數位系統設計實習
Lecture 9

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實習課助教：蔡沛希

Outline

- Introduce Dot Matrix

- LCDM

- LAB 9-1 、 9-2(bonus
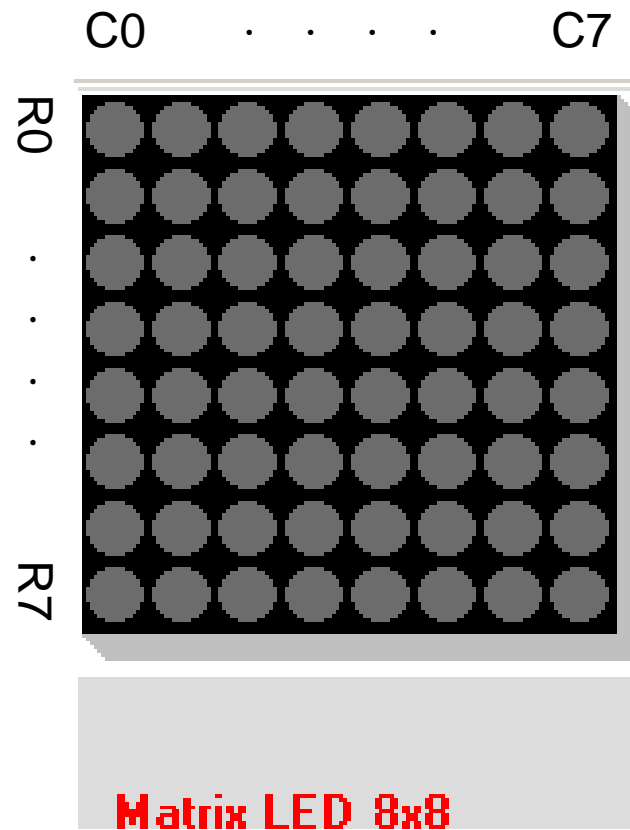
Chapter

- **Introduce Dot Matrix**

- LCDM

- LAB 9-1 、 9-2(bonus

Dot Matrix

Matrix LED 8x8

Dot Matrix

Ex:
Row = 8'b01000000,Column = 8'b00110000
Row = 8'b00000111,Column = 8'b10001001

由上往下依序輸出
row:
8'b00000001
8'b00000010
8'b00000100
8'b00001000
8'b00010000
8'b00100000
8'b01000000
8'b10000000

Chapter

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LCDM

LCDM

Pin NO	PIN Name	Function
1~8	DB0~DB7	Data Bits
9	RS	Register select 0: Select command register 1: Select data bits register
10	R/W	Read/Write 0: Write 1: Not function
11	EN	Enable signal 1→0:Data will be transfer at falling edge
12	RST	Reset signal 1: Clears entire display and returns the cursor to home position (left top).

