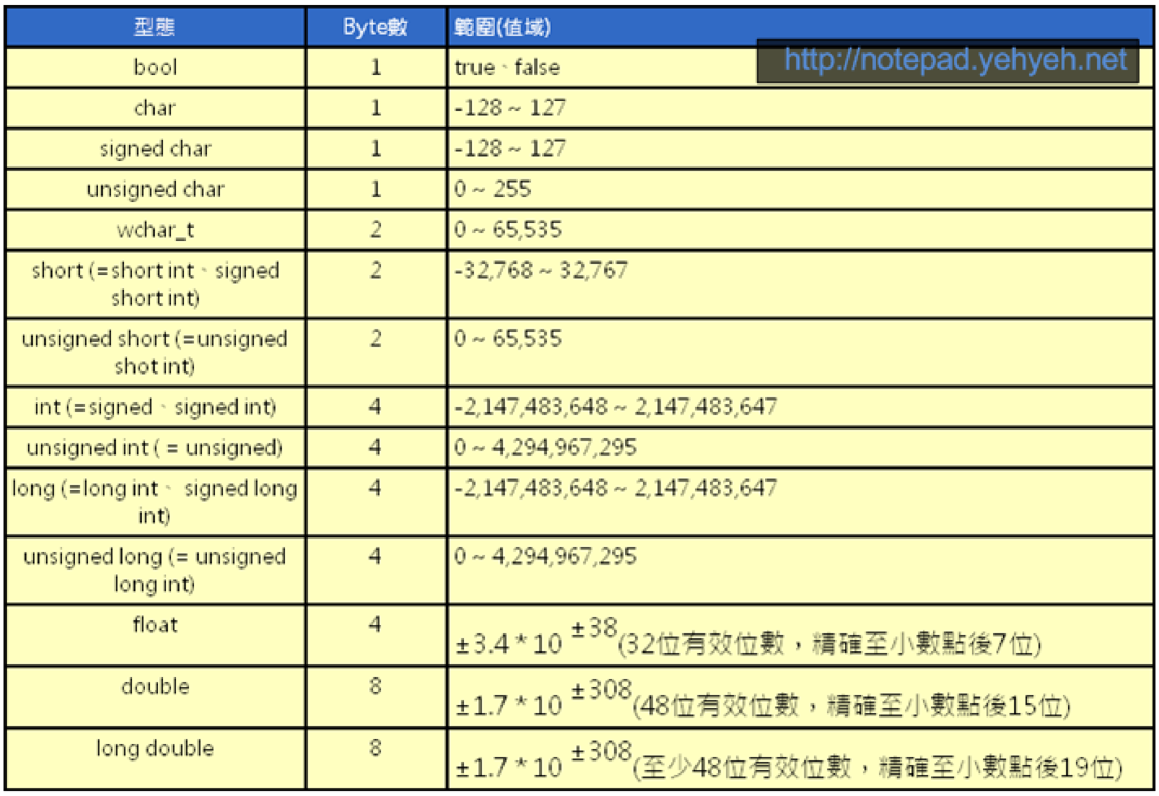
CH1 Fundamentals

1. scanf(“%1d”, num); 一次只讀一個數字

CH2 Control Structures

continue: 直接到迴圈最下面
goto: 後面接標籤(類似 case)

CH3 DataTypes



型態	Byte數	範圍(值域)
bool	1	true、false
char	1	-128 ~ 127
signed char	1	-128 ~ 127
unsigned char	1	0 ~ 255
wchar_t	2	0 ~ 65,535
short (=short int、signed short int)	2	-32,768 ~ 32,767
unsigned short (=unsigned shot int)	2	0 ~ 65,535
int (=signed、signed int)	4	-2,147,483,648 ~ 2,147,483,647
unsigned int (= unsigned)	4	0 ~ 4,294,967,295
long (=long int、signed long int)	4	-2,147,483,648 ~ 2,147,483,647
unsigned long (= unsigned long int)	4	0 ~ 4,294,967,295
float	4	$\pm 3.4 * 10^{\pm 38}$(32位有效位數，精確至小數點後7位)
double	8	$\pm 1.7 * 10^{\pm 308}$(48位有效位數，精確至小數點後15位)
long double	8	$\pm 1.7 * 10^{\pm 308}$(至少48位有效位數，精確至小數點後19位)

