

Week 12(1):

ROLL NO.:240801174

Name: Lavanya.S

Status	Finished
Started	Monday, 13 January 2025, 11:04 AM
Completed	Monday, 13 January 2025, 11:13 AM
Duration	9 mins 26 secs

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

$0 \leq \text{number} < 231$

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

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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 'myFunc' function below.  
3  *  
4  * The function is expected to return an INTEGER.  
5  * The function accepts INTEGER n as parameter.  
6  */  
7  
8 int myFunc(int n)  
9 {  
10     if(n==1)  
11     {  
12         return 1;  
13     }  
14     if(n%10==0)  
15     {  
16         if(myFunc(n/10))  
17         {  
18             return 1;  
19         }  
20     }  
21     if(n%20==0)  
22     {  
23         if(myFunc(n/20))  
24         {  
25             return 1;  
26         }  
27     }  
28     return 0;  
29 }  
30
```

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

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$10 \rightarrow n = 10$

$3 \rightarrow p = 3$

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 1/*
2  * Complete the 'powerSum' function below.
3  *
4  * The function is expected to return an INTEGER.
5  * The function accepts following parameters:
6  * 1. INTEGER x
7  * 2. INTEGER n
8  */
9
10 int powerSum(int x, int m, int n)
11 {
12     if(x==0)
13     {
14         return 1;
15     }
16     if(x<0)
17     {
18         return 0;
19     }
20     int count=0;
21     for(int i=m; ;i++)
22     {
23         int power=1;
24         for(int j=0;j<n;j++)
25         {
26             power*=i;
27         }
28         if(power>x)
29         {
30             break;
31         }
32         count+=powerSum(x/power,i+1,n);
33     }
34     return count;
35 }
```

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! ✓