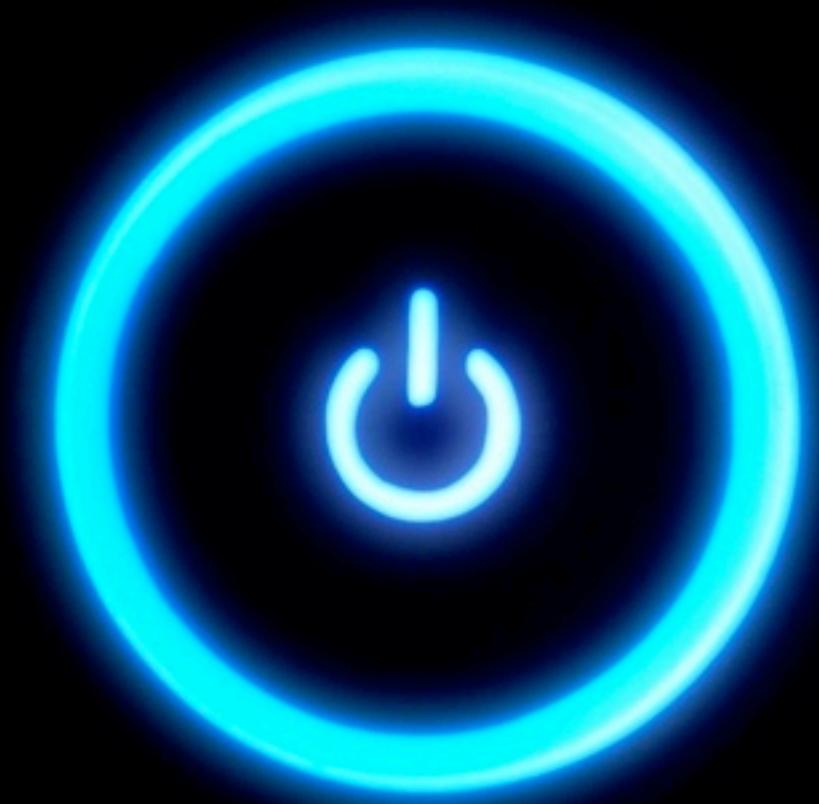
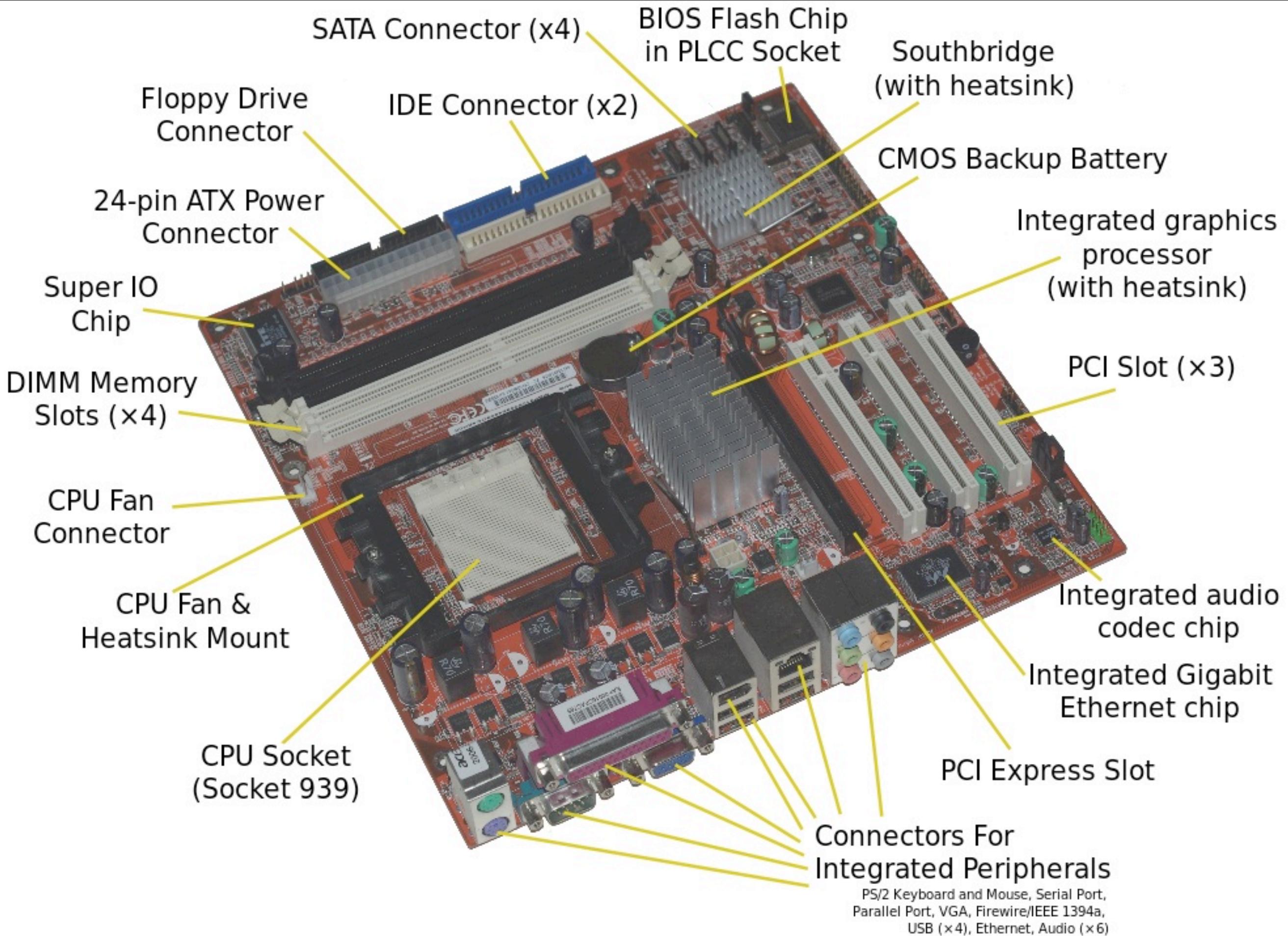


