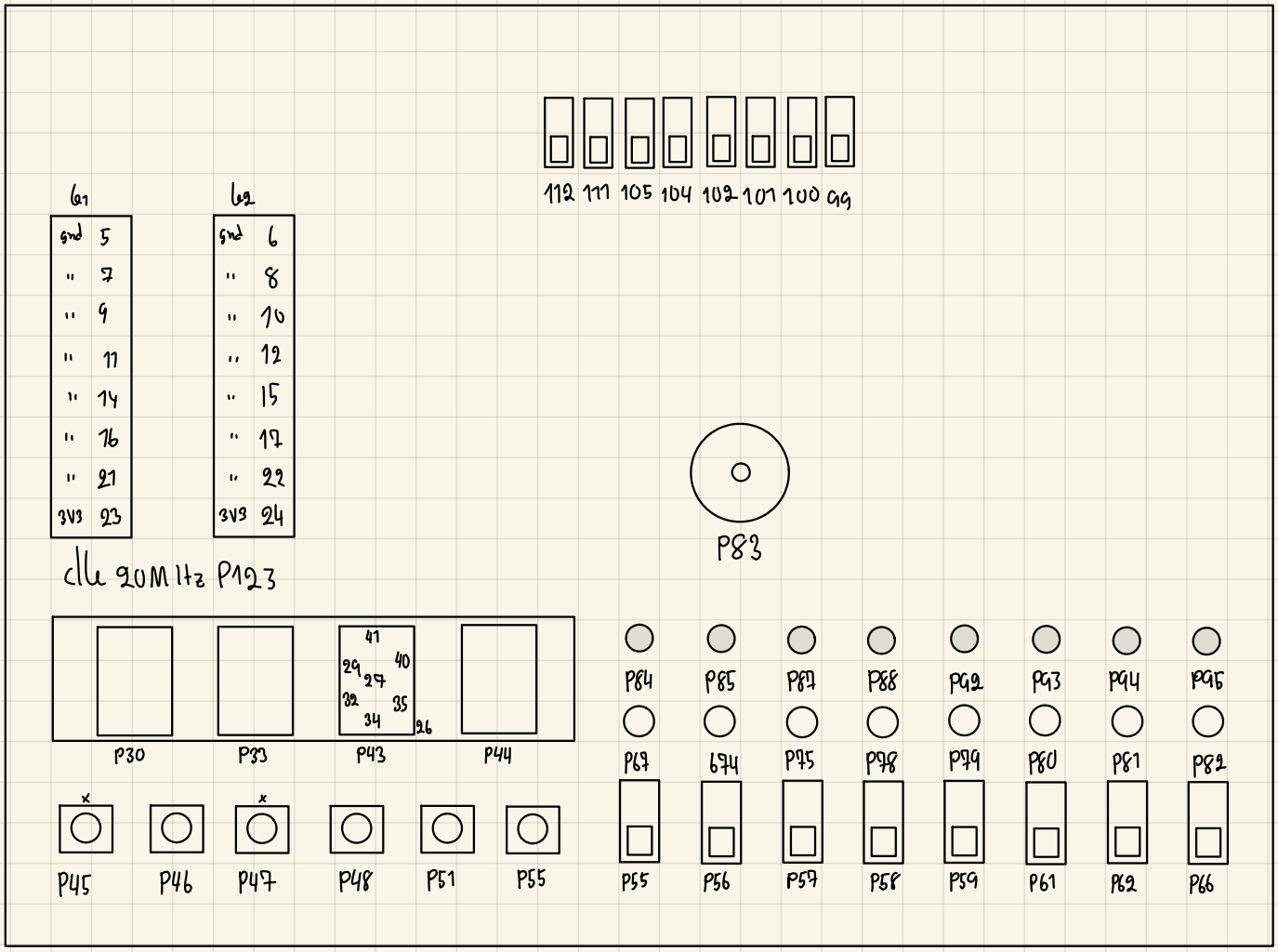

112 111 105 104 102 101 100 99
G1
GND 5
" 7
" 9
" 11
" 14
" 16
" 21
3V3 23
G2
GND 6
" 8
" 10
" 12
" 15
" 17
" 22
3V3 24
P83
clk 20MHz P123
41
40
29
27
32
35
34
36
P30
P33
P43
P44
P84
P85
P87
P88
P92
P93
P94
P95
P67
674
P75
P78
P79
P80
P81
P82
P45
P46
P47
P48
P51
P55
P55
P56
P57
P58
P59
P61
P62
P66