LCDM
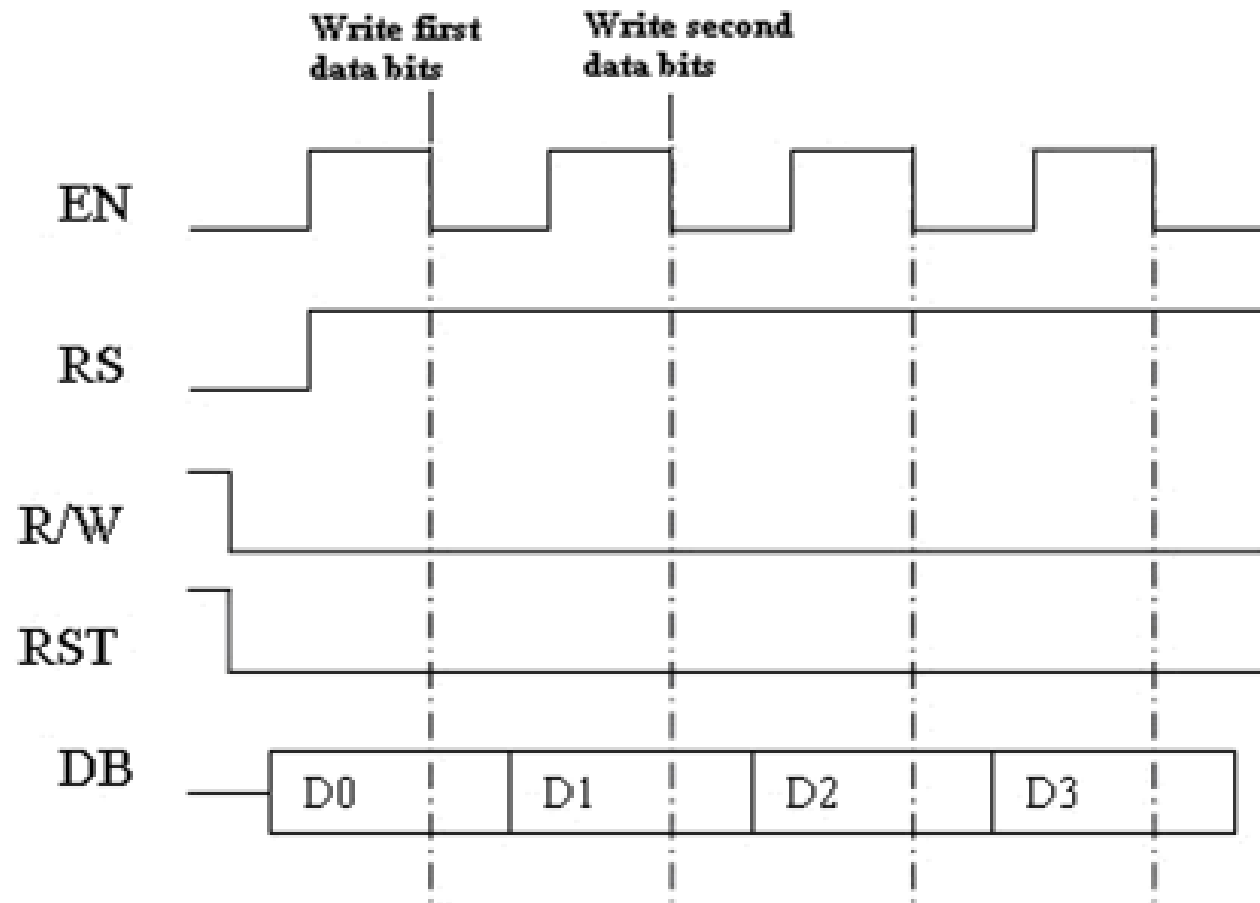
LCDM

Character pattern

code	pattern	code	pattern	code	pattern	code	pattern	code	pattern
0x00	space	0x01	!	0x02	"	0x03	#	0x04	$
0x05	%	0x06	&	0x07	'	0x08	(	0x09	)
0x0A	*	0x0B	+	0x0C	,	0x0D	-	0x0E	.
0x0F	/	0x10	0	0x11	1	0x12	2	0x13	3
0x14	4	0x15	5	0x16	6	0x17	7	0x18	8
0x19	9	0x1A	:	0x1B	;	0x1C	<	0x1D	=
0x1E	>	0x1F	?	0x20	@	0x21	A	0x22	B
0x23	C	0x24	D	0x25	E	0x26	F	0x27	G
0x28	H	0x29	I	0x2A	J	0x2B	K	0x2C	L
0x2D	M	0x2E	N	0x2F	O	0x30	P	0x31	Q
0x32	R	0x33	S	0x34	T	0x35	U	0x36	V
0x37	W	0x38	X	0x39	Y	0x3A	Z	0x3B	[
0x3C	\	0x3D	]	0x3E	^	0x3F	_	0x40	`
0x41	a	0x42	b	0x43	c	0x44	d	0x45	e
0x46	f	0x47	g	0x48	h	0x49	i	0x4A	j
0x4B	k	0x4C	l	0x4D	m	0x4E	n	0x4F	o
0x50	p	0x51	q	0x52	r	0x53	s	0x54	t
0x55	u	0x56	v	0x57	w	0x58	x	0x59	y
0x5A	z	0x5B	{	0x5C			0x5D	}	0x5E	~
0x5F	0x5F ~ 0xFF space character								

