Lab 9: Keyboard (Calculator)

Objective

✓   Implement keyboard function.

Prerequisite

✓   Fundamentals of logic gates.
✓   Logic modeling in Verilog HDL.
✓   Keyboard control procedure

Experiments

按下去數字會一直顯示

1   Implement Key Board
  1.1   Press 0/1/2/3/4/5/6/7/8/9 and show them in the seven-segment display. When a new number is pressed, the previous number is refreshed and over written.
  1.2   Press a/s/m (addition/subtraction/multiplication) and show them in the seven-segment display as your own defined A/S/M pattern. When you press "Enter", refresh (turn off) the seven-segment display.

2   Implement a single digit decimal adder using the keyboard as the input and display the results on the 14-segment display (The first two digit are the addend/augend, and the last two digits are the sum).

3   Implement a two-digit decimal adder/subtractor/multiplier using the right-hand-side keyboard (inside the red block). You don't need to show all inputs and outputs at the same time in the 7-segment display. You just need to show inputs when they are pressed and show the results after "Enter" is pressed.
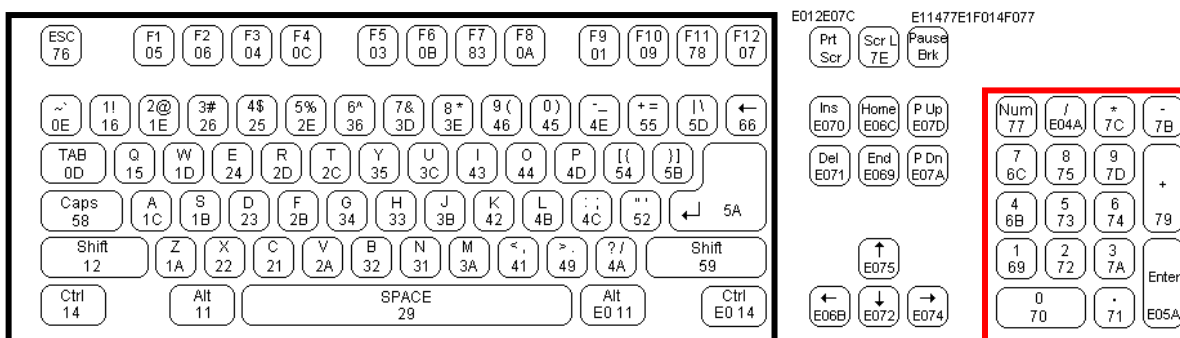
4   Implement the "Caps" control in the keyboard. When you press A-Z and a-z in the keyboard, the ASCII code of the pressed key (letter) is shown on 7-bit LEDs.
  4.1   Press "Caps Lock" key to change the status of capital/lower case on the keyboard. Use a led to indicate the status of capital/lowercase in the keyboard and show the ASSCII code of the pressed key one 7-bit LEDS.
  4.2   Implement the combinational keys. When you press "Shift" and the letter keys at the

same time. The 7-bit LEDs will show the ASCII code of the uppercase/lowercase of the pressed letter when the "Caps Lock" is at the lowercase/uppercase status.

Dec	Hx	Oct	Char			Dec	Hx	Oct	Html	Chr		Dec	Hx	Oct	Html	Chr		Dec	Hx	Oct	Html	Chr
0	0	000	NUL	(null)		32	20	040	 	Space		64	40	100	@	@		96	60	140	`	`
1	1	001	SOH	(start of heading)		33	21	041	!	!		65	41	101	A	A		97	61	141	a	a
2	2	002	STX	(start of text)		34	22	042	"	"		66	42	102	B	B		98	62	142	b	b
3	3	003	ETX	(end of text)		35	23	043	#	#		67	43	103	C	C		99	63	143	c	c
4	4	004	EOT	(end of transmission)		36	24	044	$	$		68	44	104	D	D		100	64	144	d	d
5	5	005	ENQ	(enquiry)		37	25	045	%	%		69	45	105	E	E		101	65	145	e	e
6	6	006	ACK	(acknowledge)		38	26	046	&	&		70	46	106	F	F		102	66	146	f	f
7	7	007	BEL	(bell)		39	27	047	'	'		71	47	107	G	G		103	67	147	g	g
8	8	010	BS	(backspace)		40	28	050	(	(		72	48	110	H	H		104	68	150	h	h
9	9	011	TAB	(horizontal tab)		41	29	051	)	)		73	49	111	I	I		105	69	151	i	i
10	A	012	LF	(NL line feed, new line)		42	2A	052	*	*		74	4A	112	J	J		106	6A	152	j	j
11	B	013	VT	(vertical tab)		43	2B	053	+	+		75	4B	113	K	K		107	6B	153	k	k
12	C	014	FF	(NP form feed, new page)		44	2C	054	,	,		76	4C	114	L	L		108	6C	154	l	l
13	D	015	CR	(carriage return)		45	2D	055	-	-		77	4D	115	M	M		109	6D	155	m	m
14	E	016	SO	(shift out)		46	2E	056	.	.		78	4E	116	N	N		110	6E	156	n	n
15	F	017	SI	(shift in)		47	2F	057	/	/		79	4F	117	O	O		111	6F	157	o	o
16	10	020	DLE	(data link escape)		48	30	060	0	0		80	50	120	P	P		112	70	160	p	p
17	11	021	DC1	(device control 1)		49	31	061	1	1		81	51	121	Q	Q		113	71	161	q	q
18	12	022	DC2	(device control 2)		50	32	062	2	2		82	52	122	R	R		114	72	162	r	r
19	13	023	DC3	(device control 3)		51	33	063	3	3		83	53	123	S	S		115	73	163	s	s
20	14	024	DC4	(device control 4)		52	34	064	4	4		84	54	124	T	T		116	74	164	t	t
21	15	025	NAK	(negative acknowledge)		53	35	065	5	5		85	55	125	U	U		117	75	165	u	u
22	16	026	SYN	(synchronous idle)		54	36	066	6	6		86	56	126	V	V		118	76	166	v	v
23	17	027	ETB	(end of trans. block)		55	37	067	7	7		87	57	127	W	W		119	77	167	w	w
24	18	030	CAN	(cancel)		56	38	070	8	8		88	58	130	X	X		120	78	170	x	x
25	19	031	EM	(end of medium)		57	39	071	9	9		89	59	131	Y	Y		121	79	171	y	y
26	1A	032	SUB	(substitute)		58	3A	072	:	:		90	5A	132	Z	Z		122	7A	172	z	z
27	1B	033	ESC	(escape)		59	3B	073	;	;		91	5B	133	[	[		123	7B	173	{	{
28	1C	034	FS	(file separator)		60	3C	074	<	<		92	5C	134	\	\		124	7C	174	|		
29	1D	035	GS	(group separator)		61	3D	075	=	=		93	5D	135	]	]		125	7D	175	}	}
30	1E	036	RS	(record separator)		62	3E	076	>	>		94	5E	136	^	^		126	7E	176	~	~
31	1F	037	US	(unit separator)		63	3F	077	?	?		95	5F	137	_	_		127	7F	177	&#127;	DEL

Source: www.LookupTables.com