

# \* Reverse Bits

2's complement of  $\rightarrow 7$  to represent  $-7$

8 4 2 1  
0 1 1 1  $\rightarrow 7$

take 2's complement

add 1

1 0 0 0  
+  
1  
-----  
1 0 0 1  
value

to get the value easily,  
 $-8 + 1 = -7$

6 bit  
15 complement  
add  
take

39  
-25

64 32 16 8 4 2 1  
0 1 0 0 1 1 1  
- 0 0 1 1 0 0 1  
-----  
0 0 0 1 1 1 0

using 2's complement

39  
+ (-25)

0 1 0 0 1 1 1  
+ 1 1 0 0 1 1 1  
-----  
0 0 0 1 1 1 0

same

0011001  
1100110  
-----  
1100111

10100101000001111010011100

10

0001110010

0011100101110000010100101



Can use Integer.reverse()

0100100111011001

shift

result

No matter the value, 32 iterations  
shiftings.

• 1234 5678

1234 | 5678

5678 | 1234

7856 | 4321

8765 4321

00010111

01110001

11010000

11101000

①

Mask

00010101

11110000

00010000

00000001

00010111

00001111

00000111

01110000

01110001



② 01|1|00|01 cc 01|1|00|01  
 11 00 11 00 → 33  
 01 00 00 00 00 11 00 01

2 2  
 00 01 00 00 11 00 01 00  
 11 01 01 00

③ 11 01 01 00 11 01 01 00  
 10 10 10 10 → aa 01 01 01 01 → 55  
 10 00 00 00 01 01 01 00

1 1  
 01 00 00 00 10 10 10 00

0 00 10 11 → 11 10 10 00

0000 11  
 1111 7  
 a b c d e f

1110 1000

1010 1000

00 11 01 01 11 10 10 11 11 0

FFFFFFFFFFFFFFFF  
 1111111111111111  
 F f f f

No: \_\_\_\_\_

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

→ if we are taking (-) value, it remains.

①0101 ⇒ 10010 ⇒ it's like 12

↑  
sign bit

→ Shifts regardless of sign

①0101 ⇒ 01010

↑  
sign bit