LAB：LCDM controler

1. 按下reset（key0）鍵後，LCDM顯示如下圖

N	T	U	S	T		E	E								
F	P	G	A		C	O	U	R	S	E					

2. 按下換頁（key1）鍵，LCDM顯示學號，如下圖

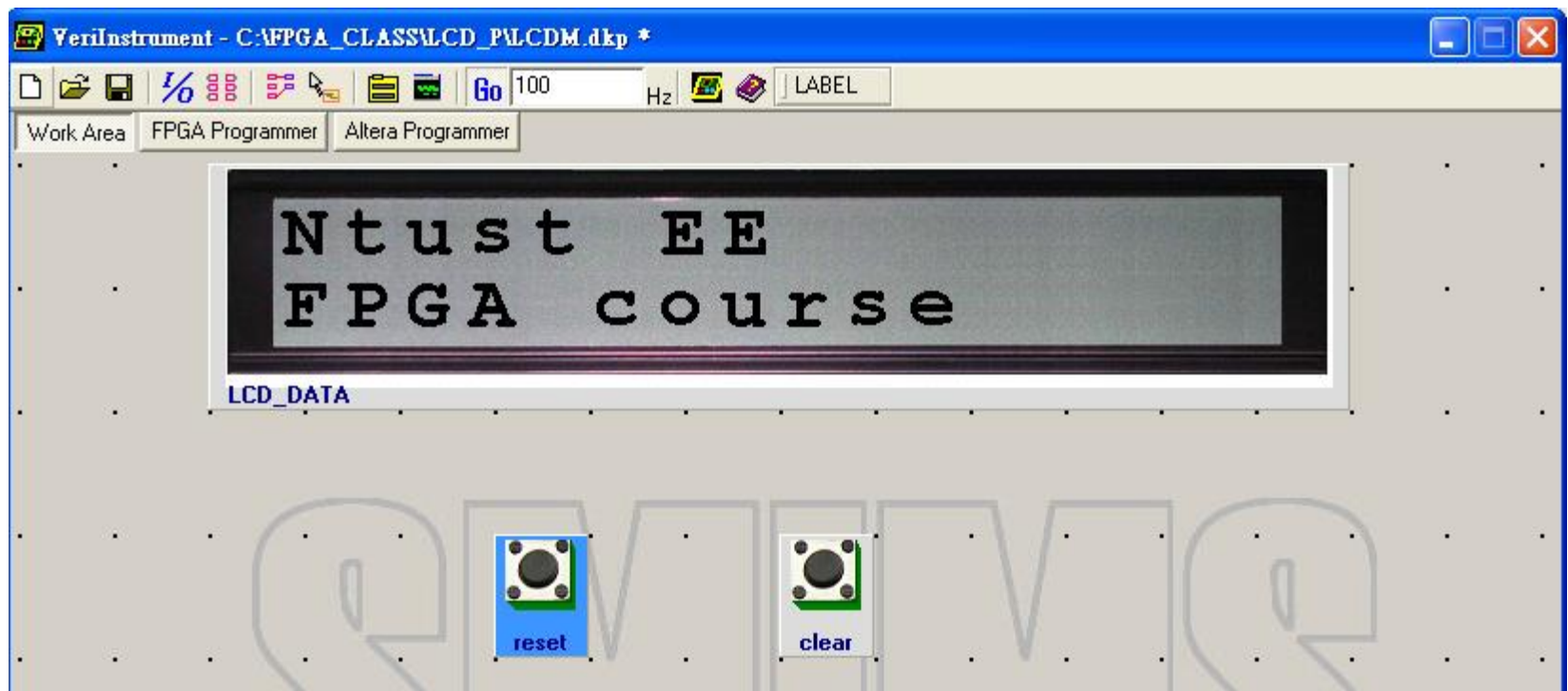| M	1	0	3	0	7	4	1	6							

Chapter