pdf

counter

BCD

	00	01	10	11
0				
1				

	00	01	10	11
0				
1				

	00	01	10	11
0				
1				

	00	01	10	11
0				
1				

	00	01	10	11
0				
1				

	00	01	10	11
0				
1				

	00	01	10	11
0				
1				

J_A

	00	01	11	10
00	0	0	0	0
01	0	0	1	0
11	X	X	X	X
10	X	X	X	X

K_A

	00	01	11	10
00	X	X	X	X
01	X	X	X	X
11	X	X	X	X
10	0	0	1	0

CD

J_B

	00	01	11	10
00	0	0	1	0
01	X	X	X	X
11	X	X	X	X
10	0	0	0	0

$\bar{A}CD$

K_B

	00	01	11	10
00	X	X	X	X
01	0	0	1	0
11	X	X	X	X
10	X	X	X	X

CD

J_C

	00	01	11	10
00	0	1	X	X
01	0	1	X	X
11	X	X	X	X
10	0	1	X	X

D

	00	01	10	11
0				
1				

	00	01	10	11
0				
1				

	00	01	10	11
0				
1				

	00	01	10	11
0				
1				

	00	01	10	11
0				
1				

	00	01	10	11
0				
1				

	00	01	10	11
0				
1				

t_C

	00	01	11	10
00	X	X	1	0
01	X	X	1	0
11	X	X	X	X
10	X	X	1	0

pdf

D

I_D

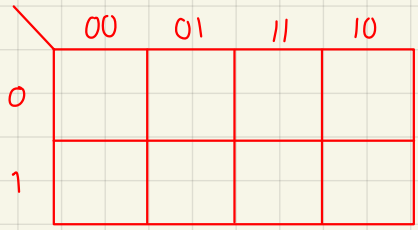
	00	01	11	10
00				
01				
11				
10				

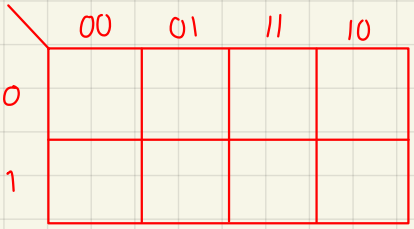
Q_D

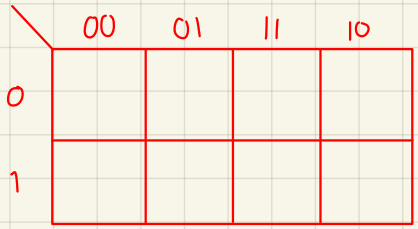
	00	01	11	10
00				
01				
11				
10				

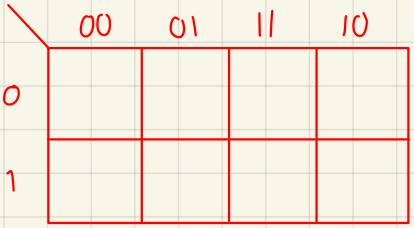
	00	01	11	10
00				
01				
11				
10				

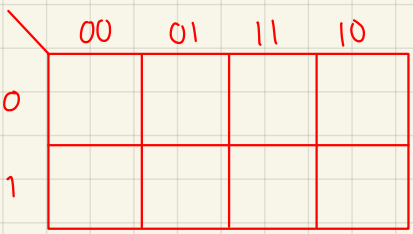