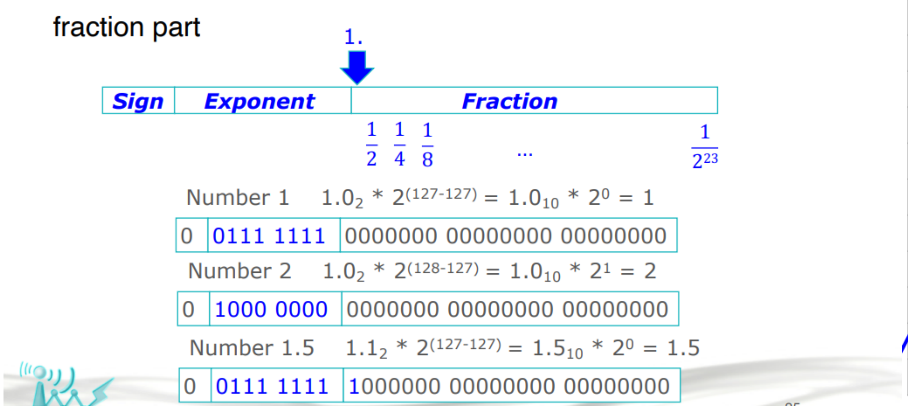
Integer

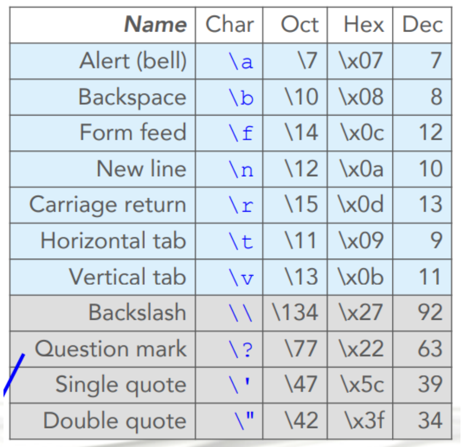
1. 強制指定成某 datatype，在尾巴加東西
ex. 15L, 0x7fffffffULL, 0.53f(浮點數默認是雙精度)

2. Reading and Writing
%d, %lld(long long), %hd(short int), %f or %e or %g(float and double), 但 scanf 時%lf or %le or %lg(double 要加 l)
for unsigned int: %u(unsigned decimal), %o(unsigned oct), %x(unsigned hex)

Floating Num

3. IEEE754 floating-point standard
sign(1 bit), exponent(8bits), fraction(23bits)





Name	Char	Oct	Hex	Dec
Alert (bell)	\a	\7	\x07	7
Backspace	\b	\10	\x08	8
Form feed	\f	\14	\x0c	12
New line	\n	\12	\x0a	10
Carriage return	\r	\15	\x0d	13
Horizontal tab	\t	\11	\x09	9
Vertical tab	\v	\13	\x0b	11
Backslash	\\	\134	\x27	92
Question mark	\?	\77	\x22	63
Single quote	\'	\47	\x5c	39
Double quote	\"	\42	\x3f	34