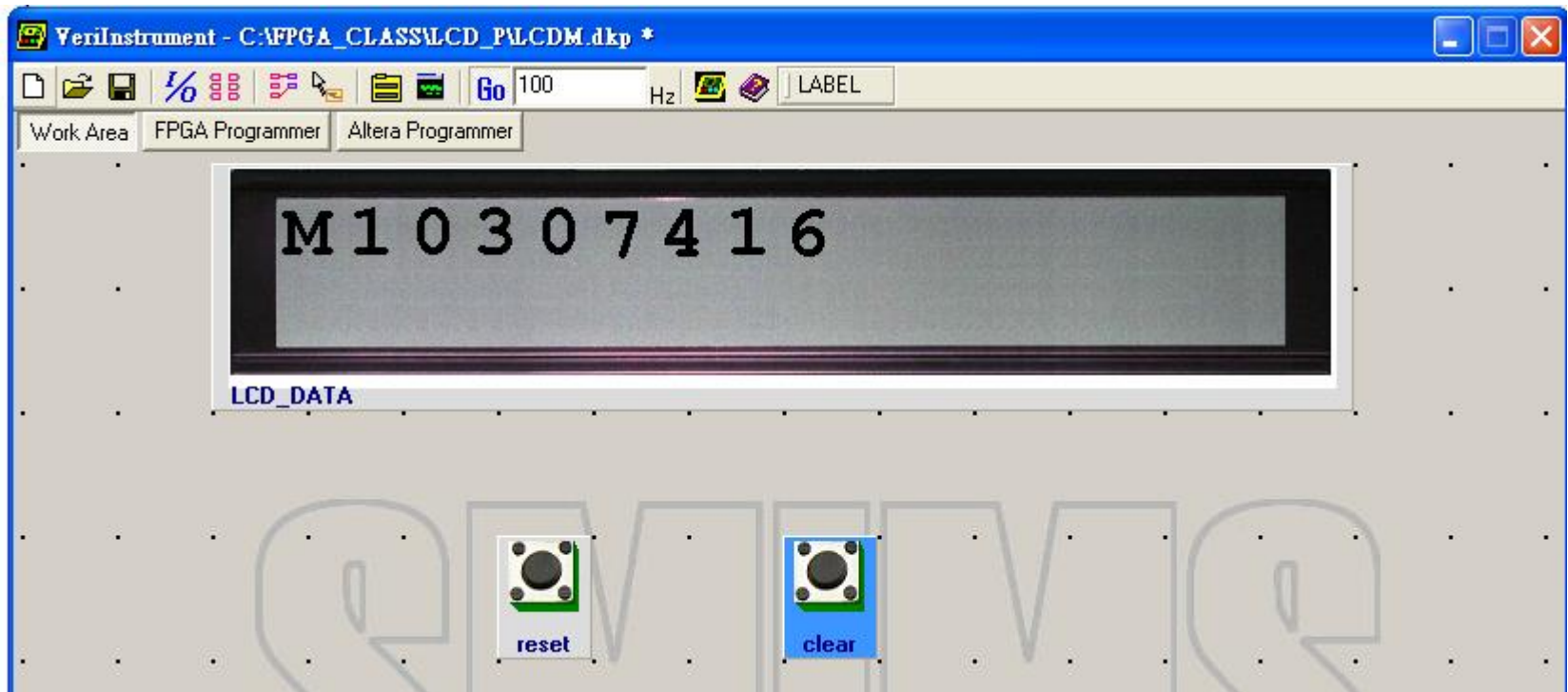- Introduce Dot Matrix

- LCDM

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LAB 9-1
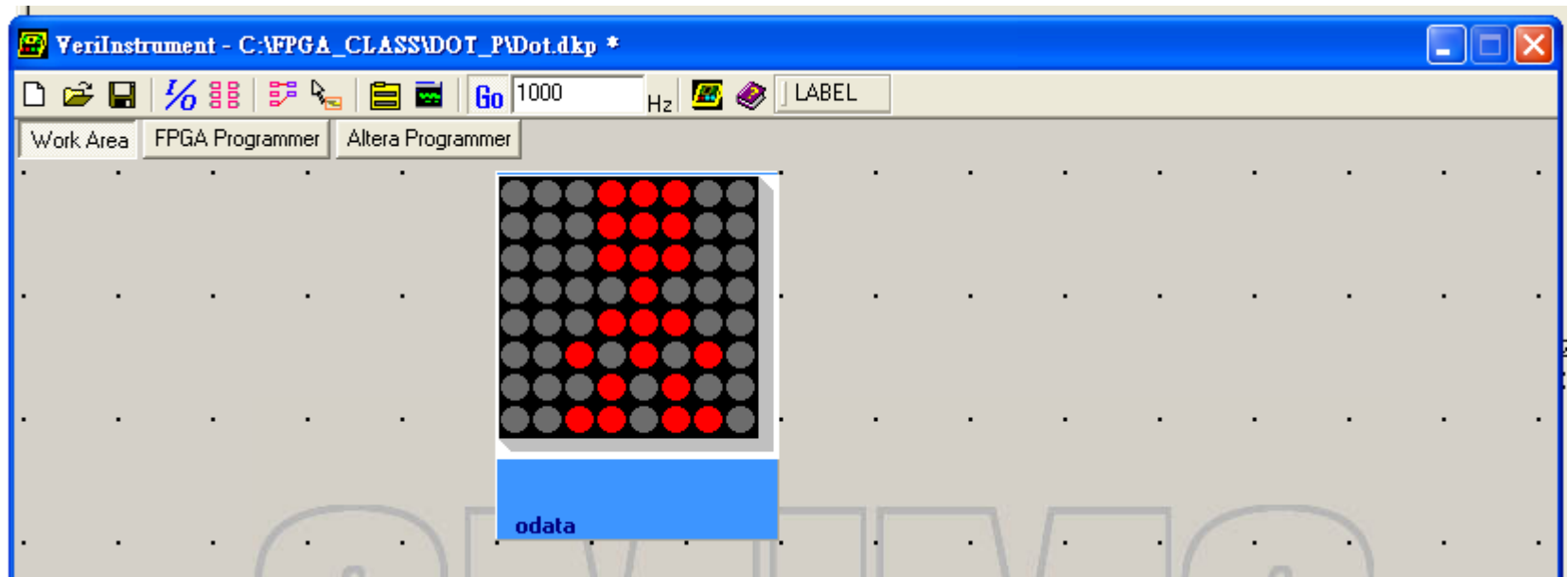
LAB 9-2：LCDM controler

LAB 9-2：LCDM controler

LAB 9

下課前繳交至moodle：

上傳verilog.v

波形截圖