number system
↳ decimal number → 10 → [0, 9]
↳ Binary number → 2 → [0, 1]
↳ octal number → 8 → [0, 7]

2	378	0
2	189	1
2	94	0
2	47	1
2	23	1
2	11	1
2	5	1
2	2	0
2	1	1
	0	

$0 \times 10^0 = 0$
$1 \times 10^1 = 10$
$0 \times 10^2 = 0$
$1 \times 10^3 = 1000$
$1 \times 10^4 = 10000$
$1 \times 10^5 = 100000$
$1 \times 10^6 = 1000000$
$0 \times 10^7 = 0$
$1 \times 10^8 = 100000000$

100000000
10000000
1000000
100000
10000
1000
10

101111010

101111010

mul = 1
sum = 0

```
while (n > 0) {
    rem = num % 2
    sum = sum + rem * mul
    n = n / 2
    mul = mul * 10
}
cout (sum)
```

des

	number	rem	src
→ 10	101111010	0	$0 \times 2^0 = 0$
10	10111101	1	$1 \times 2^1 = 2$
10	1011110	0	$0 \times 2^2 = 0$
10	101111	1	$1 \times 2^3 = 8$
10	10111	1	$1 \times 2^4 = 16$
10	1011	1	$1 \times 2^5 = 32$
10	101	1	$1 \times 2^6 = 64$
10	10	0	$0 \times 2^7 = 0$
10	1	1	$1 \times 2^8 = 256$
	0		

256
64
32
16
8
2
1
378

byte	→ 1 byte	→ 8 bit
short	→ 2 byte	→ 16 bit
int	→ 4 byte	→ 32 bit
Long	→ 8 byte	→ 64 bit
float	→ 4 byte	→ 32 bit
double	→ 8 byte	→ 64 bit

1 1 1 1 0 0 1 1 1

2^8 2^7 2^6 2^5 2^4 2^3 2^2 2^1 2^0

→ 128 — [0, 127]

256

[-128, 127]

2	39	- 1
2	19	- 1
2	9	- 1
2	4	- 0
2	2	- 0
2	1	- 1
	0	

10011

256 6

250