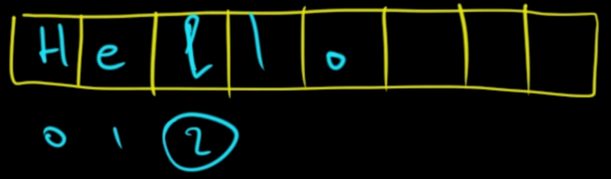
String - ref



String ≡ char[] (2 bytes)

UTF
- 1 byte
- 2 bytes
- 3 bytes
- 4 bytes

(1) Java's String Immutable

{

"Hello" + "1"

"Hello1"

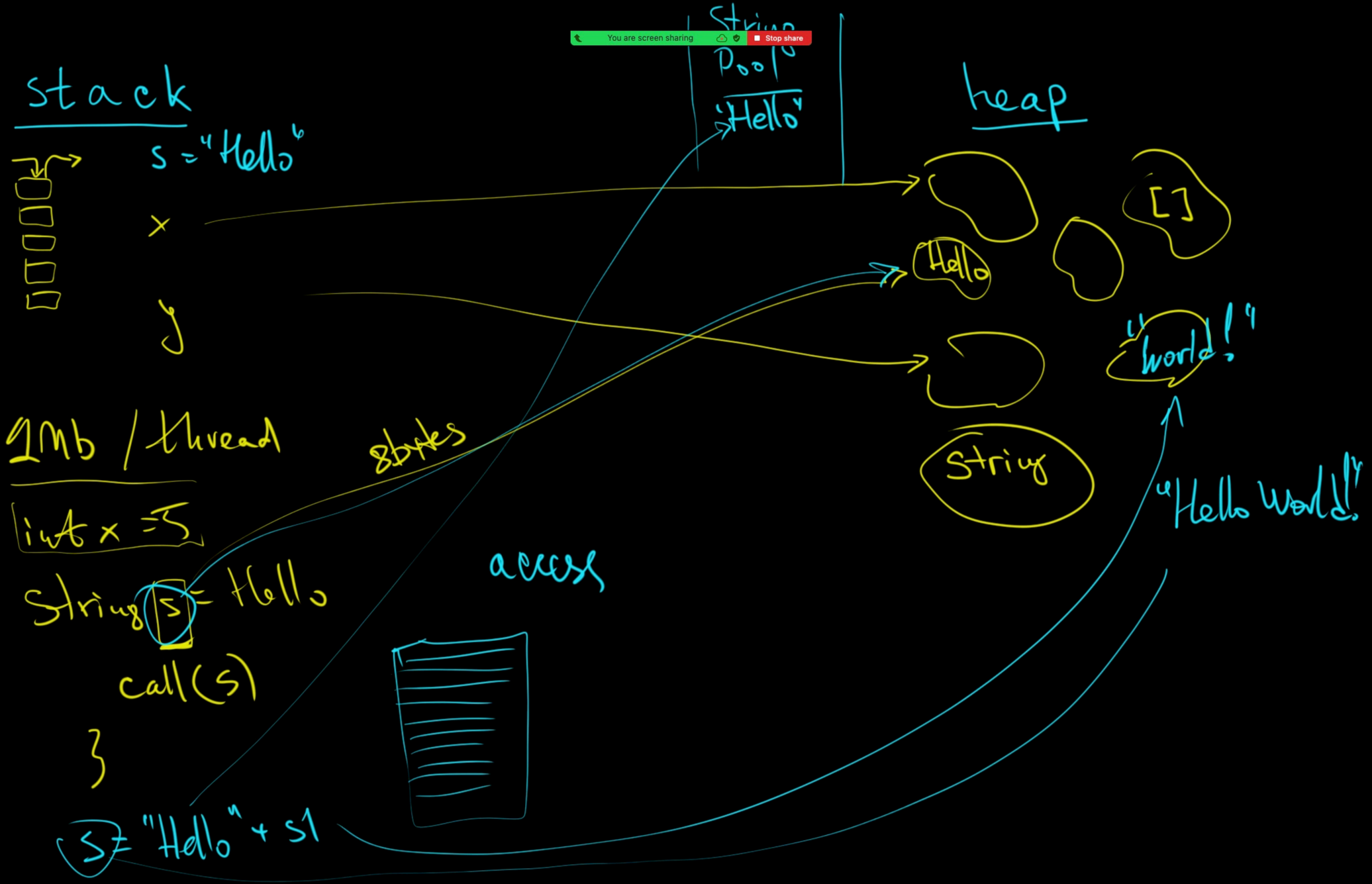
"el"

