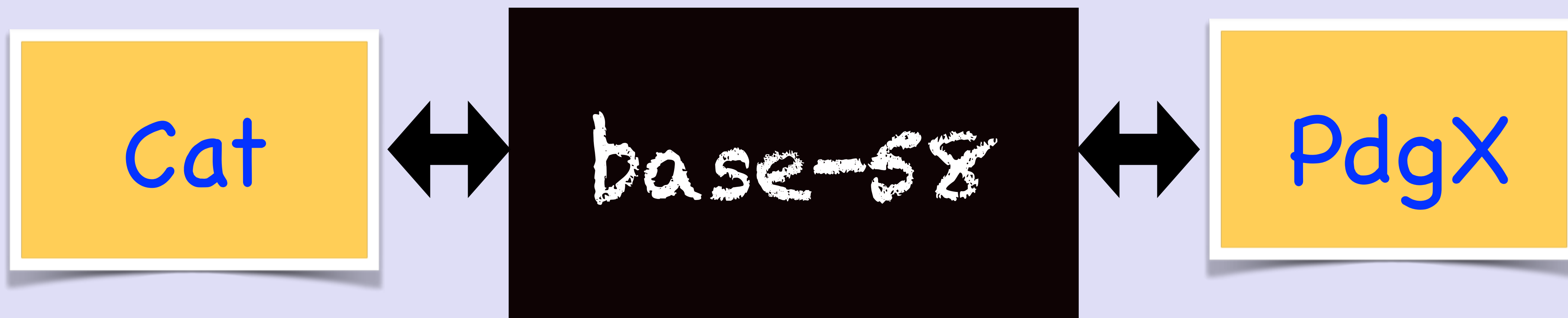


# BLOCKCHAIN TUTORIAL 13.1

## Base-58 encoding



# **BLOCKCHAIN TUTORIAL 13.1**

Base-58 encoding

# BASE-58

- Base-58 encode the word:

**C** **a** **t**

Character	ASCII dec value				
C	67	$67 * 2^{2*8}$	$67 * 2^{16}$	$67 * 65536$	<b>4390912</b>
a	97	$97 * 2^{1*8}$	$97 * 2^8$	$97 * 256$	<b>24832</b>
t	116	$116 * 2^{0*8}$	$116 * 2^0$	$116 * 1$	<b>116</b>
					<b>4415860</b>

- The word “Cat” in decimal representation: **4415860**

# BASE-58

- “Cat” decimal representation: **4415860**

Calculate	Equals	Remainder
$4415860 / 58$	76135	30
$76135 / 58$	1312	39
$1312 / 58$	22	36
$22 / 58$	0	22

- Remainder values: 22, 36, 39, 30



# BASE-58

- Base-58 encoding schemes also converts binary to alphanumeric text. It is similar to base-64 encoding without using 0 (zero), O (capital o), I (capital i), l (lowercase L), + (plus) and / (slash) because they look the same in some fonts.
- The base-58 symbol chart on the right is used in Bitcoin and is specific to the Bitcoin project.

Value	Character	Value	Character	Value	Character	Value	Character
0	1	1	2	2	3	3	4
4	5	5	6	6	7	7	8
8	9	9	A	10	B	11	C
12	D	13	E	14	F	15	G
16	H	17	J	18	K	19	L
20	M	21	N	22	P	23	Q
24	R	25	S	26	T	27	U
28	V	29	W	30	X	31	Y
32	Z	33	a	34	b	35	c
36	d	37	e	38	f	39	g
40	h	41	i	42	j	43	k
44	m	45	n	46	o	47	p
48	q	49	r	50	s	51	t
52	u	53	v	54	w	55	x
56	y	57	z				

# BASE-58

- Remainder values: 22, 36, 39, 30
- Lookup the remainder values in the base-58 symbol chart.
- “Cat” base-58 encoded = Pd<sub>g</sub>X
- Online converter:  
<http://www.mobilefish.com/services/cryptocurrency/brainwallet.html>

# BASE-58

- Base-58 encode the word:

**2** **8** **a**

Character	ASCII dec value				
2	50	$50 * 2^{2*8}$	$50 * 2^{16}$	$50 * 65536$	<b>3276800</b>
8	56	$56 * 2^{1*8}$	$56 * 2^8$	$56 * 256$	<b>14336</b>
a	97	$97 * 2^{0*8}$	$97 * 2^0$	$97 * 1$	<b>97</b>
					<b>3291233</b>

- The word “28a” in a decimal representation: **3291233**



# BASE-58

- “28a” decimal representation: **3291233**

Calculate	Equals	Remainder
$3291233 / 58$	56745	23
$56745 / 58$	978	21
$978 / 58$	16	50
$16 / 58$	0	16

- Remainder values: 16, 50, 21, 23



# BASE-58

- Remainder values: 16, 50, 21, 23
- Lookup the remainder values in the base-58 symbol chart.
- “28a” Base-58 encoded = HsNQ
- Online converter:  
<http://www.mobilefish.com/services/cryptocurrency/brainwallet.html>