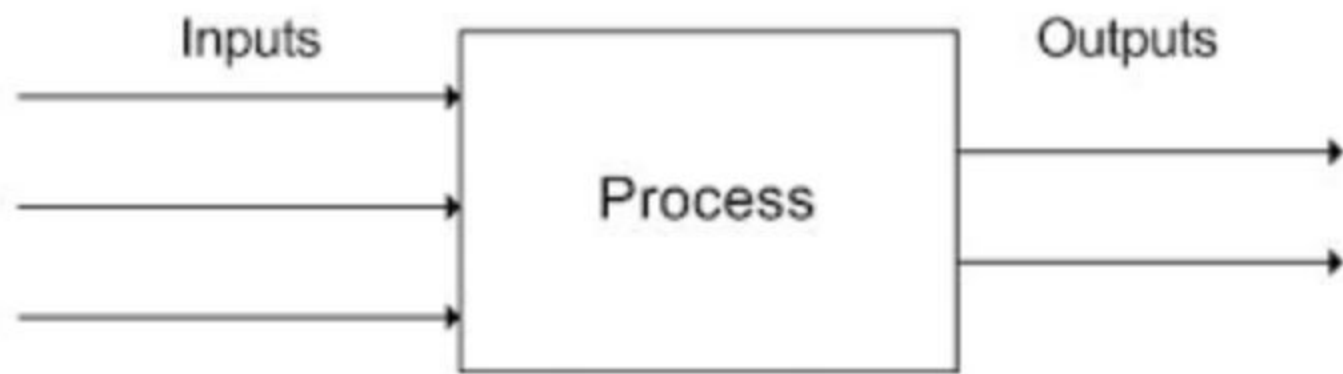


# Lecture 1

# Today's Objective

- 1) How to talk to a computer?
- 2) What language does a computer understand?
- 3) How does a computer store information



- Computer use millions of electronic circuits and switches which can either be **On** or **Off**



- **On** is represented by **1** and **Off** is represented by **0**

Decimal Number:

$$998 = 900 (10^2) + 90 (10^1) + 8 (10^0)$$

$$1995 = 1000 + 900 + 90 + 5$$

0 - 9 ->

Binary Number :

$$01101000 = ?$$

$$01101000 = 0 (2^7 = 128) + 1 (2^6 = 64) + 1 (2^5 = 32) + 0 (2^4 = 16) + 1 (2^3 = 8) + 0 (2^2 = 4) + 0 (2^1 = 2) + 0 (2^0 = 1)$$

Bit position	1	2	3	4	5	6	7	8
Bit	1	1	1	1	1	1	1	1
Binary-to-decimal calculation (exponent)	$2^0$	$2^1$	$2^2$	$2^3$	$2^4$	$2^5$	$2^6$	$2^7$
Decimal value	1	2	4	8	16	32	64	128

$$01101000 = 8 + 32 + 64 = 104$$

$$0 + 64 + 32 + 0 + 8 + 0 + 0 + 0 = 104$$

$$11111111 = 1 + 2 + 4 + 8 + 16 + 32 + 64 + 128 = 255$$

$$1111100 = 128 + 64 + 32 + 16 + 8 + 4 + 0 + 0 = 252$$



255 = 11111111

256 = 0000001 11111111

1 binary digit = Bit = 1

4 binary digits (4 bits) = Nibble = 1010

8 binary digits (8 bits) = Byte = 11101110

1/0 = Bit

1111/1010/0000/1110 = Nibble

11111111/00000000/10101010 = Byte

1 byte = 8 bits

2 bytes = 16 bits

# TYPES OF INPUT



$$11010010 = 128 + 64 + 0 + 16 + 0 + 0 + 2 + 0 = 210$$

00000000 = A

00000001 = B

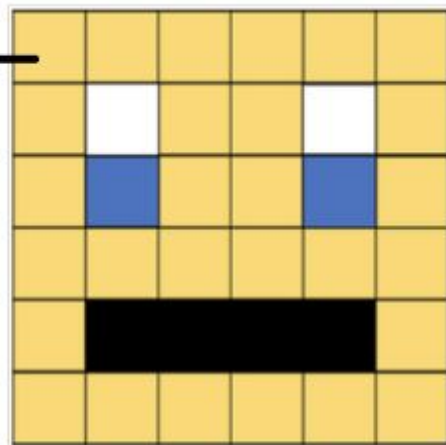
00000010 = C

A = 65 (DECIMAL) = 01000001 =  $0 + 64 + 0 + 0 + 0 + 0 + 0 + 0 + 1 = 65$

01000001 (65) = A

ASCII = 7 bits = 127

Pixel ←



10	10	10	10	10	10	101010101010
10	00	10	10	00	10	100010100010
10	11	10	10	11	10	101110101110
10	10	10	10	10	10	101010101010
10	10	10	10	10	10	100101010110
10	01	01	01	01	10	101010101010
10	10	10	10	10	10	