"Help"

}

int
+
-
*
/
%
>
<
==

String
.concat
.contains
.isEmpty
.substring
.replace
.charAt



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	@	@	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	80	50	120	P	P	112	70	160	p	p
17	11	021	DC1 (device control 1)	49	31	061	1	1	81	51	121	Q	Q	113	71	161	q	q
18	12	022	DC2 (device control 2)	50	32	062	2	2	82	52	122	R	R	114	72	162	r	r
19	13	023	DC3 (device control 3)	51	33	063	3	3	83	53	123	S	S	115	73	163	s	s
20	14	024	DC4 (device control 4)	52	34	064	4	4	84	54	124	T	T	116	74	164	t	t
21	15	025	NAK (negative acknowledge)	53	35	065	5	5	85	55	125	U	U	117	75	165	u	u
22	16	026	SYN (synchronous idle)	54	36	066	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	87	57	127	W	W	119	77	167	w	w
24	18	030	CAN (cancel)	56	38	070	8	8	88	58	130	X	X	120	78	170	x	x
25	19	031	EM (end of medium)	57	39	071	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	&#127;	DEL

ASCII

1 byte

2-bytes

И	1048	0418	CAPITAL LETTER I
Й	1049	0419	CAPITAL LETTER SHORT I
К	1050	041A	CAPITAL LETTER KA
Л	1051	041B	CAPITAL LETTER EL
М	1052	041C	CAPITAL LETTER EM

"नमस्ते"

3 bytes = 24 bits

6+6+4 = 16 bits

$2^{16} = 65536$

न म स ् त े

```
[[224, 164, 168], [224, 164, 174], [224, 164, 184], [224, 165, 141], [224, 164, 164], [224, 165, 135]]
[[E0, A4, A8], [E0, A4, AE], [E0, A4, B8], [E0, A5, 8D], [E0, A4, A4], [E0, A5, 87]]
[[11100000, 10100100, 10101000], [11100000, 10100100, 10101110], [11100000, 10100100, 10111000], [11100000, 10100101, 10001101],
```

2 byte = 16 bit

11 bits $2^{11} = 2048$

```
content:        `Привет`
length:         6
bytes length:   12
bytes per char: 2
bytes decimal:  [[208, 159], [209, 128], [208, 184], [208, 1
bytes hex:      [[D0, 9F], [D1, 80], [D0, B8], [D0, B2], [D0
bytes bin:      [[11010000, 10011111], [11010001, 10000000],
```

