Information Layer

AP CSP @ SouthLake Christian Academy

Binary Review

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1. Convert 0b01001000 to decimal
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- 2. Convert 0b01101001 to decimal
- 3. Convert b00100001 to decimal
- 4. Convert 66 to binary
- 5. Convert 213 to binary

What other types of data do you use?

Text

To represent text, we map letters ("characters") to numbers.

How would you map a letter to a number?

ASCII

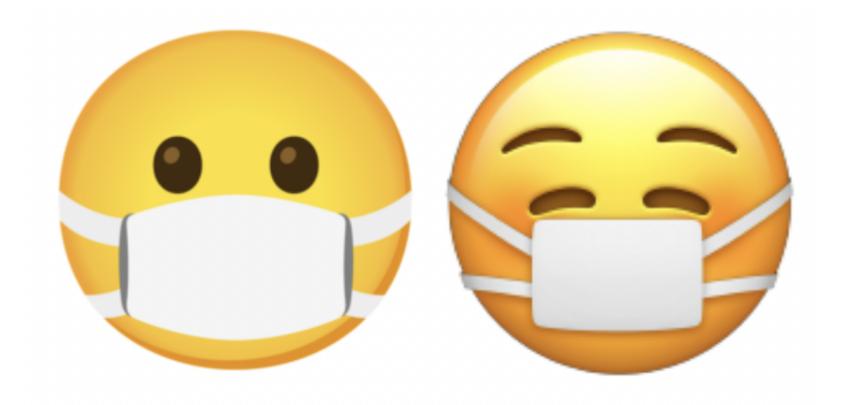
- American Standard Code for Information Interchange
- the standard mapping; includes uppercase, lowercase, and punctuation.
- uses 7 bits to indicate characters

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	Α	97	61	141	а
2	2	002	STX	34	22	042	II .	66	42	102	В	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	е
6	6	006	ACK	38	26	046	&	70	46	106	F	102	66	146	f
7	7	007	BEL	39	27	047	1	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	1	105	69	151	i
10	а	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	С	014	FF	44	2c	054	,	76	4c	114	L	108	6c	154	1
13	d	015	CR	45	2d	055	-	77	4d	115	M	109	6d	155	m
14	е	016	SO	46	2e	056		78	4e	116	N	110	6e	156	n
15	f	017	SI	47	2f	057	/	79	4f	117	0	111	6f	157	0
16	10	020	DLE	48	30	060	0	80	50	120	P	112	70	160	р
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	Т	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	Υ	121	79	171	у
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	١	124	7c	174	1
29	1d	035	GS	61	3d	075	=	93	5d	135	1	125	7d	175	}
30	1e	036	RS	62	3e	076	>	94	5e	136	٨	126	7e	176	~
31	1f	037	US	63	3f	077	?	95	5f	137	_	127	7f	177	DEL
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Unicode

- another way to indicate characters
- uses 32 bits
 - able to represent new characters and emojis

"face with medical mask"



11110000 10011111 10011000 10110111

Key Take Away

Data can be interpreted **by humans** as numbers or as text

$$0b01000001 = 65 = A$$