Computer Science E- I

Lecture I: Hardware

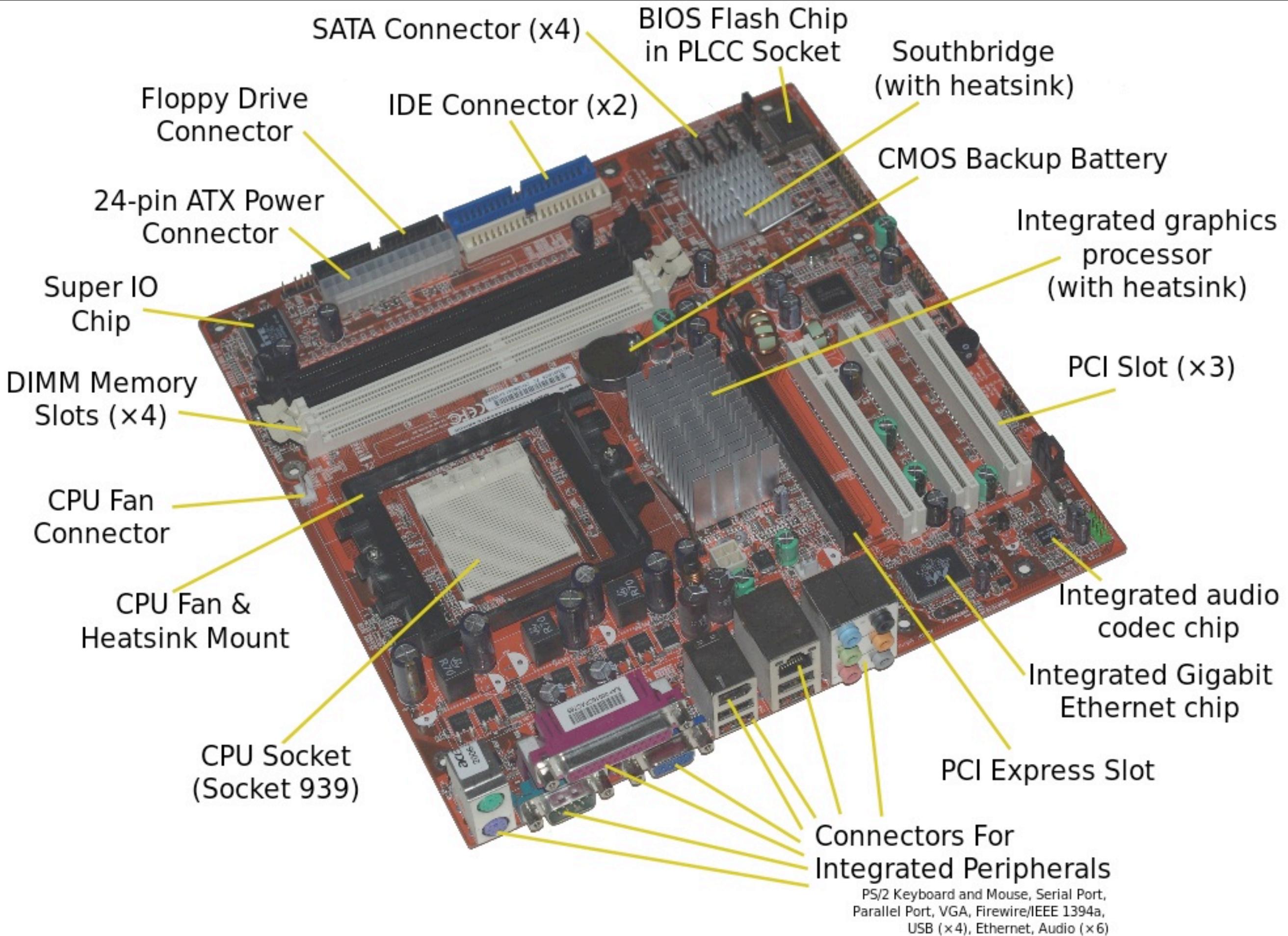




Power Supply

BIOS

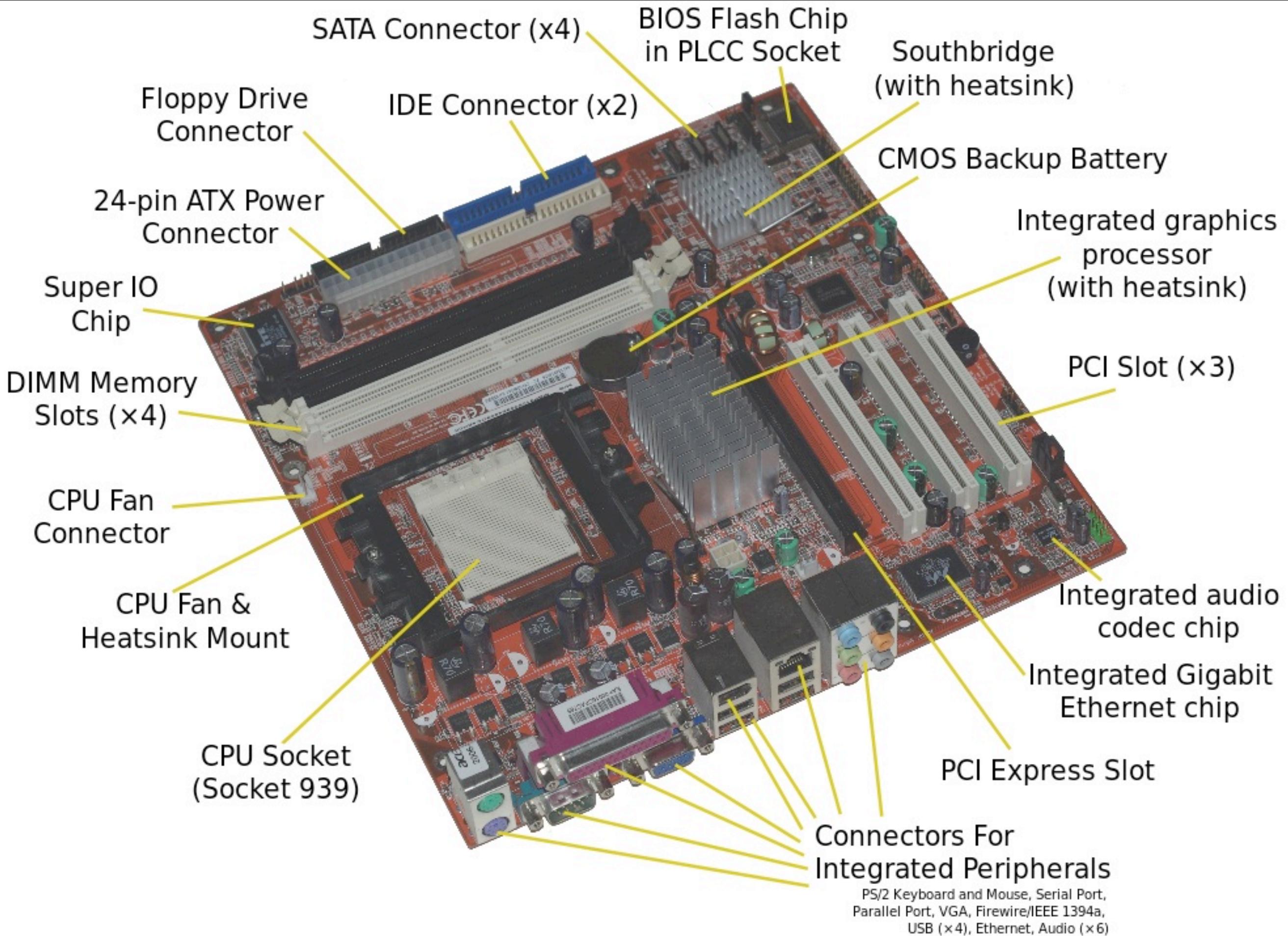
CMOS

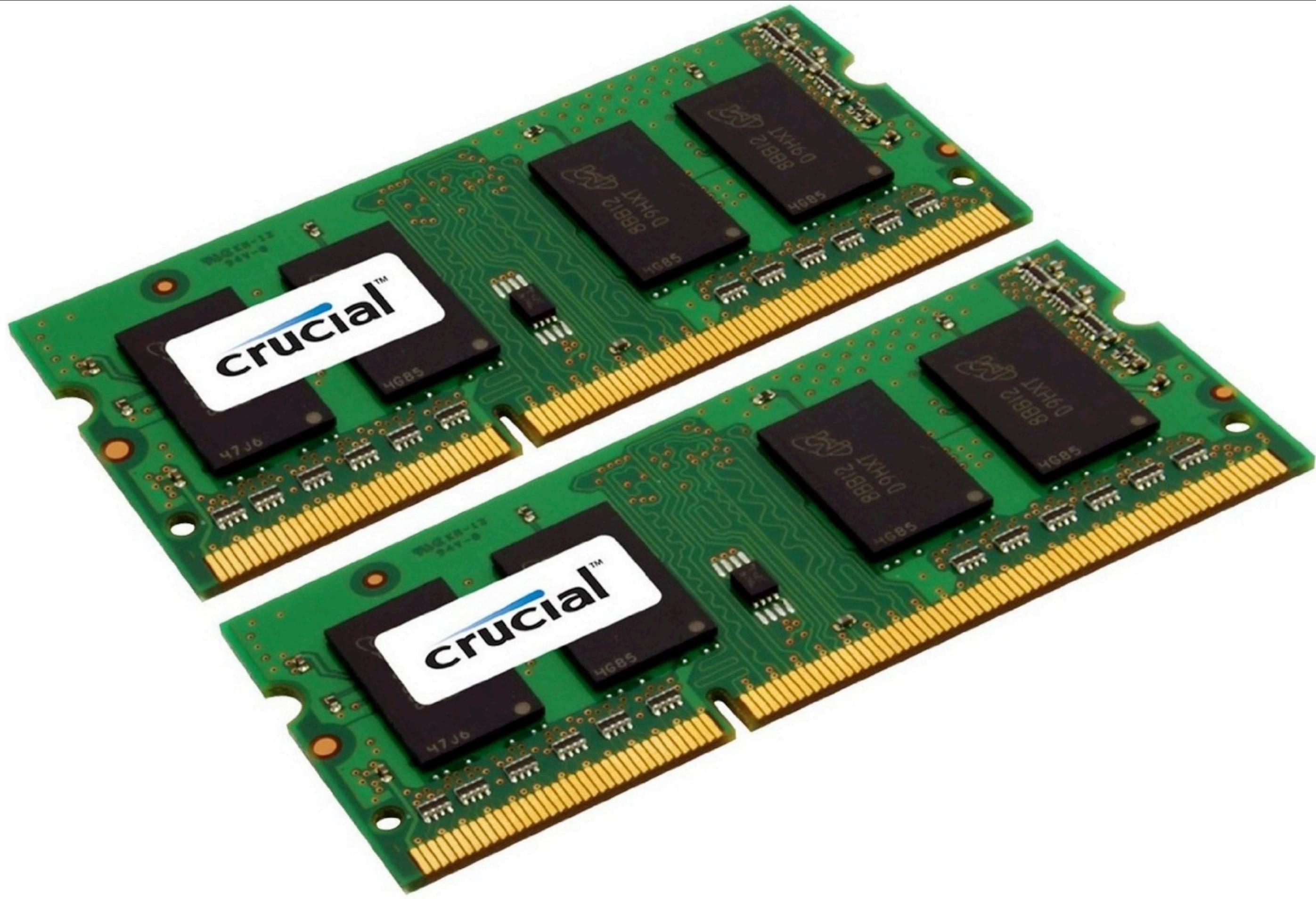




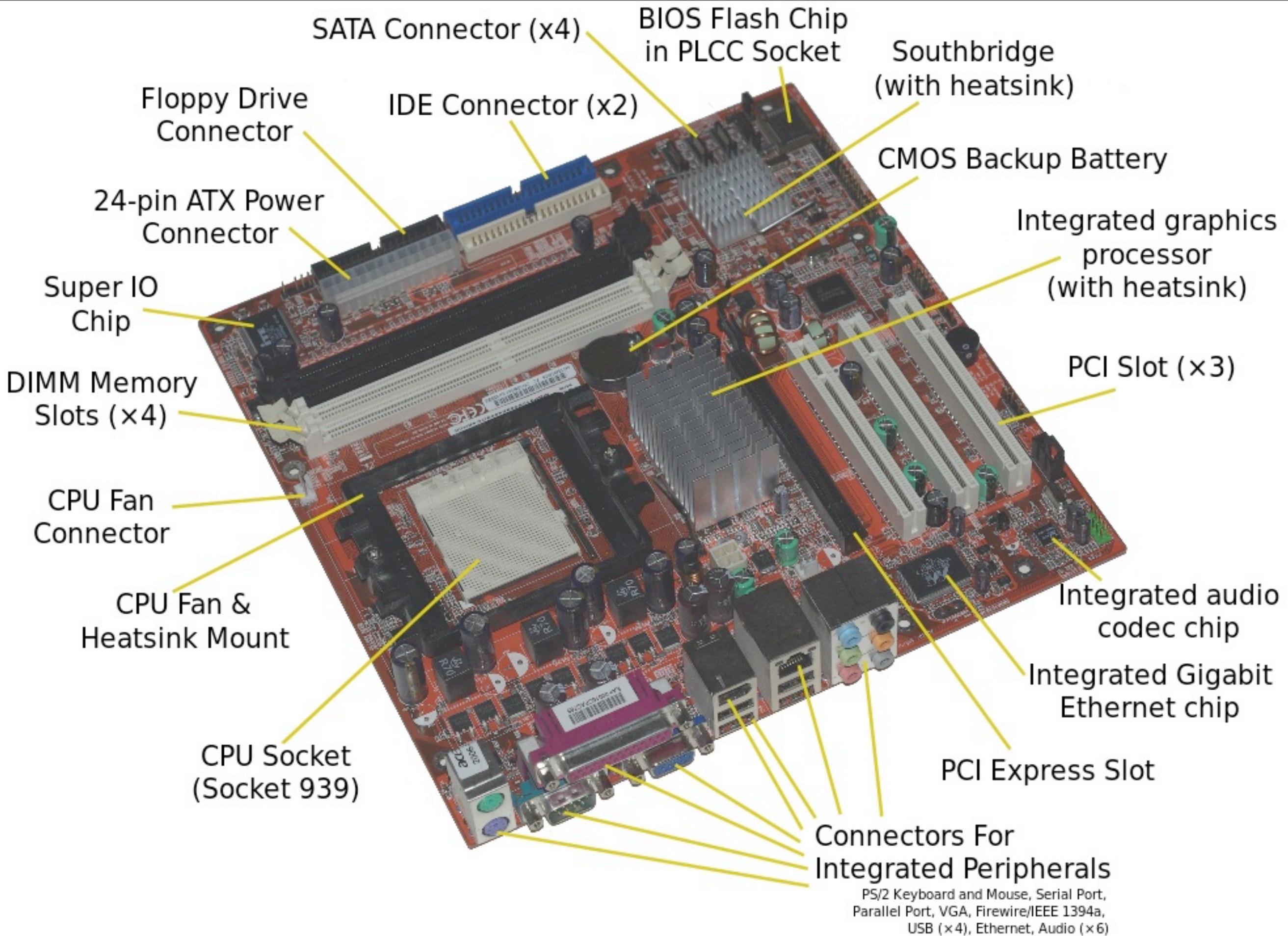
POST

Memory





Peripherals





USB-A



USB-B



USB-MINI4A



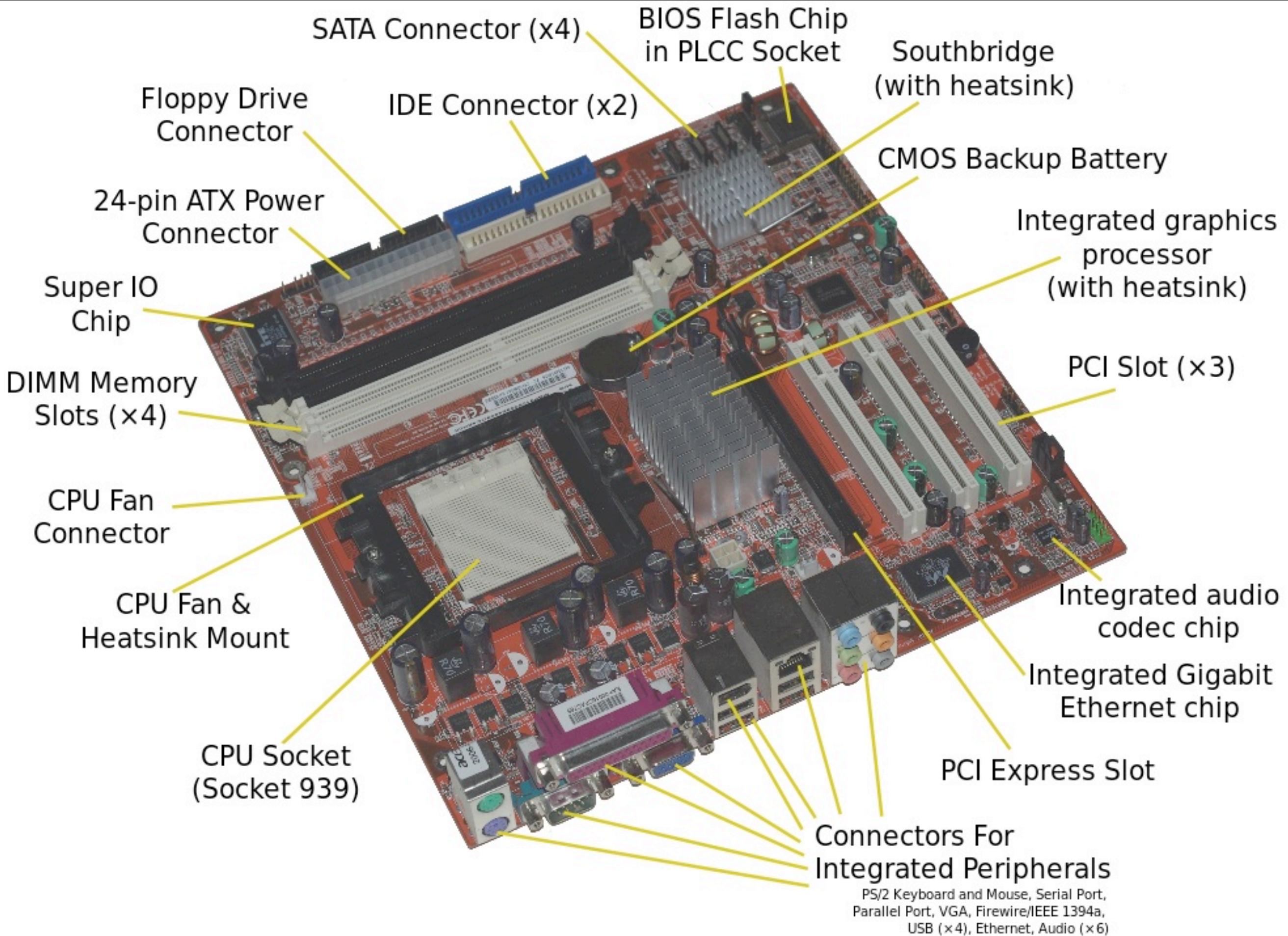
USB-MINI4B



USB-MINI5A



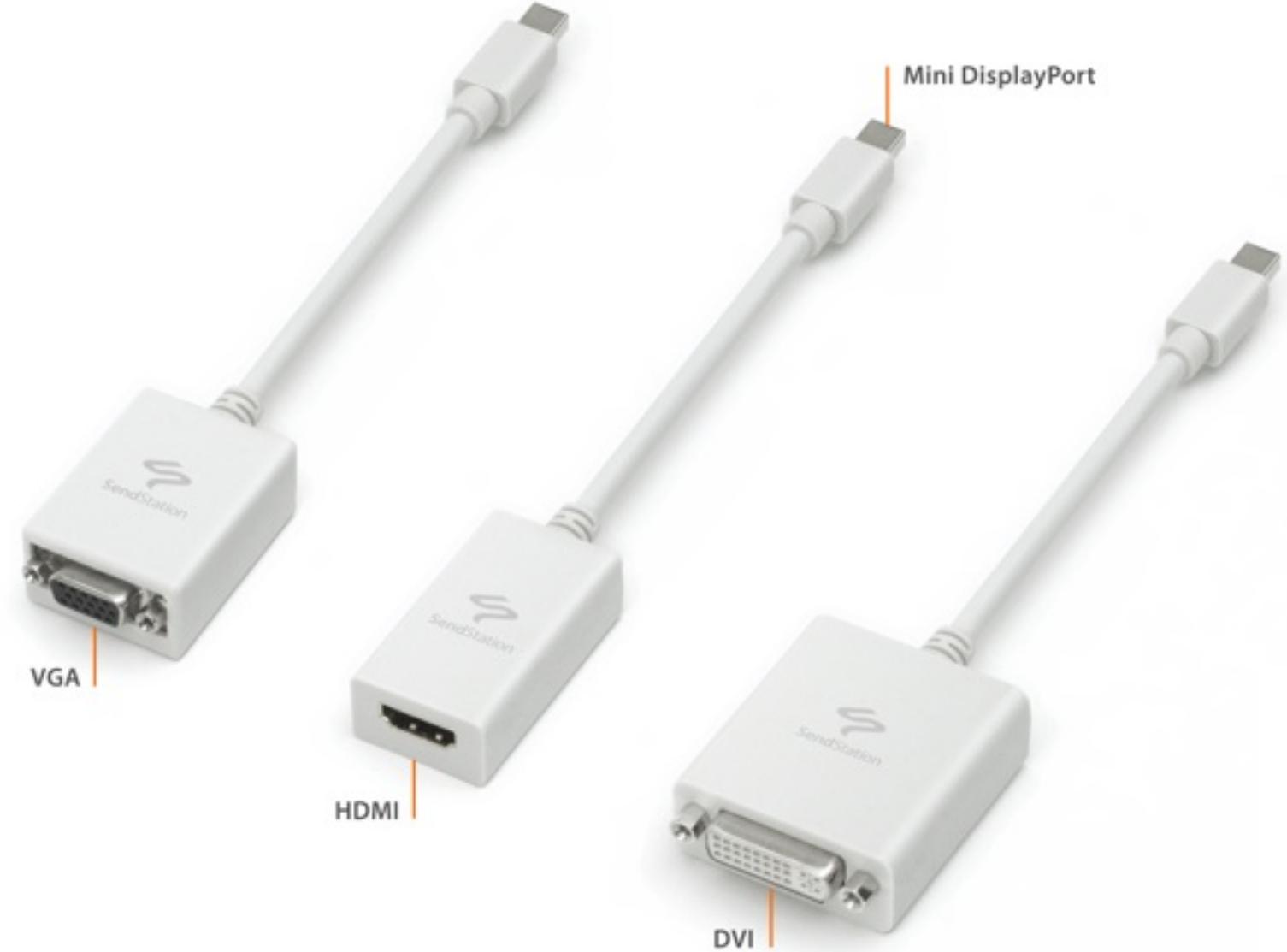
USB-MINI5B













Compare

[AudioQuest - Coffee 3.3' HDMI Cable - Brown/Black](#)

Model: 65-081-02 SKU: 1267719

From our expanded online assortment; compatible with most HDMI-enabled devices; silver-plated long-grain copper conductors; dielectric-bias system; audio return channel enabled

Customer Reviews: Be the first to write a review.

[Check Shipping & Availability ›](#)

\$495.99

- [Free Shipping](#)
- [18-Month Financing](#)
- [Get 4% Back in Rewards: See How](#)

[Add to Cart](#)



Compare

[AudioQuest - Carbon 16.4' HDMI Cable - Platinum White](#)

Model: 65-078-27 SKU: 9892812

From our expanded online assortment; connects 2 HDMI-enabled devices; long-grain copper design; high-speed audio return channel

Customer Reviews: Be the first to write a review.

[Check Shipping & Availability ›](#)

\$479.99

- [Free Shipping](#)
- [18-Month Financing](#)
- [Get 4% Back in Rewards: See How](#)

[Add to Cart](#)



Compare

[AudioQuest - Vodka 9.8' HDMI Cable - Blue/Black](#)

Model: 65-079-04 SKU: 1267873

From our expanded online assortment; compatible with most HDMI-enabled devices; silver-plated long-grain copper conductors; audio return channel enabled

Customer Reviews: Be the first to write a review.