Symbol ≠ byte

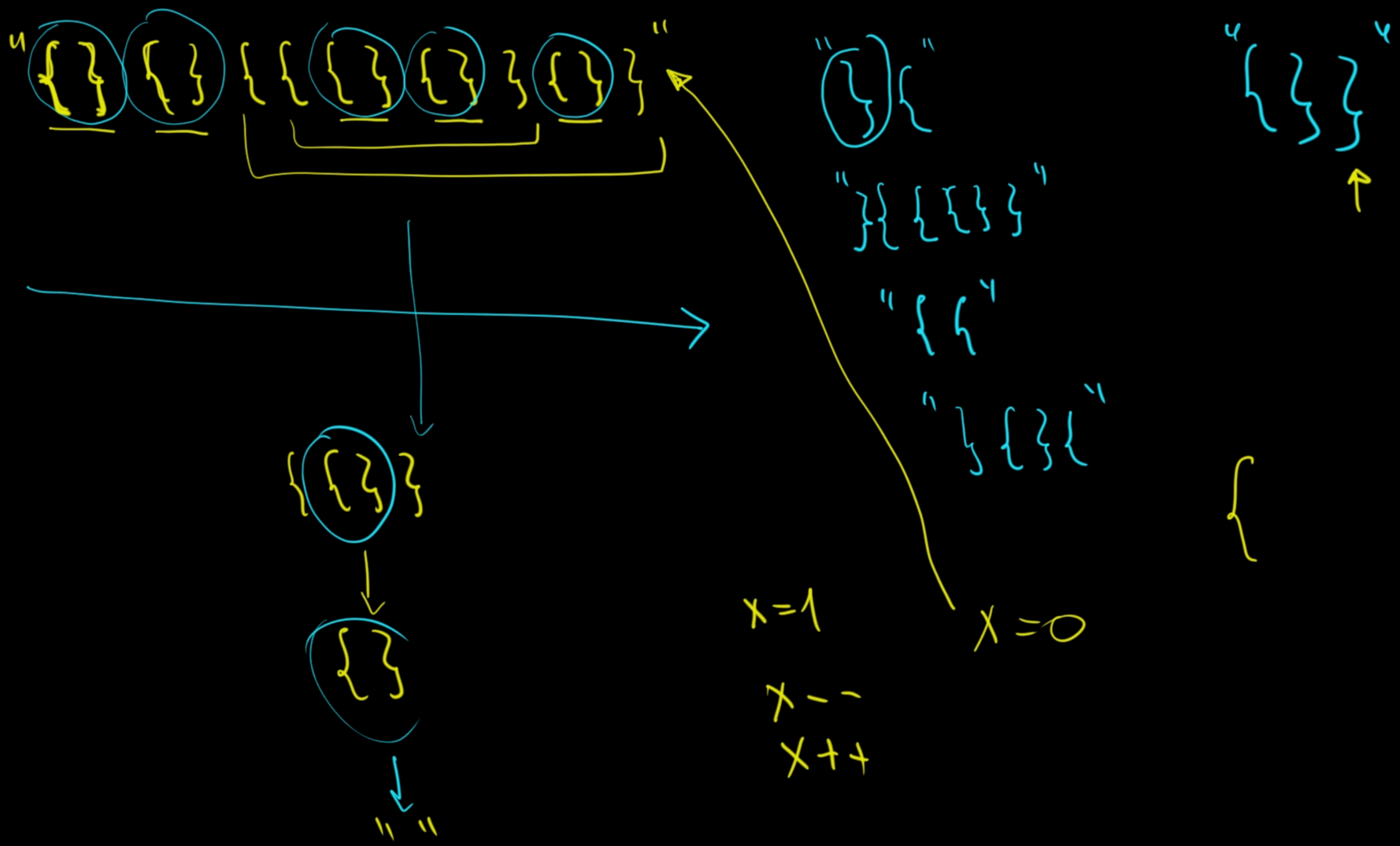
```
content:        `😀🤪😐🙄`
length:         8
bytes length:   16
bytes per char:4
bytes decimal: [[240, 159, 152, 128], [240, 159, 164, 170], [240, 159, 152, 144], [240, 159, 153, 1
bytes hex:     [[F0, 9F, 98, 80], [F0, 9F, A4, AA], [F0, 9F, 98, 90], [F0, 9F, 99, 84]]
bytes bin:     [[11110000, 10011111, 10011000, 10000000], [11110000, 10011111, 10100100, 10101010],
-----------------------------------------------------------
```

