

**OX** **BARE**  
**CB** **METAL**

**So far, we've lived  
in a world without  
much structure...**

What? And why?

# Reconsider...

A previous program

1 901

2 705

3 640

4 801

5 551

6 902

7 000

40 350

41 551

42 150

43 351

44 598

45 199


46 347

51 000

98 600

ASCII (1977/1986)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0x	NUL	SOM	STX	ETX	EOT	ENQ	ACK	BEL	BS	HT	LF	VT	FF	CR	SO	SI
1x	DLE	DC1	DC2	DC3	DC4	NAK	SYN	ETB	CAN	EM	SUB	ESC	FS	GS	RS	US
2x	SP	!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/
3x	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4x	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5x	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6x	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7x	p	q	r	s	t	u	v	w	x	y	z	{		}	~	DEL

 Changed or added in 1963 version  
 Changed in both 1963 version and 1965 draft

A = 10  
 B = 11  
 C = 12  
 D = 13  
 E = 14  
 F = 15

**Write a  
program to  
translate the  
following...**

This is your program's  
input:

04×8

04×5

04×C

04×C

04×F

01×F

04×C

05×0

04×3

02×1

00×0

00×0

# We have to make choices.

How do we represent...

?



04xC

# What do we need?

Some subroutines...

- Decide how to decode input
- Decide how to translate the input to integer form
- Decide how to store and retrieve later numbers/letters.

# Multiply to 10

This...DOES IT!

01 901

02 330

03 526

04 130

05 326

06 527

07 100

08 327

09 225

10 703

11 615

15 526

16 902

17 000

25 009

26 000

27 000



# Clock cycles

Complexity per  
instruction in our LPC  
ISA

1XX	3
2XX	3
3XX	1
4LR	1 PER SHIFT
5XX	2
6XX	2
7XX	2
8XX	2
901	1
902	2
000	0