[Check Shipping & Availability ›](#)

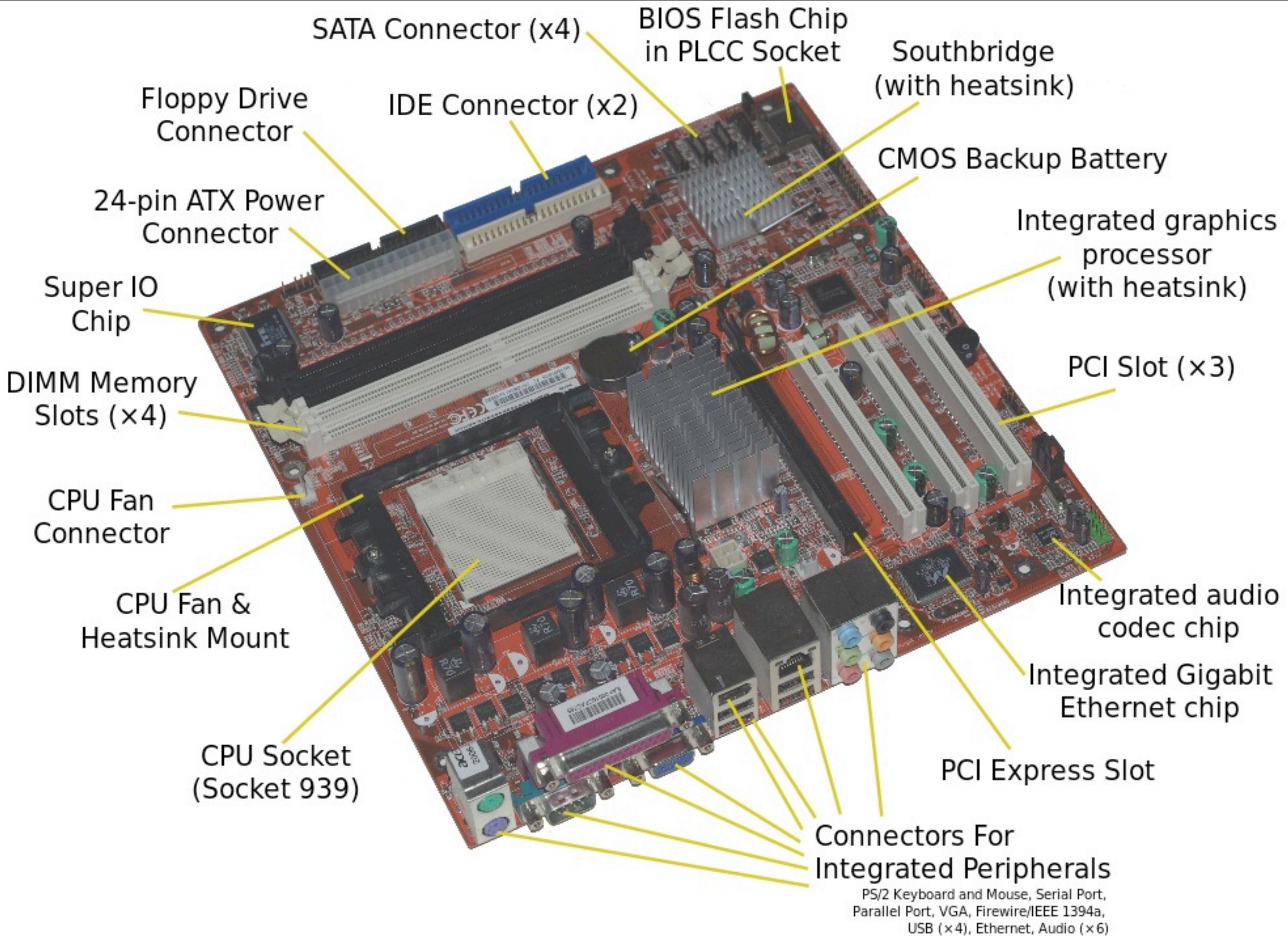
\$459.99

- [Free Shipping](#)
- [18-Month Financing](#)
- [Get 4% Back in Rewards: See How](#)

[Add to Cart](#)

[http://www.youtube.com/watch?
v=rdlWkytq_q4](http://www.youtube.com/watch?v=rdlWkytq_q4)

