ASCII Codes

We use numbers, letters and special symbols when we use the computer. However, the computer can only deal with numbers - binary (Base 2) numbers to be exact. Therefore all the characters on the keyboard are coded by the computer as a series of eight 0's and 1's. For example, when a user types the letter “A”, the computer recognizes it as 01000001. This binary (Base 2) number can be converted to a decimal (Base 10) number with which we are more familiar. The letter “A” can be thought of as being seen by the computer as 65.

Back in the early days of computer formatting, a group of computer scientist determined what binary number each character should have. This code, called the **ASCII** (American Standard Computer Information Interchange) **Code**, is used by every computer using the English language (and many “western” languages). Why is it important that all computers follow ASCII Code?

Common ASCII Codes

Decimal Value	ASCII Value	Decimal Value	ASCII Value	Decimal Value	ASCII Value	Decimal Value	ASCII Value
32	space	56	8	80	P	104	h
33	!	57	9	81	Q	105	i
34	"	58	:	82	R	106	j
35	#	59	;	83	S	107	k
36	$	60	<	84	T	108	l
37	%	61	=	85	U	109	m
38	&	62	>	86	V	110	n
39	'	63	?	87	W	111	o
40	(	64	@	88	X	112	p
41	)	65	A	89	Y	113	q
42	*	66	B	90	Z	114	r
43	+	67	C	91	[	115	s
44	,	68	D	92	\	116	t
45	-	69	E	93	]	117	u
46	.	70	F	94	^	118	v
47	/	71	G	95	_	119	w
48	0	72	H	96	`	120	x
49	1	73	I	97	a	121	y
50	2	74	J	98	b	122	z
51	3	75	K	99	c	123	{
52	4	76	L	100	d	124	|
53	5	77	M	101	e	125	}
54	6	78	N	102	f	126	~
55	7	79	O	103	g		

Assignment

Answer the following questions about ASCII. You may have to use the Internet in your research.

1. A standard ASCII chart has an ‘a’ stored as 97 in Base 10. What is ‘a’ stored as in binary?

2. What would is B stored as in binary and in Base 10?

3. What is the ASCII value of:
   - Z
   - z
   - @
   - a space
   - pressing the Backspace key; (Hint: Use the short form)
   - pressing the Enter key. (Hint: Pressing the Enter key starts a new line)

4. Computers use the ASCII code when comparing words. For each of the cases below, state which word is "less than" (ie. comes before) the other. Explain your reasoning.

a)		b)		c)		d)	
hello	there	Hello	There	hello	Hello	Peterson	Peter

5. a) How many ASCII values are there?

   b) What is the first value and the last value in the ASCII code?

6. What is the ASCII Extended Character Set? What is it used for?

7. a) What is **Unicode**? Why is Unicode more useful than ASCII?

   b) What are the following values in Unicode: a, A, Z, z, space and pressing the Enter key?