

GE23131-Programming Using C-2024

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| Status | Finished |
| Started | Monday, 23 December 2024, 8:03 PM |
| Completed | Monday, 23 December 2024, 8:11 PM |
| Duration | 7 mins 40 secs |

Question 1

Correct

Marked out of 1.00

☐ Flag question

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 Case 0

Sample Input 0

STDIN Function

32 → number = 32

Sample Output 0

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

| | Test | Expected | Got | |
|--|--|----------|-----|--|
| | <code>printf("%d", fourthBit(32))</code> | 0 | 0 | |
| | <code>printf("%d", fourthBit(77))</code> | 1 | 1 | |

Passed all tests!

Question **2**

Correct

Marked out of 1.00

☐ Flag question

Determine the factors of a number (i.e., all positive integer values that evenly divide into a number) and return the p^{th} element of the list, sorted ascending. If there is no p^{th} element, return 0.

Example

$n = 20$

$p = 3$

$p > 6$, 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 p^{th} integer factor of `n` or, if there is no factor at that index, then 0 is

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` = 3rd factor, 5, as the answer.

Sample Case 1

Sample Input 1

STDIN Function

----- -----

10 → `n` = 10

5 → `p` = 5

Sample Output 1

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

| | Test | Expected | Got | |
|--|--|----------|-----|--|
| | <code>printf("%ld", pthFactor(10, 3))</code> | 5 | 5 | |
| | <code>printf("%ld", pthFactor(10, 5))</code> | 0 | 0 | |
| | <code>printf("%ld", pthFactor(1, 1))</code> | 1 | 1 | |

Passed all tests!

Save the state of the flags