Char

4. ASCII、跳脫字元

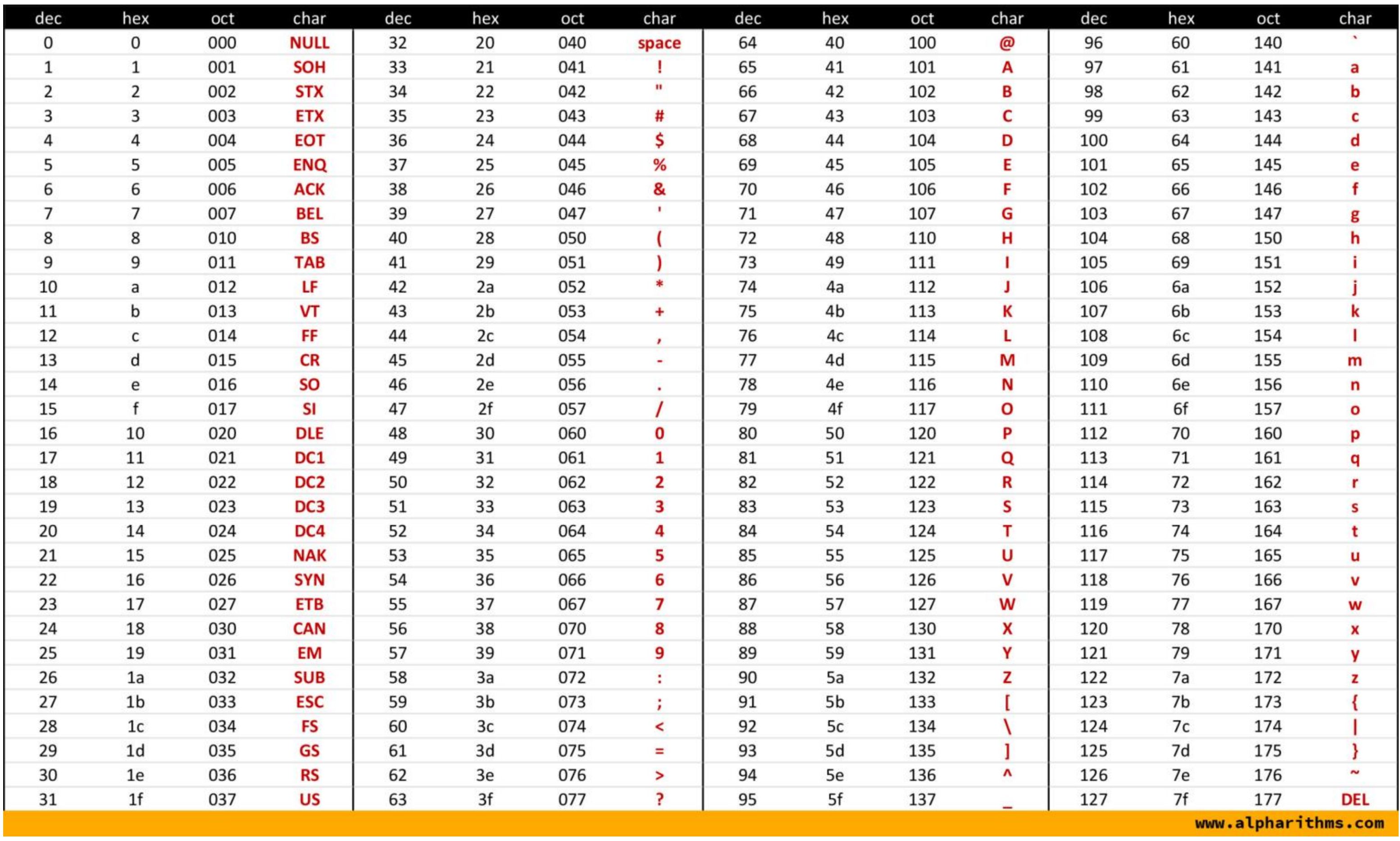
(10)\n, (32)space,

(37)%, (42)*, (43)+, (45)-, (47)/,

(48~57)0~9,

(65~90)A~Z,

(97~122)a~z



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

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5. <ctype.h> 的 toupper()

6. 讀取字元(scanf, getchar 不會跳過空白)

(1)scanf(“ %c“, &ch); 前面加空白，可跳過

型別轉換

1. int 轉 float(1bit + 23 fraction bits)可能會有精度失誤(當 int 的使用的 bit 大於 float 限制)

2. casting(強制轉換) 是一種 unary operator

Bitwise Operation

1. operators: &, |, ~(not), <<, >>, ^(xor)

2. Setting a bit by or

i = 0x000 = 000000000000

j = 0x010 = 000000010000

i | j =   000000010000

3. Clearing a bit by 目標處 and 0

i = 0x1111

j = 0x0010(想要把第二個 16 位元-bit 都換成 0)

i & (~j) = 0x1101

4. Testing a bit
I & (1 << j) testing bit j

CH5 Array

1. int a[15] = {[14] = 48, [9] = 7, [2] = 29};
2. array length = sizeof(array) / sizeof(a[0])

CH6 Function and Scope

1. void 也可以 return
2. %p 印指標

注意事項:
1. 運算中有沒有可能溢位(特別是變數範圍給得很接近 limit)
ASCII code 也會(%26 處理)
2. 注意不必要的符號、空格、換行被讀入
多利用 scanf(“%d%c%d”, &a, &useless, &b); or scanf(“%d\n”)