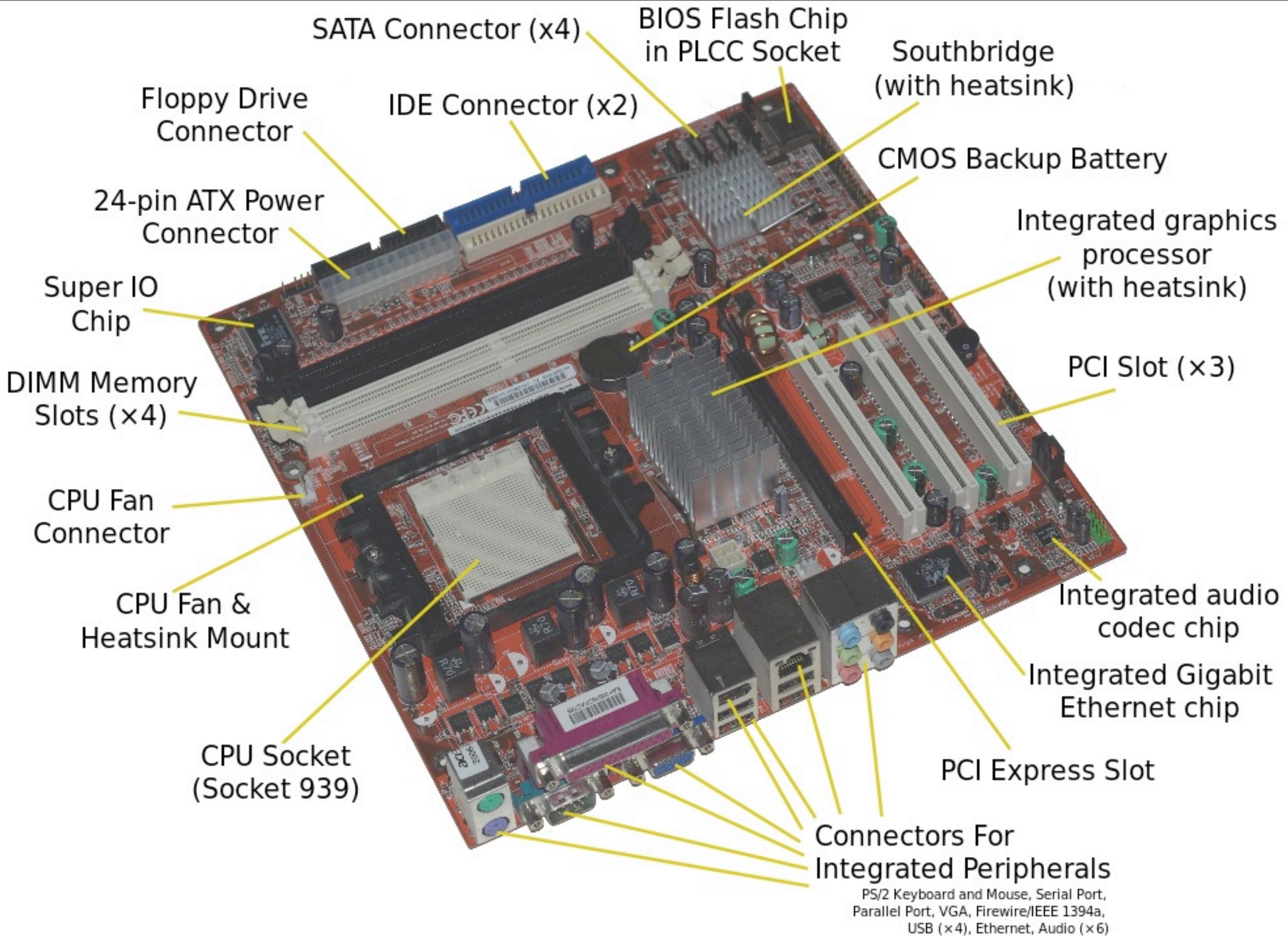
Hard drive

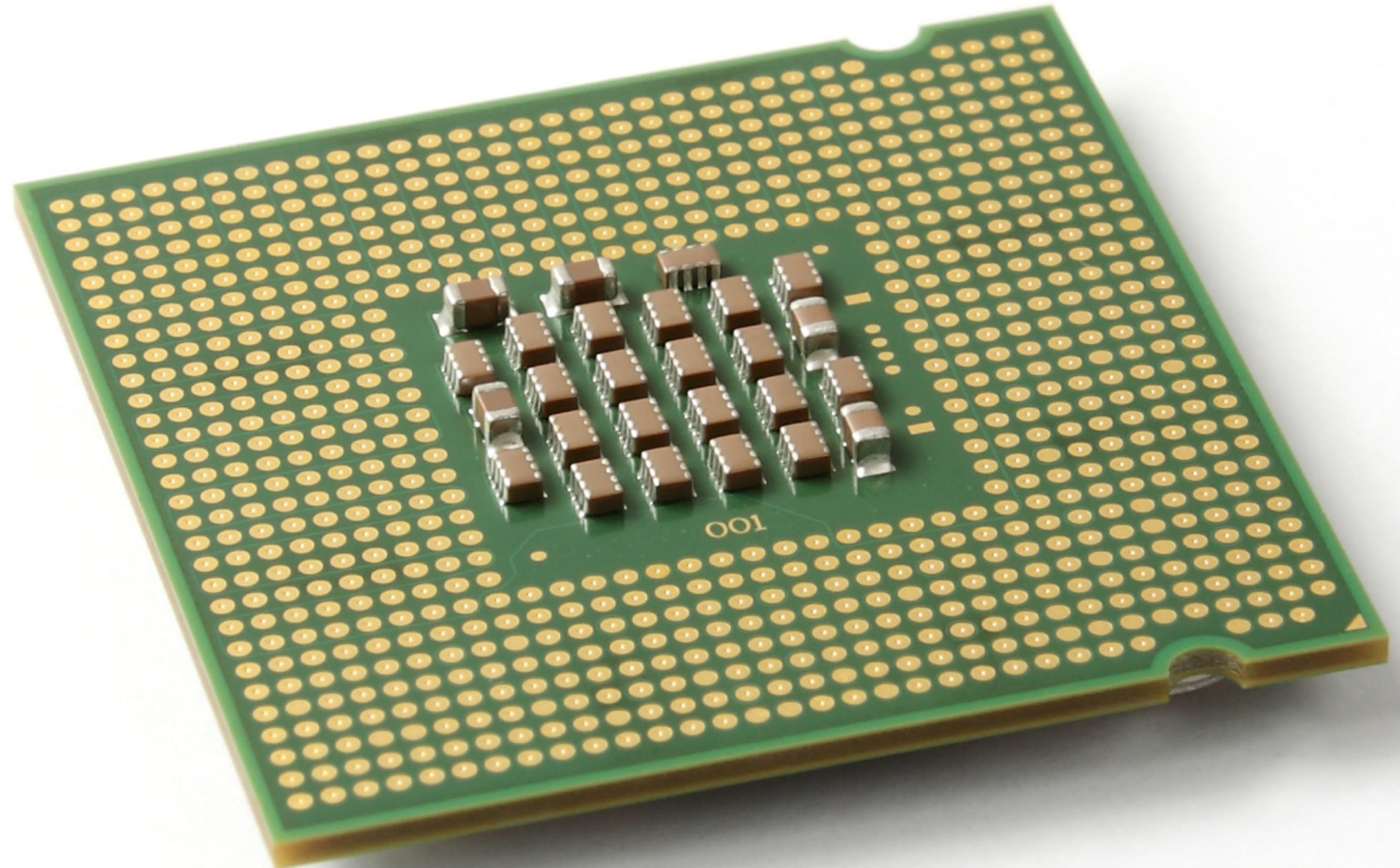


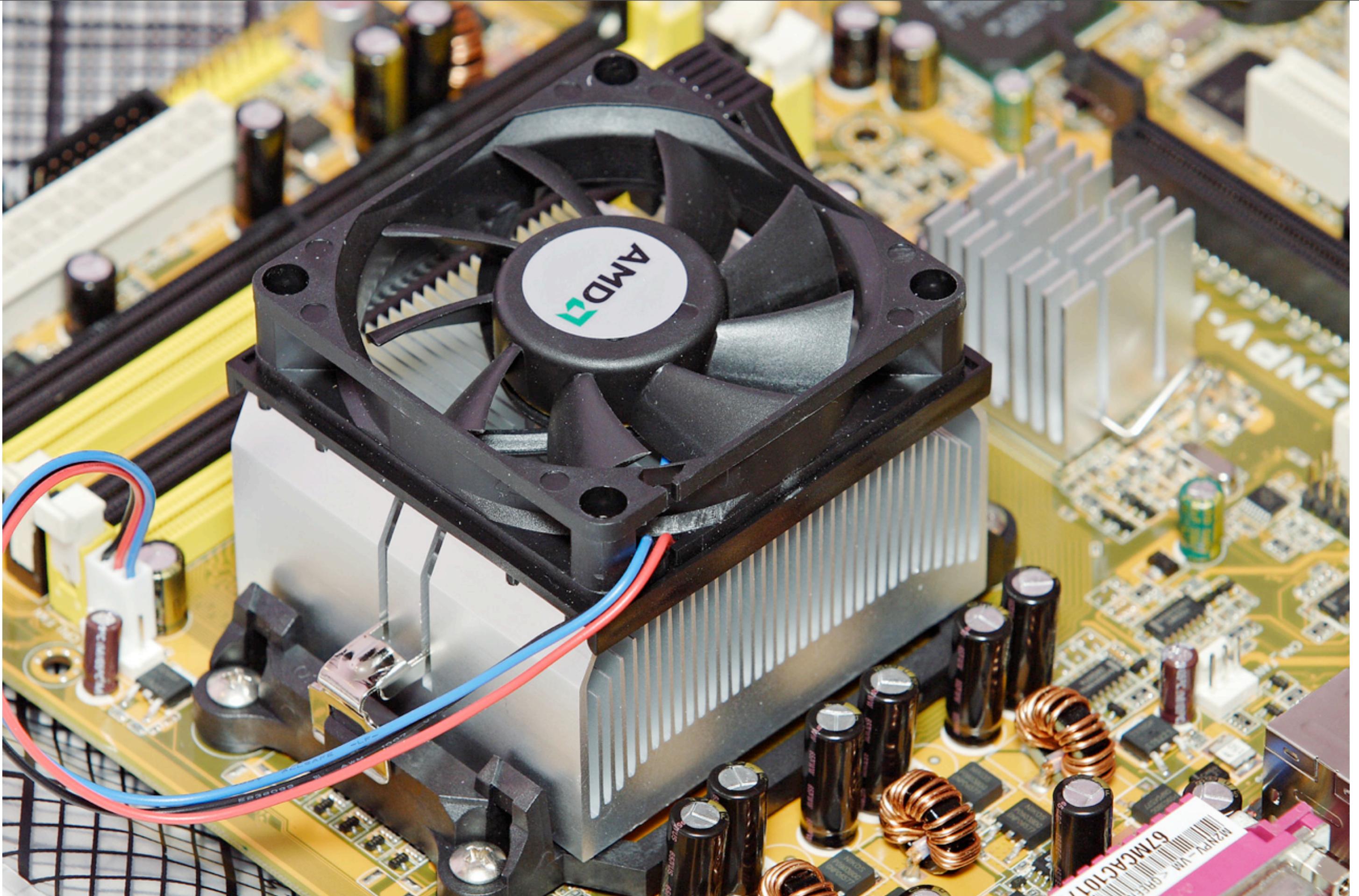


Kernel

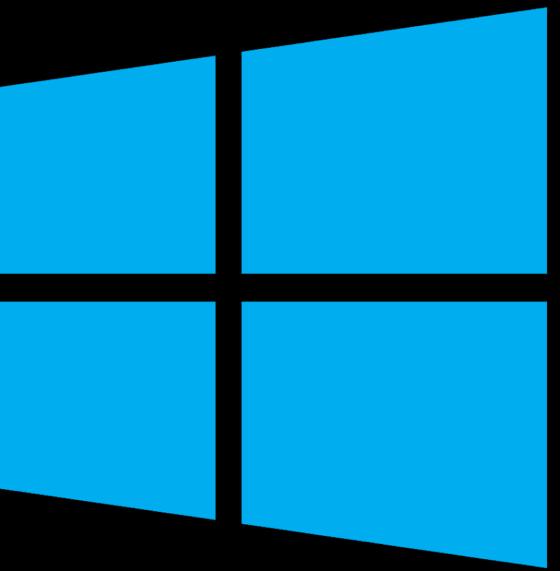
CPU



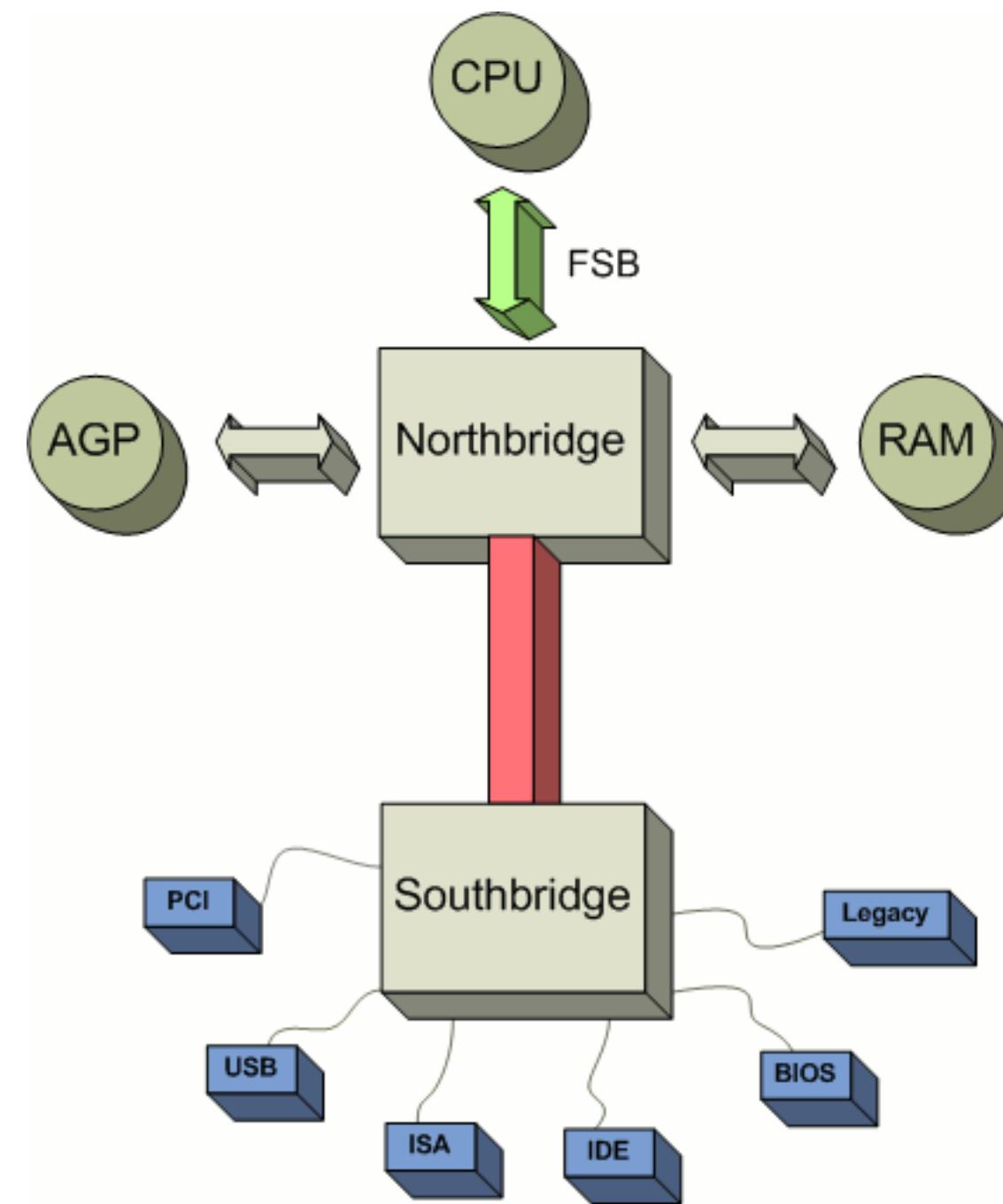