	00
	01
	10
	11

## ASCII CODE - American Standard Code for Information Interchange

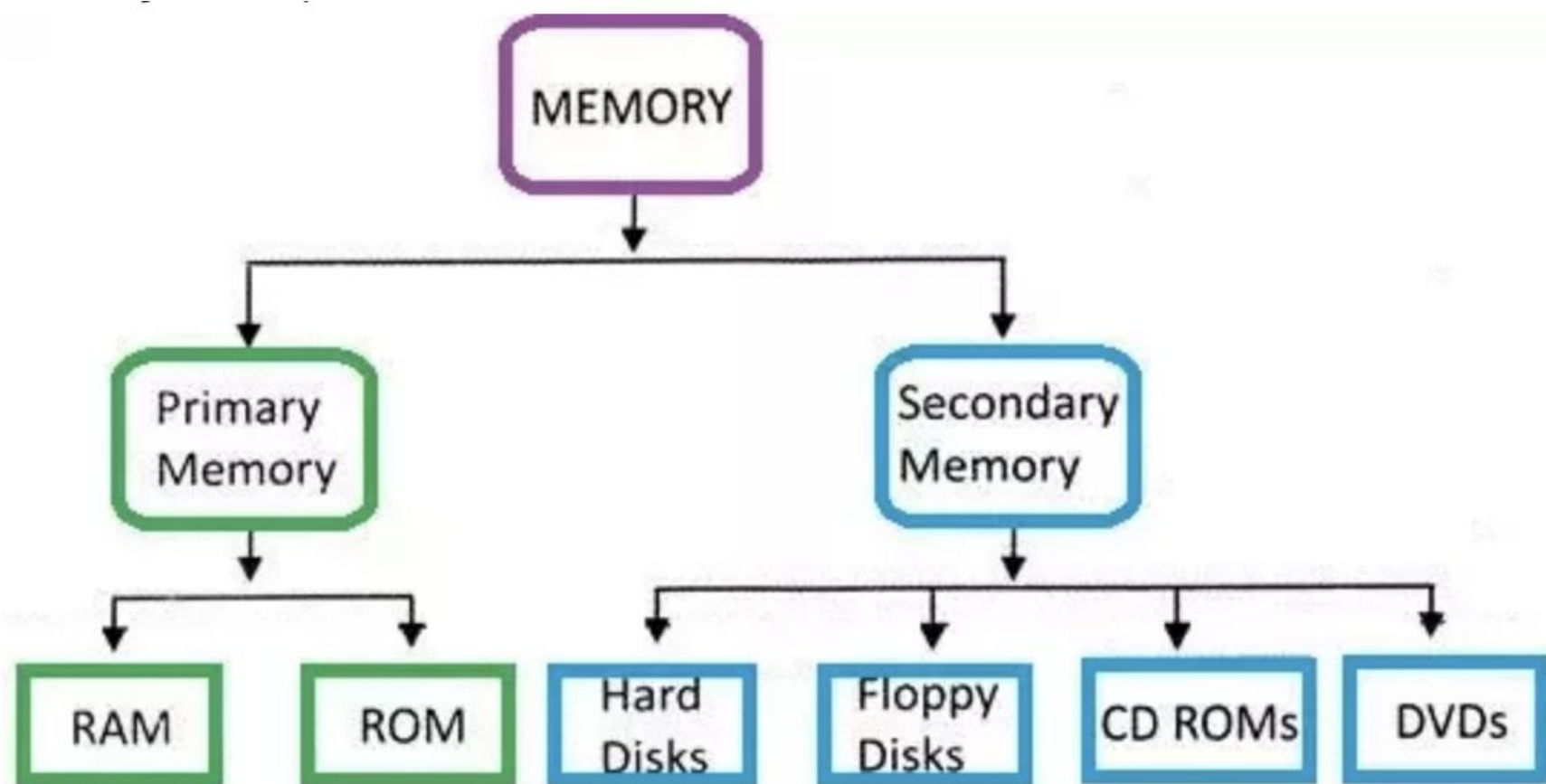
0	<u>NUL</u>	16	<u>DLE</u>	32	<u>SP</u>	48	0	64	@	80	P	96	`	112	p
1	<u>SOH</u>	17	<u>DC1</u>	33	!	49	1	65	A	81	Q	97	a	113	q
2	<u>STX</u>	18	<u>DC2</u>	34	"	50	2	66	B	82	R	98	b	114	r
3	<u>ETX</u>	19	<u>DC3</u>	35	#	51	3	67	C	83	S	99	c	115	s
4	<u>EOT</u>	20	<u>DC4</u>	36	\$	52	4	68	D	84	T	100	d	116	t
5	<u>ENQ</u>	21	<u>NAK</u>	37	%	53	5	69	E	85	U	101	e	117	u
6	<u>ACK</u>	22	<u>SYN</u>	38	&	54	6	70	F	86	V	102	f	118	v
7	<u>BEL</u>	23	<u>ETB</u>	39	'	55	7	71	G	87	W	103	g	119	w
8	<u>BS</u>	24	<u>CAN</u>	40	(	56	8	72	H	88	X	104	h	120	x
9	<u>HT</u>	25	<u>EM</u>	41	)	57	9	73	I	89	Y	105	i	121	y
10	<u>LF</u>	26	<u>SUB</u>	42	*	58	:	74	J	90	Z	106	j	122	z
11	<u>VT</u>	27	<u>ESC</u>	43	+	59	;	75	K	91	[	107	k	123	{
12	<u>FF</u>	28	<u>FS</u>	44	,	60	<	76	L	92	\	108	l	124	
13	<u>CR</u>	29	<u>GS</u>	45	-	61	=	77	M	93	]	109	m	125	}
14	<u>SO</u>	30	<u>RS</u>	46	.	62	>	78	N	94	^	110	n	126	~
15	<u>SI</u>	31	<u>US</u>	47	/	63	?	79	O	95	_	111	o	127	<u>DEL</u>

UNICODE = 8/16/32

test.txt

ABCD = 8 + 8 + 8 + 8





11011101