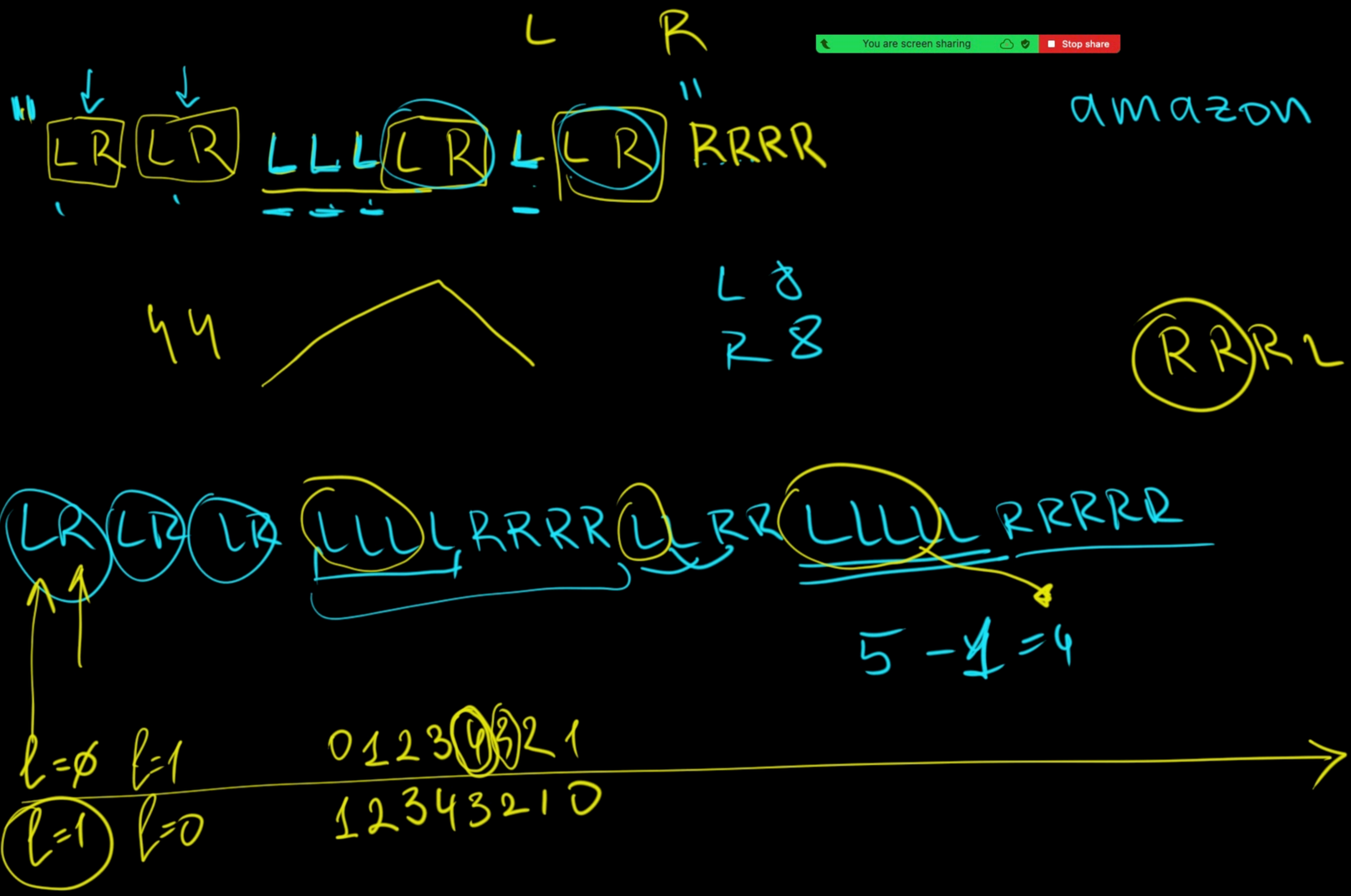
4 bytes = 32 bit

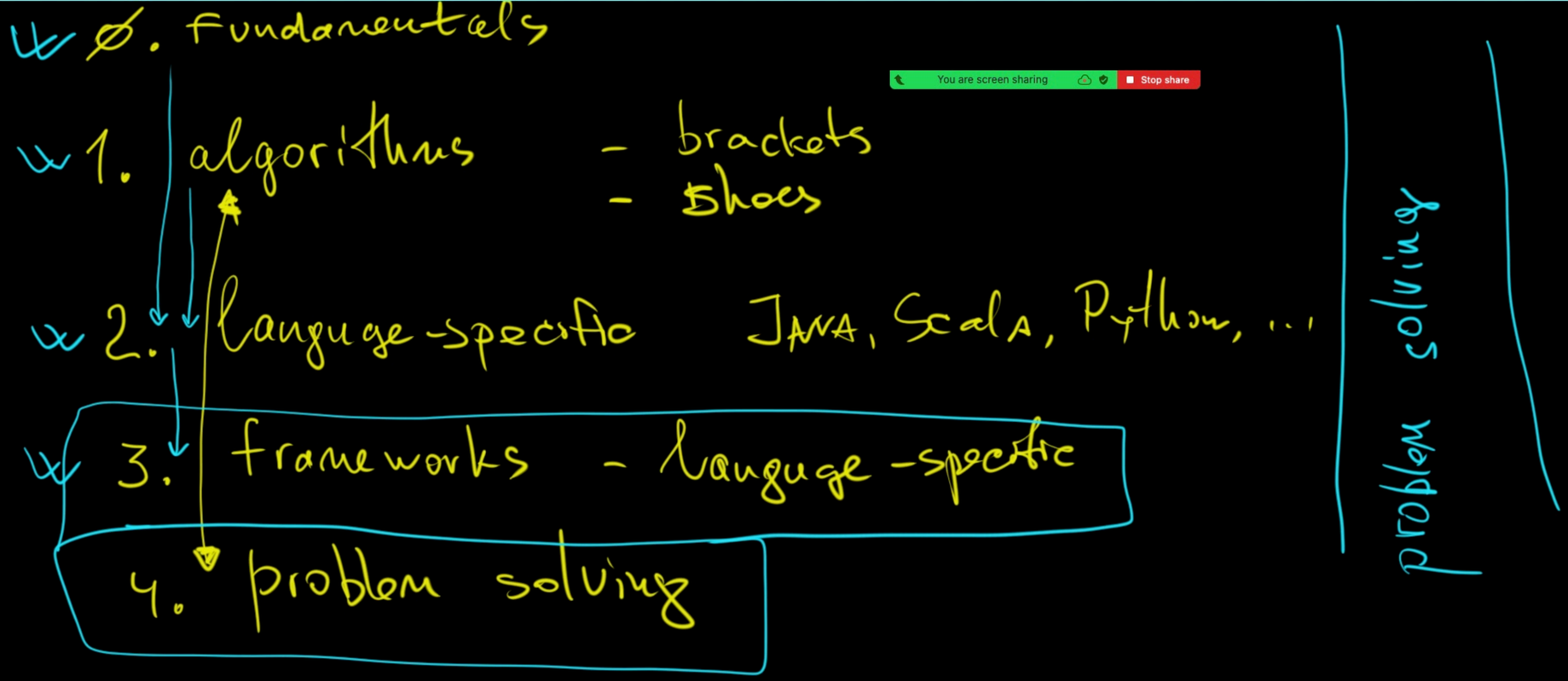
6+6+6+3 = 21 bit

$2^{24} = 16.xxx.xxx.$

$2^{21} = 2.xxx.xxx$

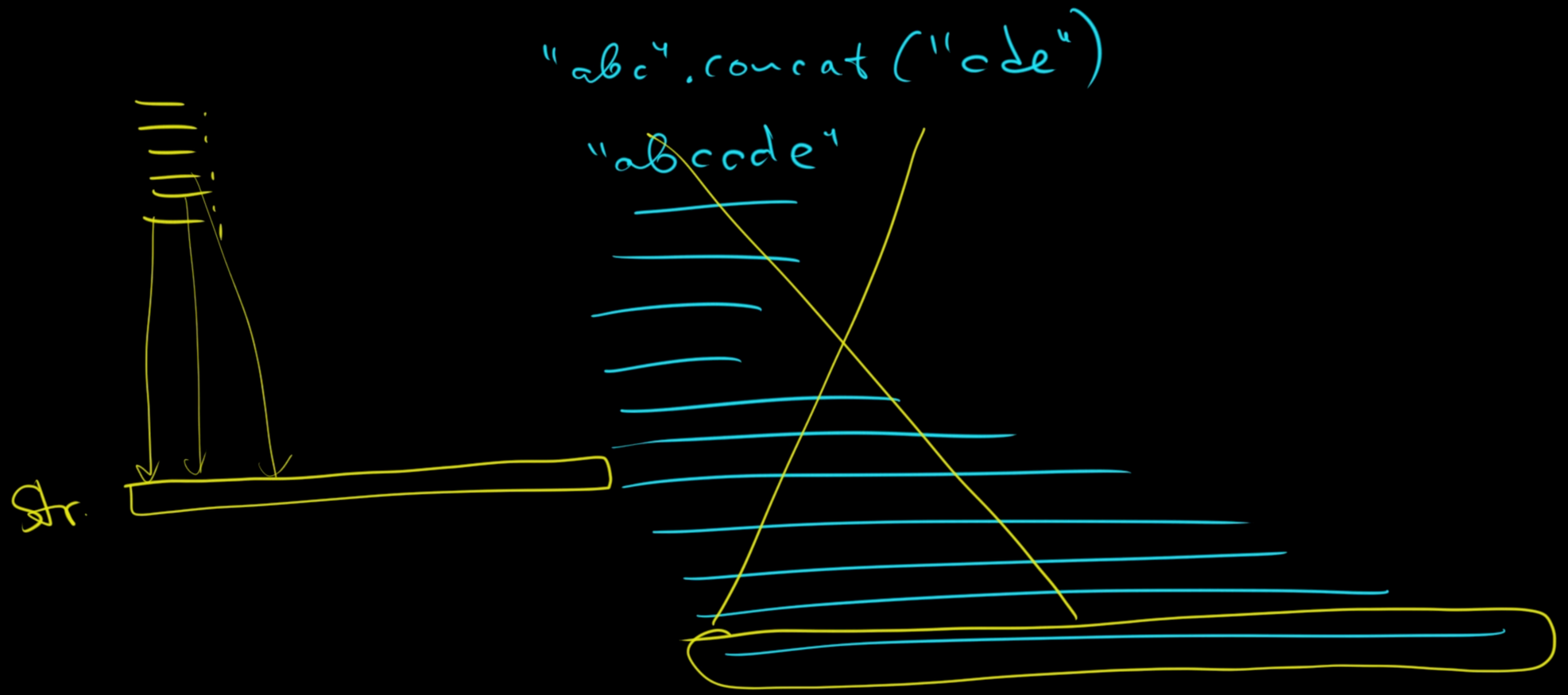



L R
You are screen sharing
Stop share
amazon
"LRLRLLLLRLRRRR"
int max = 0
int l = 0;
int r = 0;
for (char c: raw.toCharArray()) {
switch (c) {
case 'L':
if (r == 0) l++; else r--;
break;
case 'R':
if (l == 0) r++; else l--;
break;
default:
}
