

GE23131-Programming Using C-2024

Quiz navigation

[Show one page at a time](#)[Finish review](#)

Status	Finished
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Question **1**
Correct
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A binary number is a combination of 1s and 0s. Its n^{th} least significant digit is the n^{th} digit starting from the right starting with 1. Given a decimal number, convert it to binary and determine the value of the 4^{th} 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 4^{th} 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 0

STDIN Function

32 → number = 32

Sample Output 0

0

Explanation 0

- 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.

Sample Case 1**Sample Input 1**

STDIN Function

77 → number = 77

Sample Output 1

1

Explanation 1

- Convert the decimal number 77 to binary number: $77_{10} = (1001101)_2$.
- The value of the 4th index from the right in the binary representation is 1.

Answer: (penalty regime: 0 %)

Reset answer

```
1  /*
2  * Complete the 'fourthBit' function below.
3  *
4  * The function is expected to return an INTEGER.
```

```

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 }

```

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

Passed all tests!

Question 2

Correct

Marked out of 1.00

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Determine the factors of a number (i.e., all positive integer values that evenly divide into a number) and then return the p^{th} element of the list, sorted ascending. If there is no p^{th} 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

int: the long integer value of the p^{th} 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 Case 0**Sample Input 0**

STDIN	Function
-----	-----
10	→ $n = 10$
3	→ $p = 3$

Sample Output 0

5

Explanation 0

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

Sample Case 1**Sample Input 1**

STDIN	Function
-----	-----
10	→ $n = 10$
5	→ $p = 5$

0

Explanation 1

Factoring $n = 10$ results in $\{1, 2, 5, 10\}$. There are only 4 factors and $p = 5$, therefore 0 is returned as the answer.

Sample Case 2**Sample Input 2**

STDIN Function

1 → $n = 1$ 1 → $p = 1$ **Sample Output 2**

1

Explanation 2

Factoring $n = 1$ results in $\{1\}$. The $p = 1$ st factor of 1 is returned as the answer.

Answer: (penalty regime: 0 %)

Reset answer

```
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                 return i;
```

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```
23     return 0;  
24 }
```

	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!

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