Operating Systems

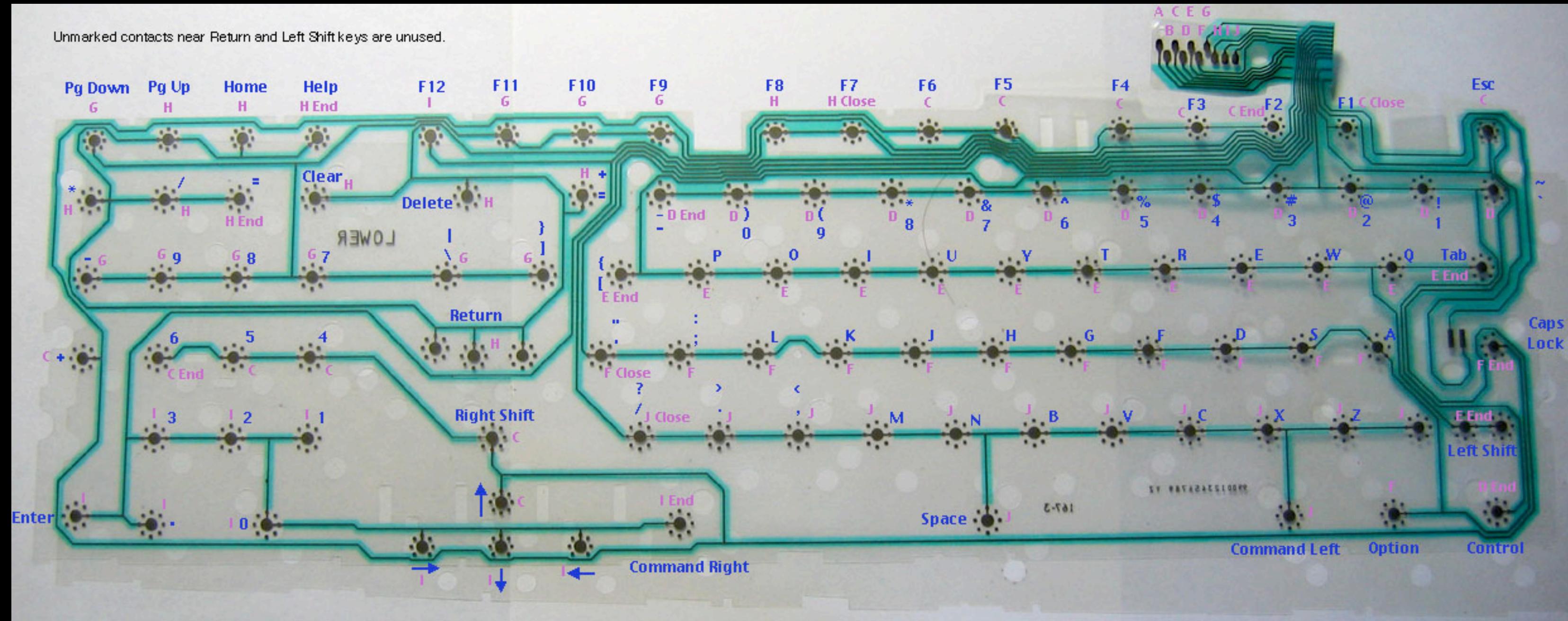


Windows® 8

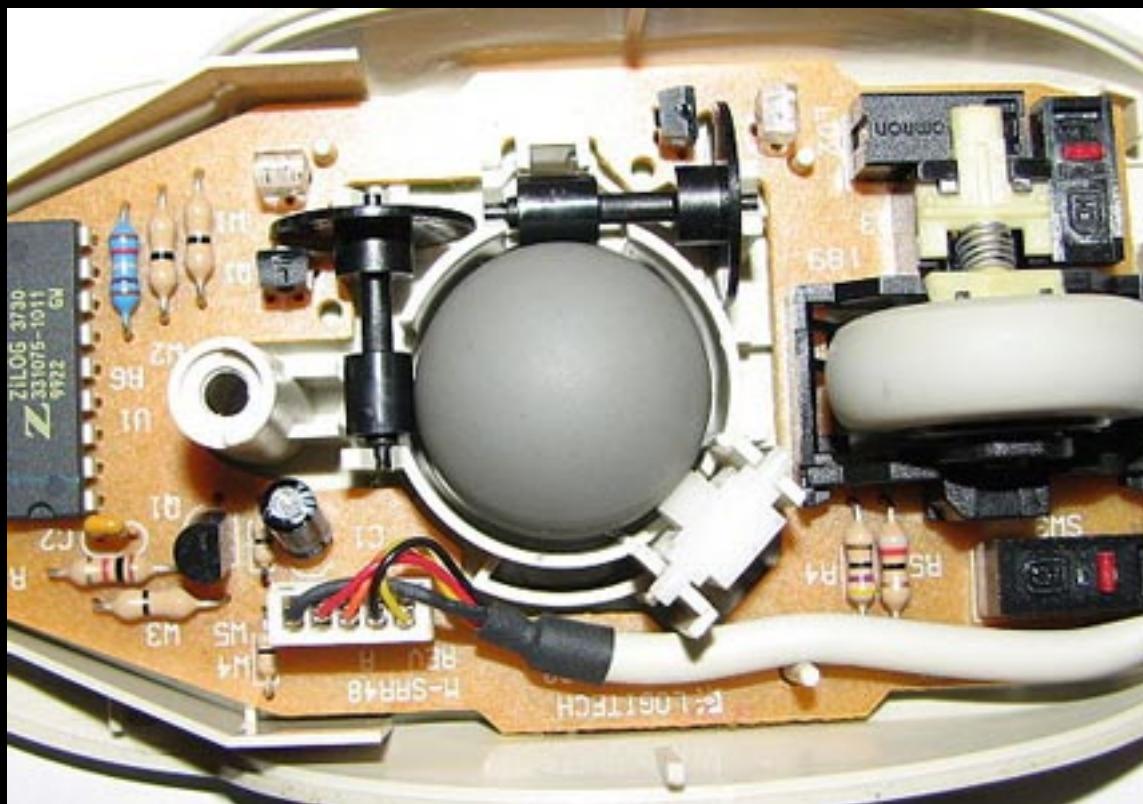


Keyboard

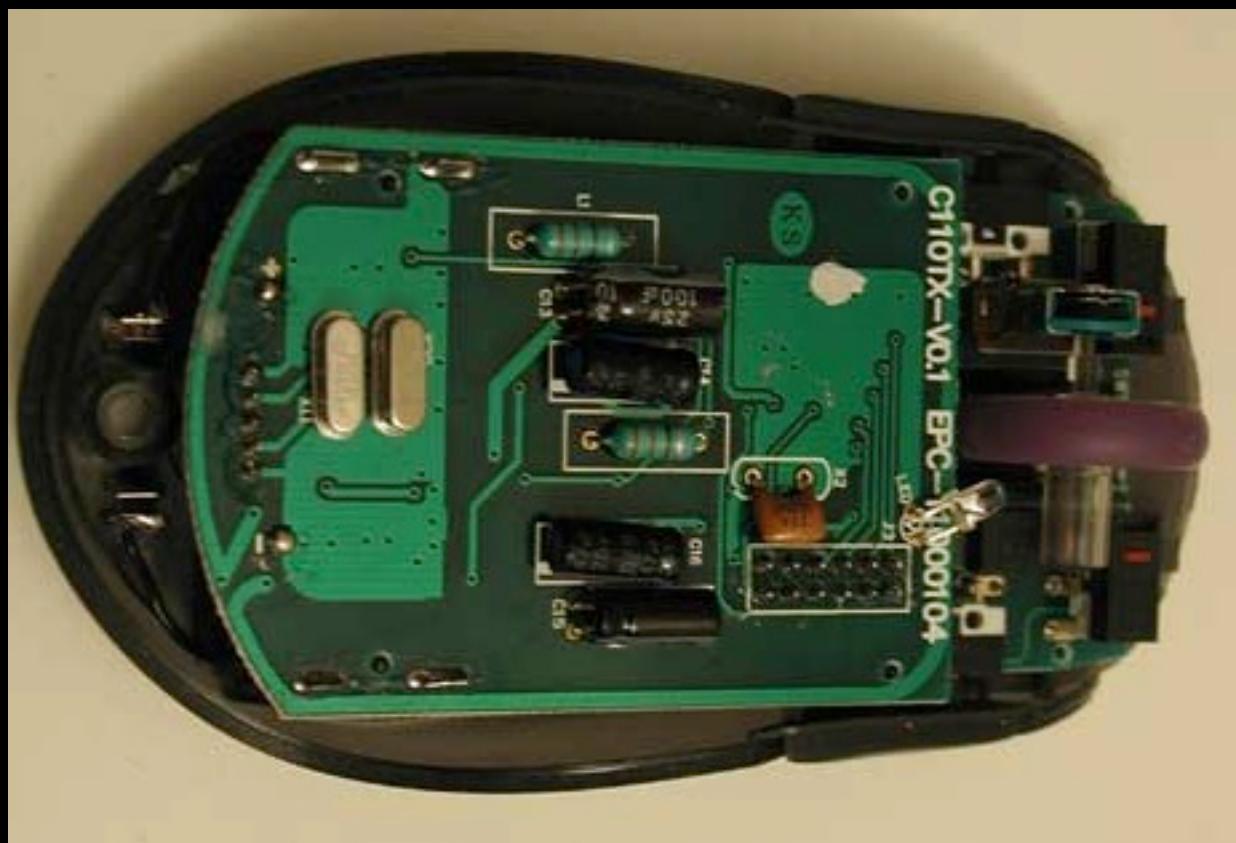
Unmarked contacts near Return and Left Shift keys are unused.



