

Week 12(1):

ROLL NO.:240801194

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Your attempts

Attempt 2	
Status	Finished
Started	Monday, 13 January 2025, 6:03 AM
Completed	Monday, 13 January 2025, 6:13 AM
Duration	9 mins 24 secs
Review	

Attempt 1	
Status	Finished
Started	Sunday, 12 January 2025, 10:53 PM
Completed	Monday, 13 January 2025, 12:23 AM
Duration	1 hour 30 mins
Review	

Q1) A binary number is a combination of 1s and 0s. Its nth least significant digit is the nth digit starting from the right starting with 1. Given a decimal number, convert it to binary and determine the value of the the 4th least significant digit. Example number = 23

- Convert the decimal number 23 to binary number: $23_{10} = 2^4 + 2^2 + 2^1 + 2^0 = (10111)_2$.
- The value of the 4th index from the right in the binary representation is 0.

Function Description

Complete the function fourthBit in the editor below. fourthBit

has the following parameter(s):

int number: a decimal integer

Returns: int: an integer 0 or 1 matching the 4th least significant digit in the binary representation of number.

Constraints

$0 \leq \text{number} < 2^{31}$

Input Format for Custom Testing

Input from stdin will be processed as follows and passed to the function.

The only line contains an integer, number.

Sample Input

STDIN Function

32 → number = 32

Sample Output

0

Explanation

- Convert the decimal number 32 to binary number: $32_{10} = (100000)_2$.
- The value of the 4th index from the right in the binary representation is 0.

Code:

```
1  /*
2  * Complete the 'fourthBit' function below.
3  *
4  * The function is expected to return an INTEGER.
5  * The function accepts INTEGER number as parameter.
6  */
7
8  int fourthBit(int number)
9  {
10     int binary[32];
11     int i=0;
12     while(number>0)
13     {
14         binary[i]=number%2;
15         number/=2;
16         i++;
17     }
18     if(i>=4)
19     {
20         return binary[3];
21     }
22     else
23     return 0;
24 }
```

OUTPUT:

	Test	Expected	Got	
✓	printf("%d", fourthBit(32))	0	0	✓
✓	printf("%d", fourthBit(77))	1	1	✓

Passed all tests! ✓

Q2) Determine the factors of a number (i.e., all positive integer values that evenly divide into a number) and then return the pth element of the list, sorted ascending. If there is no pth element, return 0. Example $n = 20$ $p = 3$

The factors of 20 in ascending order are {1, 2, 4, 5, 10, 20}. Using 1-based indexing, if $p = 3$, then 4 is returned. If $p > 6$, 0 would be returned.

Function Description

Complete the function `pthFactor` in the editor below.

`pthFactor` has the following parameter(s): `int n`: the integer whose factors are to be found `int p`: the index of the factor to be returned

Returns:

`int`: the long integer value of the pth integer factor of `n` or, if there is no factor at that index, then 0 is returned

Constraints

$1 \leq n \leq 10^{15}$

$1 \leq p \leq 10^9$

Input Format for Custom Testing

Input from stdin will be processed as follows and passed to the function.

The first line contains an integer `n`, the number to factor.

The second line contains an integer `p`, the 1-based index of the factor to return.

Sample Input

STDIN Function

10 $\rightarrow n = 10$

3 $\rightarrow p = 3$

Sample Output

5

Explanation

Factoring $n = 10$ results in {1, 2, 5, 10}. Return the $p = 3$ rd factor, 5, as the answer.

Code:

```
1  /*
2  * Complete the 'pthFactor' function below.
3  *
4  * The function is expected to return a LONG_INTEGER.
5  * The function accepts following parameters:
6  * 1. LONG_INTEGER n
7  * 2. LONG_INTEGER p
8  */
9
10 long pthFactor(long n, long p)
11 {
12     int count =0;
13     for(long i=1;i<=n;++i)
14     {
15         if(n%i==0)
16         {
17             count++;
18             if(count==p)
19             {
20                 return i;
21             }
22         }
23     }
24     return 0;
25 }
```

OUTPUT:

	Test	Expected	Got	
✓	printf("%ld", pthFactor(10, 3))	5	5	✓
✓	printf("%ld", pthFactor(10, 5))	0	0	✓
✓	printf("%ld", pthFactor(1, 1))	1	1	✓

Passed all tests! ✓