```
1 #include <stdio.h>
2
3 int main() {
4   char capital_a = 'A';
5   char sixty_five = 65;
6
7   printf("capital_a:  %c %d\n", capital_a, capital_a);
8   printf("sixty_five: %c %d\n", sixty_five, sixty_five);
9 }
```

print formatted as (ASCII) character

print formatted as decimal number

no return?

```
$ gcc bits.c -o bits
$ ./bits
capital_a:  A 65
sixty_five: A 65
```

printed from line 7

printed from the 8

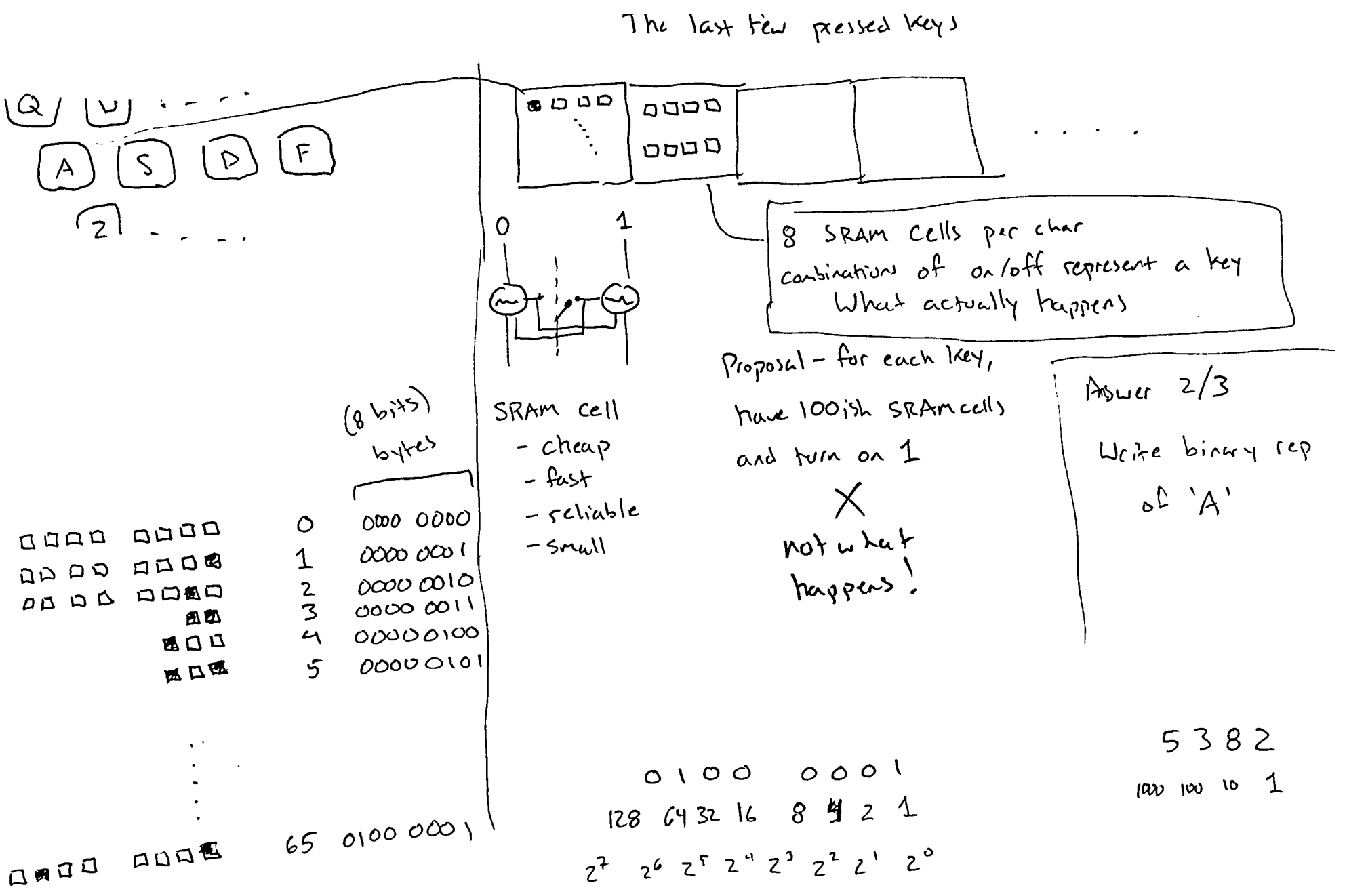
capital_a and sixty_five store the exact same data

ASCII Table

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

```c
#include <stdio.h>

void uppercase(char str[]) {









}

void inspect(char str[]) {
    for (int i = 0; str[i] != '\0'; i++) {
        char c = str[i];
        printf("(%c %d) ", c, c);
    }
    printf("\n");
}

int main() {
    char message[] = "Hello!";
    printf("%s\n", message);
    printf("(%c %d) (%c %d) (%c %d) (%c %d) (%c %d) (%c %d) (%c %d)\n",
           message[0], message[0],
           message[1], message[1],
           message[2], message[2],
           message[3], message[3],
           message[4], message[4],
           message[5], message[5],
           message[6], message[6]);
    inspect(message);

    // After this call, message should contain "HELLO!"
    uppercase(message);
    printf("After uppercase: %s\n", message);
}
```

```
$ gcc hello.c -o hello
$ ./hello
Hello!
(H 72) (e 101) (l 108) (l 108) (o 111) (! 33) ( 0)
(H 72) (e 101) (l 108) (l 108) (o 111) (! 33)
After uppercase: HELLO!
```


The last few pressed keys
Q W . . .
A S D F
Z . . .
0 1
8 SRAM cells per char
combinations of on/off represent a key
What actually happens
(8 bits)
bytes
SRAM cell
- cheap
- fast
- reliable
- small
Proposal - for each key,
have 100ish SRAM cells
and turn on 1
X
not what
happens!
Answer 2/3
Write binary rep
of 'A'
0 0000 0000
1 0000 0001
2 0000 0010
3 0000 0011
4 00000100
5 00000101
65 0100 0001
A
0100 0001
128 64 32 16 8 4 2 1
2^7 2^6 2^5 2^4 2^3 2^2 2^1 2^0
5382
1000 100 10 1

CSE29 - Systems Prog. and Software Tools

Joe Politz

https://ucsd-cse29.github.io/wi26

Joe's PL rec:
Racket racket-lang

Assignments
- Problem sets
- Projects
- Design questions

5 assignments

resubmission based on feedback for credit

Exams

TBD scheduling (testing center)

make-up in finals wk

Social Learning
- Lecture
- Discussion
- Labs

"high standards, multiple tries"