max = Math.max(max, Math.max(l, r));
L 8
R 8
RRRRL
LRLRLRLLLLRRRRLLRRLLLLLRRRRR
5 - 1 = 4
l=0 l=1 0123432 1
l=1 l=0 1234321 0


0. fundamentals
You are screen sharing
Stop share
1. algorithms - brackets
- shoes
2. language-specific JAVA, Scala, Python, ...
3. frameworks - language-specific
4. problem solving
problem solving

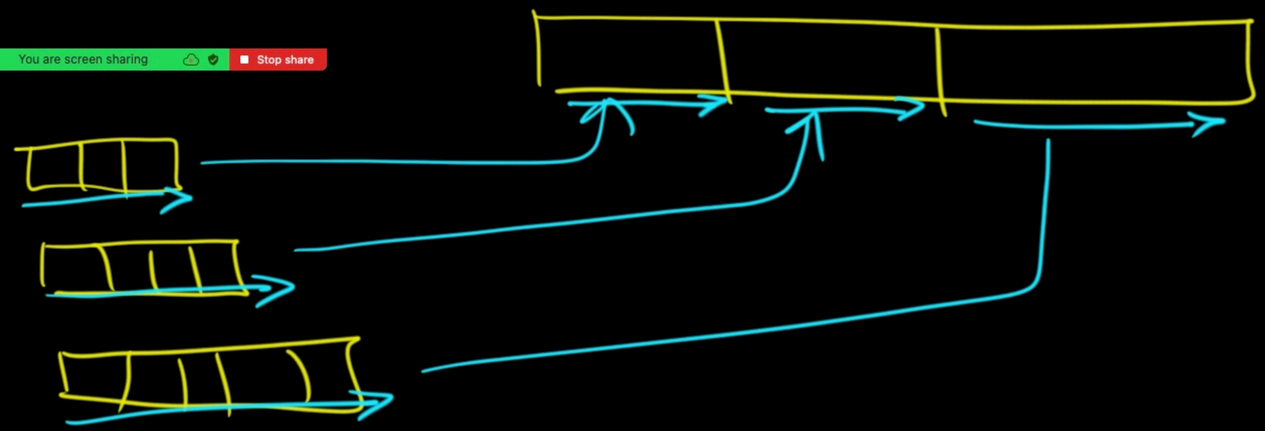
- hackerrank.com
- codility.com
- codewars.com
- google: online coding platform

string.concat



```java
int size = 0;
for (String x : xs) {
  size += x.length();
}
System.out.println(size);
char[] chars = new char[size];
int idx = 0;
for (String x : xs) {
  for(char c: x.toCharArray())
    chars[idx++] = c;
}
String outcome = new String(chars);
System.out.println(outcome);
```

size total



1. create String
2. locations: string pool, heap
3. operations
4. effective concatenation — StringBuilder, String.join
5. algorithmic tasks