	00	01	11	10
00				
01				
11				
10				

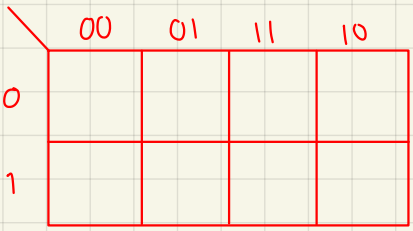

00 01 11 10
0
1

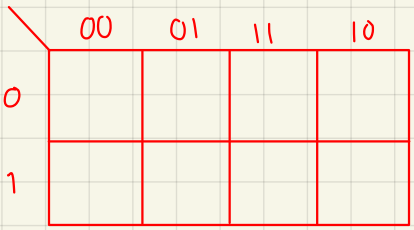

00 01 11 10
0
1

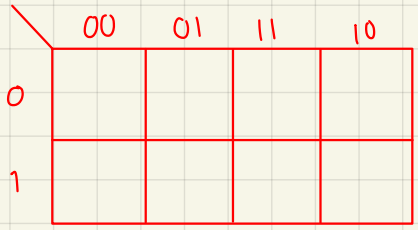

00 01 11 10
0
1

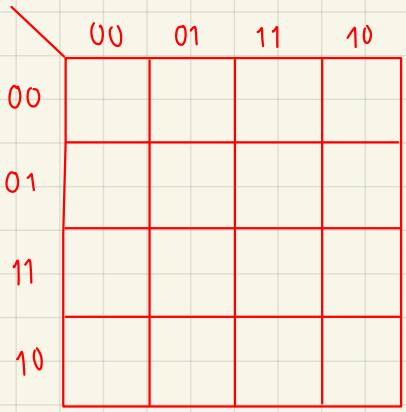

00 01 11 10
0
1


00 01 11 10
0
1

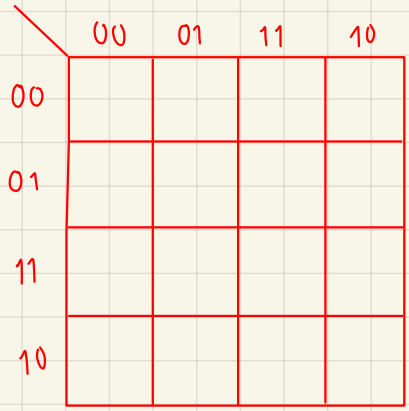

00 01 11 10
0
1

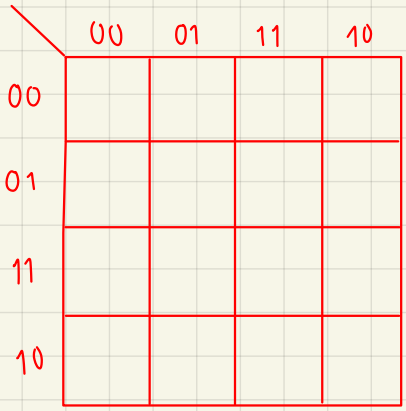

00 01 11 10
0
1

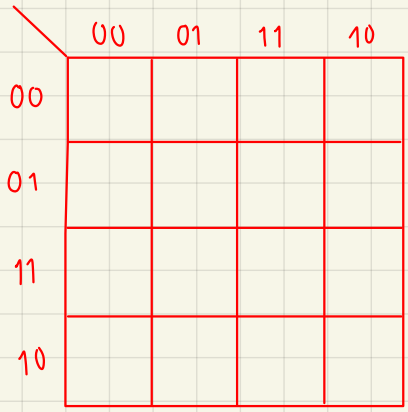

00 01 11 10
0
1

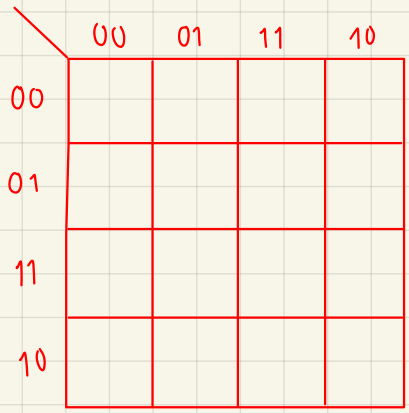

00 01 11 10
00
01
11
10

ตัวอย่าง


00 01 11 10
00
01
11
10


00 01 11 10
00
01
11
10


00 01 11 10
00
01
11
10


00 01 11 10
00
01
11
10

J_A

A \ BC	00	01	11	10
0	0	0	1	0
1	X	X	X	X

BC

K_A

A \ BC	00	01	11	10
0	X	X	X	X
1	0	1	X	X

C

J_B

A \ BC	00	01	11	10
0	0	1	X	X
1	0	0	X	X

$\bar{A}C$

K_B

A \ BC	00	01	11	10
0	X	X	1	0
1	X	X	X	X

C

J_C

	00	01	10	11
0				
1				

K_C

	00	01	10	11
0				
1				

V_{CC}

	00	01	10	11
0				
1				

	00	01	10	11
0				
1				

	00	01	11	10
00				
01				
11				
10				

contenos

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
00				
01				
11				
10				

J_A

