

Topics to discuss

Convert decimal to binary:

$$(x)_{10} = (x)_2$$

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Decimal to binary conversion

eg:- $(38)_{10} = ?$

2	38	
2	19	0
2	9	1
2	4	1
2	2	0
	1	0

$$(38)_{10} = (100110)_2$$

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```

static long solution (int n) {
    long binary = 0;
    int rem;
    int pow = 1;
    while (n != 0) {
        rem = n % 2;
        n = n / 2;
        binary += rem * pow;
        pow *= 10;
    }
    return binary;
}

```

$binary = 0$, $pow = 1$
 let $n = 9$

① $rem = 9 \% 2 = 1$
 $n = 9 / 2 = 4.5 = 4$
 $binary = 0 + (1 \times 1) = 1$
 $pow = 1 \times 10 = 10$

② $rem = 4 \% 2 = 0$
 $n = 4 / 2 = 2$
 $binary = 1 + 0 \times 10 = 1$
 $pow = 10 \times 10 = 100$

③ $rem = 2 \% 2 = 0$
 $n = 2 / 2 = 1$
 $binary = 1 + 0 \times 100 = 1$
 $pow = 100 \times 10 = 1000$

④ $rem = 1 \% 2 = 1$
 $n = 1 / 2 = 0.5 = 0$
 $binary = 1 + 1 \times 1000 = 1 + 1000 = \boxed{1001}$
 $pow = 1000 \times 10 = 10000$

$T.C = O(\log n)$
 $S.C = O(1)$

Solution - 2

```
static String solution (int n) {  
    String binary = Integer.toBinaryString (n);  
    return binary;  
}
```

T.C = $O(1)$

S.C = $O(1)$

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