Mouse



[http://www.youtube.com/watch?
v=74W-QNudReo](http://www.youtube.com/watch?v=74W-QNudReo)



Lectures

Recaps

Sections

Problem Sets

Discuss

Exams

Final Project

Part I: Hardware

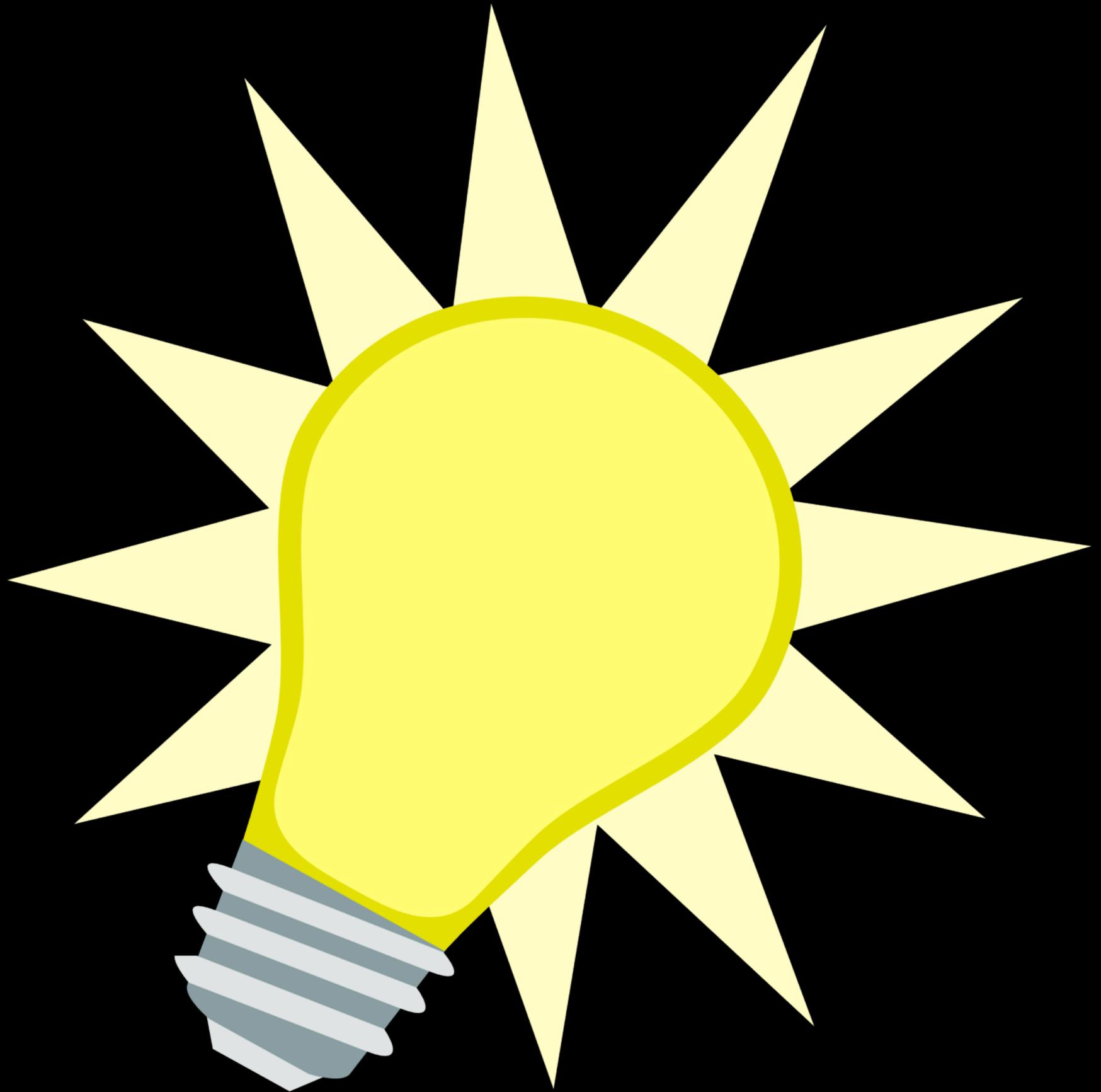
Part II: Internet

Part III: Security

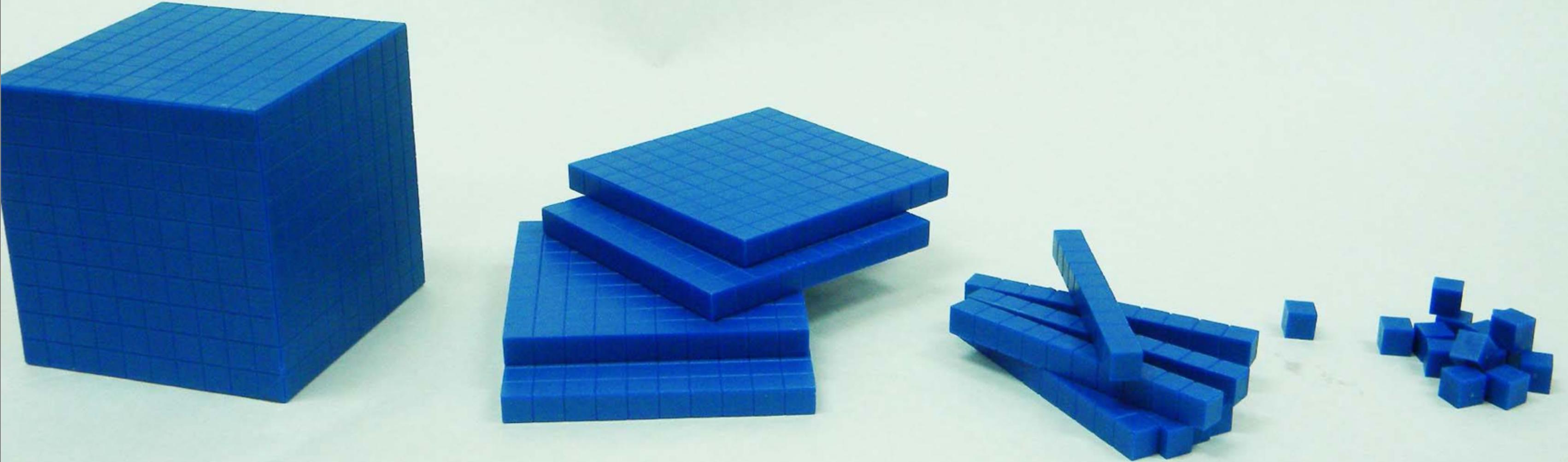
Part IV: Software Development

01010100101010010101000010101010
0101010100101010101011101011010101
00010101010110100100100100101110
1010011010100101001001001010100100
0101010010101010101001001001010101
00100101001010101010010010101010101
010100010100101100100100100100100

Do you like cats?



How much do you like cats?



1000 100 10 1

8

4

2

1

0

0
|

00
01
10

$$(1 \times 2) + (0 \times 1) = 2 + 0 = 2$$

00
01
10
11

$$(| \times 2) + (| \times |) = 2 + | = 3$$

000
001
011
100

$$(1 \times 4) + (0 \times 2) + (0 \times 1) = 4$$

000

001

011

100

101

$$(1 \times 4) + (0 \times 2) + (1 \times 1) = 5$$

10110

$$\begin{array}{r} \underline{1} \\ - 0 \\ \hline 2^4 \end{array} \quad \begin{array}{r} \underline{1} \\ - 1 \\ \hline 2^3 \end{array} \quad \begin{array}{r} \underline{1} \\ - 1 \\ \hline 2^2 \end{array} \quad \begin{array}{r} \underline{1} \\ - 1 \\ \hline 2^1 \end{array} \quad \begin{array}{r} \underline{0} \\ - 0 \\ \hline 2^0 \end{array}$$

$$(1 \times 2^4) + (0 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (0 \times 2^0)$$

$$(1 \times 2^4) + (0 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (0 \times 2^0)$$

$$16 + 0 + 4 + 2 + 0$$

$$(1 \times 2^4) + (0 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (0 \times 2^0)$$

$$16 + 0 + 4 + 2 + 0$$

22



|4

2^4

2^3

2^2

2^1

2^0

$$\begin{array}{r} \underline{\mathbf{0}} \\ - \\ 2^4 \\ - \\ 2^3 \\ - \\ 2^2 \\ - \\ 2^1 \\ - \\ 2^0 \end{array}$$

$$\begin{array}{r} \underline{\textbf{0}} \\ - \\ \underline{\textbf{2}^4} \end{array} \qquad \begin{array}{r} \textbf{1} \\ - \\ \underline{\textbf{2}^3} \end{array} \qquad \begin{array}{r} \\ - \\ \underline{\textbf{2}^2} \end{array} \qquad \begin{array}{r} \\ - \\ \underline{\textbf{2}^1} \end{array} \qquad \begin{array}{r} \\ - \\ \underline{\textbf{2}^0} \end{array}$$

$$\begin{array}{r} \underline{0} \\ - \underline{1} \\ \hline 2^4 \\ \underline{-1} \\ \hline 2^3 \\ \hline \underline{1} \\ - \underline{2} \\ \hline 2^2 \\ \hline \underline{1} \\ - \underline{2} \\ \hline 2^1 \\ \hline \underline{1} \\ - \underline{2} \\ \hline 2^0 \end{array}$$

$$\begin{array}{r} \underline{\textbf{0}} \\ - \\ \underline{\textbf{1}} \\ - \\ \underline{\textbf{1}} \\ - \\ \underline{\textbf{1}} \\ - \\ \underline{\textbf{2}^0} \end{array}$$

2^4

2^3

2^2

2^1

2^0

$$\begin{array}{r} \underline{\mathbf{0}} \\ - \\ \underline{\mathbf{1}} \\ - \\ \underline{\mathbf{1}} \\ - \\ \underline{\mathbf{1}} \\ - \\ \underline{\mathbf{0}} \\ - \\ \underline{\mathbf{2^4}} \\ - \\ \underline{\mathbf{2^3}} \\ - \\ \underline{\mathbf{2^2}} \\ - \\ \underline{\mathbf{2^1}} \\ - \\ \underline{\mathbf{2^0}} \end{array}$$

$$0011 + 0110$$

$$\begin{array}{r} 0 \quad 0 \quad | \quad | \\ + \quad 0 \quad | \quad | \quad 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \quad 0 \quad | \quad | \\ + \quad 0 \quad | \quad | \quad 0 \\ \hline \quad \quad \quad \quad | \end{array}$$

$$\begin{array}{r} & & | & & \\ & 0 & 0 & | & | \\ + & 0 & | & | & 0 \\ \hline & 0 & | & & \end{array}$$

$$\begin{array}{r} & | & | \\ & 0 & 0 & | & | \\ + & 0 & | & | & 0 \\ \hline & 0 & 0 & | \end{array}$$