A \ BC	00	01	11	10
0	0	0	1	0
1	X	X	X	X

$= BC$

G_A

A \ BC	00	01	11	10
0	X	X	X	X
1	0	0	X	1

$= B$

J_D

A \ BC	00	01	11	10
0	0	1	X	X
1	0	1	X	X

$= C$

G_B

A \ BC	00	01	11	10
0	X	X	1	0
1	X	X	X	1

$= C + A$

J_C

A \ BC	00	01	11	10
0	1	X	X	1
1	1	X	X	0

$= \bar{A} + \bar{B}$

A \ BC	00	01	11	10
0				
1				

	00	01	11	10
0				
1				

	00	01	11	10
0				
1				

	00	01	11	10
00				
01				
11				
10				

contenus

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
00				
01				
11				
10				

counter07

J_A

A \ BC	00	01	11	10
0	0	0	1	0
1	x	x	x	x

BC

Q_A

A \ BC	00	01	11	10
0	x	x	x	x
1	0	0	1	0

BC

J_B

A \ BC	00	01	11	10
0	0	1	x	x
1	0	1	x	x

C

Q_B

A \ BC	00	01	11	10
0	x	x	1	0
1	x	x	1	0

C

J_C

A \ BC	00	01	11	10
0				
1				

A \ BC	00	01	11	10
0				
1				

	00	01	11	10
0				
1				

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
00				
01				
11				
10				

J_A

A \ BC	00	01	11	10
0				
1				

K_A

A \ BC	00	01	11	10
0				
1				

J_B

A \ BC	00	01	11	10
0				
1				

K_B

A \ BC	00	01	11	10
0				
1				

J_C

A \ BC	00	01	11	10
0				
1				

K_C

A \ BC	00	01	11	10
0				
1				

J_D

	00	01	11	10
0				
1				

K_D

