

# 190. Reverse Bits

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Reverse bits of a given 32 bits unsigned integer.

**Note:**

- Note that in some languages, such as Java, there is no unsigned integer type. In this case, both input and output will be given as a signed integer.
- In Java, the compiler represents the signed integers using [2's complement notation](#). Therefore, in **Example 2** above, the input represents

**Example 1:**

**Input:** n = 00000010100101000001111010011100  
**Output:** 964176192 (00111001011110000010100101000000)  
**Explanation:** The input binary string 00000010100101000001111010011100 represents the unsigned integer 4381. Its reverse is 00111001011110000010100101000000, which equals 964176192.

**Example 2:**

**Input:** n = 11111111111111111111111111111101  
**Output:** 3221225471 (10111111111111111111111111111111)  
**Explanation:** The input binary string 11111111111111111111111111111101 represents the unsigned integer 4294967295. Its reverse is 10111111111111111111111111111111, which equals 3221225471.

**Constraints:**

- The input must be a **binary string** of length 32

**Follow up:** If this function is called many times, how would you optimize it?

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Yes No

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