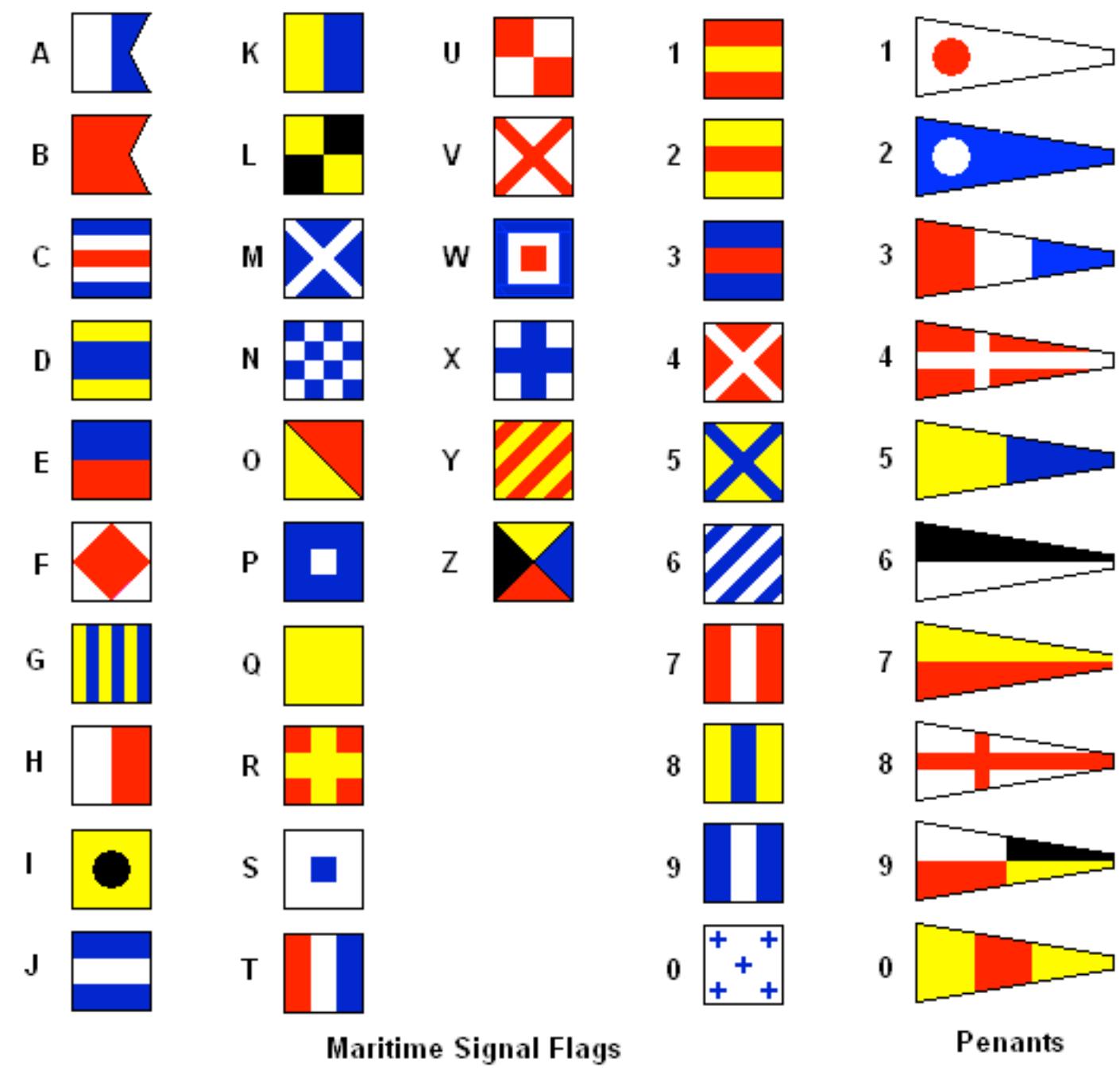
$$\begin{array}{r} & | & | \\ & 0 & 0 & | & | \\ + & 0 & | & | & 0 \\ \hline & | & 0 & 0 & | \end{array}$$

There are 10 types of people in
the world: those who understand
binary and those who don't.



there are 10 types
of people in the
world: people who
understand binary,
and people who
have friends

Character encodings



A	• -	J	• -----	S	• • •
B	- • • •	K	- • -	T	-
C	- • - •	L	• - • •	U	• • -
D	- • •	M	--	V	• • • -
E	•	N	- •	W	• - -
F	• • - •	O	---	X	- • • -
G	-- •	P	• --- •	Y	- • - -
H	• • • •	Q	-- • -	Z	-- • •
I	• •	R	• - •		

ASCII

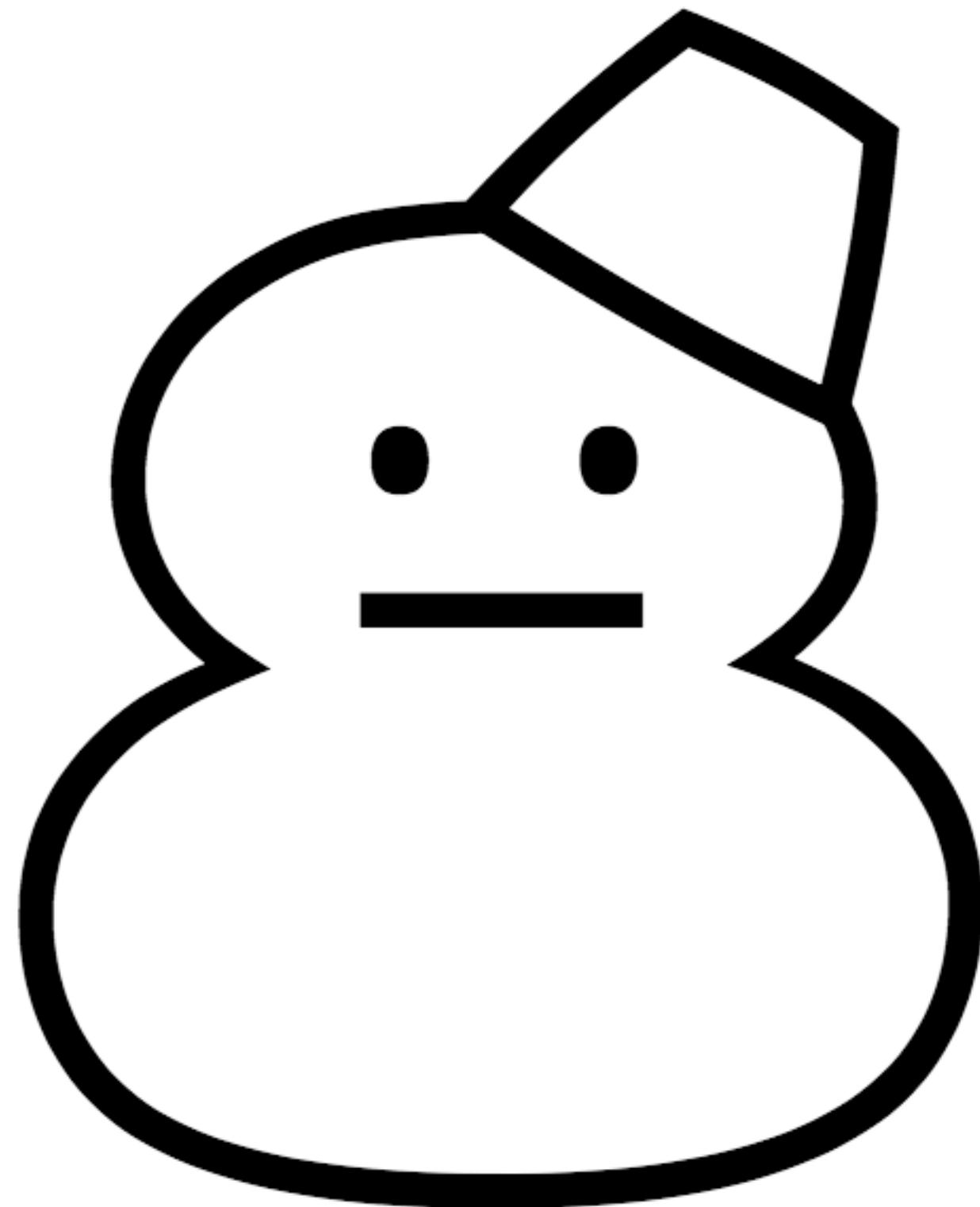
Dec	Hx	Oct	Char		Dec	Hx	Oct	Html	Chr		Dec	Hx	Oct	Html	Chr		Dec	Hx	Oct	Html	Chr	
0	0 000	NUL	(null)		32	20 040	 	Space			64	40 100	@	Ø	96	60 140	`	`				
1	1 001	SOH	(start of heading)		33	21 041	!	!	!		65	41 101	A	A	97	61 141	a	a				
2	2 002	STX	(start of text)		34	22 042	"	"	"		66	42 102	B	B	98	62 142	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	0		80	50 120	P	P	112	70 160	p	p				
17	11 021	DC1	(device control 1)		49	31 061	1	1	1		81	51 121	Q	Q	113	71 161	q	q				
18	12 022	DC2	(device control 2)		50	32 062	2	2	2		82	52 122	R	R	114	72 162	r	r				
19	13 023	DC3	(device control 3)		51	33 063	3	3	3		83	53 123	S	S	115	73 163	s	s				
20	14 024	DC4	(device control 4)		52	34 064	4	4	4		84	54 124	T	T	116	74 164	t	t				
21	15 025	NAK	(negative acknowledge)		53	35 065	5	5	5		85	55 125	U	U	117	75 165	u	u				
22	16 026	SYN	(synchronous idle)		54	36 066	6	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	7		87	57 127	W	W	119	77 167	w	w				
24	18 030	CAN	(cancel)		56	38 070	8	8	8		88	58 130	X	X	120	78 170	x	x				
25	19 031	EM	(end of medium)		57	39 071	9	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		DEL				

Source: www.LookupTables.com

CS E-I

67 83 32 69 45 49

0|0000| | 0|0|00| | 00|0000
0|000|0| 00|0|0| 00|000|





- byte
- kilobyte
- megabyte
- gigabyte
- terabyte
- ...

What chair is everyone sitting in?

1. Ask the person to *your left* where he/she is sitting
2. If there is no one to *your left*, say “one”
3. Add one to the answer of the person to *your left*, and say it out loud

Computer Science E- I

Lecture I: Hardware