	00	01	11	10
0				
1				

contenos

BCD

J_A

	00	01	11	10
00	0	0	0	0
01	0	0	1	0
11	X	X	X	X
10	X	X	X	X

Q_A

	00	01	11	10
00	X	X	X	X
01	X	X	X	X
11	X	X	X	X
10	1	X	X	X

1

J_B

	00	01	11	10
00	0	0	1	0
01	X	X	X	X
11	X	X	X	X
10	0	X	X	X

CD

Q_B

	00	01	11	10
00	X	X	X	X
01	0	0	1	0
11	X	X	X	X
10	X	X	X	X

CD

J_C

	00	01	11	10
00	0	1	X	X
01	0	1	X	X
11	X	X	X	X
10	0	X	X	X

D

A \ BC	00	01	11	10
0				
1				

A \ BC	00	01	11	10
0				
1				

A \ BC	00	01	11	10
0				
1				

A \ BC	00	01	11	10
0				
1				

A \ BC	00	01	11	10
0				
1				

A \ BC	00	01	11	10
0				
1				

	00	01	11	10
0				
1				

	00	01	11	10
0				
1				

K_C

	00	01	11	10
00	X	X	1	0
01	X	X	1	0
11	X	X	X	X
10	X	X	X	X

D

J_D

	00	01	11	10
00	1	X	X	1
01	1	X	X	1
11	X	X	X	X
10	0	X	X	X

$\bar{A}$

Counter 0-10

J_A

	00	01	11	10
00	0	0	0	0
01	0	0	1	0
11	X	X	X	X
10	X	X	X	X

BCD

Q_A

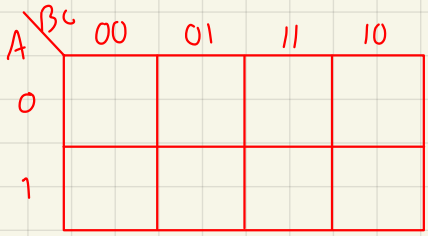
	00	01	11	10
00	X	X	X	X
01	X	X	X	X
11	X	X	X	X
10	0	0	X	1

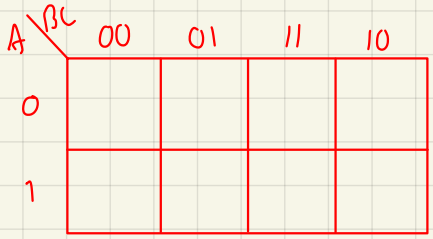
C

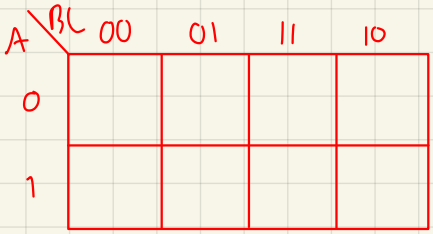
J_B

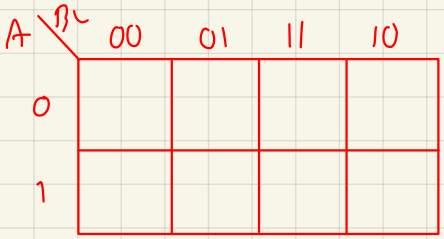
	00	01	11	10
00	0	0	1	0
01	X	X	X	X
11	X	X	X	X
10	0	0	X	0

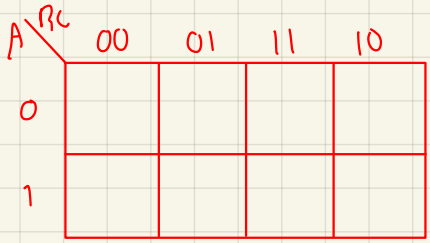
CD

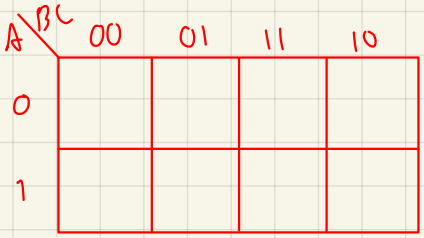

A
BC
00
01
11
10
0
1

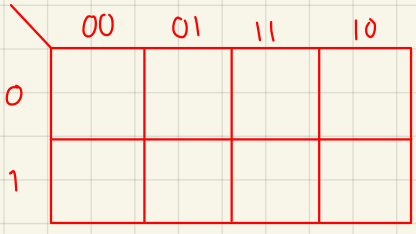

A
BC
00
01
11
10
0
1

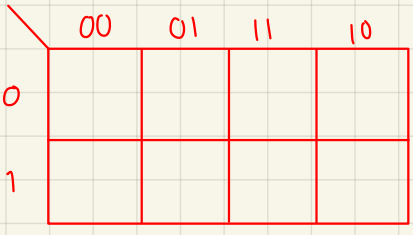

A
BC
00
01
11
10
0
1

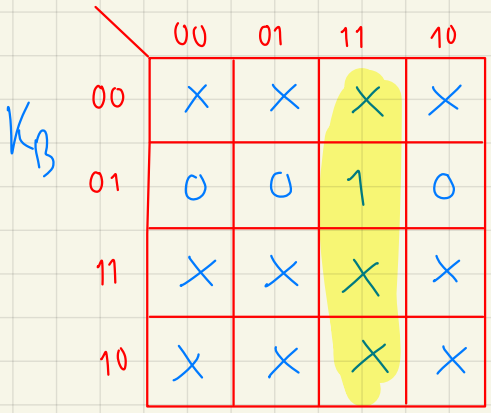

A
BC
00
01
11
10
0
1

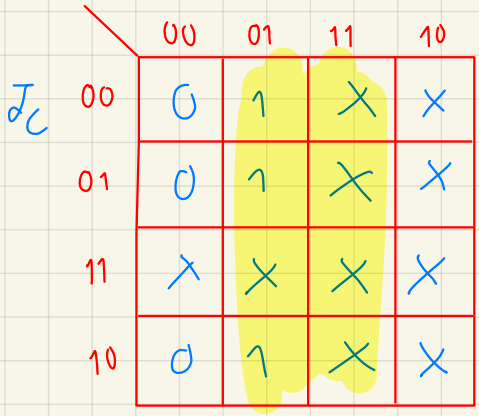

A
BC
00
01
11
10
0
1

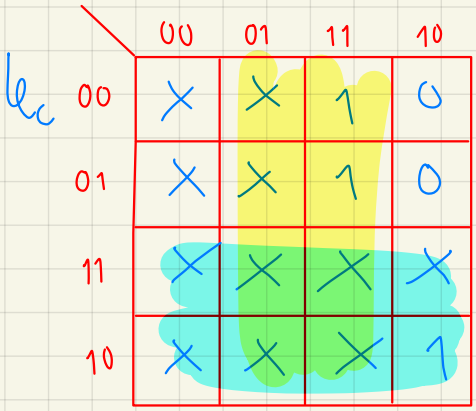

A
BC
00
01
11
10
0
1

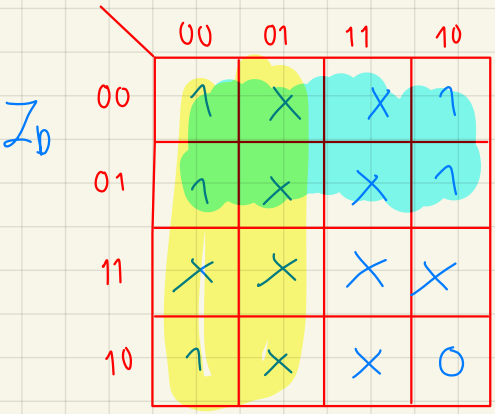

00
01
11
10
0
1

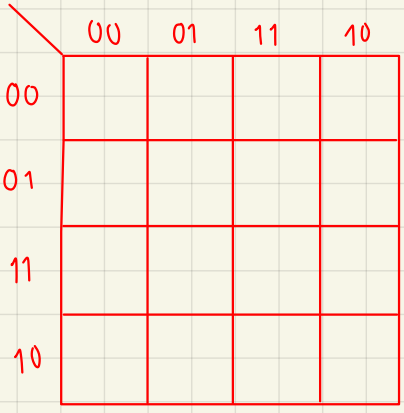

00
01
11
10
0
1


K_B
00
01
11
10
CD


J_C
00
01
11
10
D


k_C
00
01
11
10
D+A


J_D
00
01
11
10
$\bar{C} + \bar{A}$


00
01
11
10