

GE23131-Programming Using C-2024

Quiz navigation

1

2

Show one page at a time

Finish review

Status	Finished
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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. If you are 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

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- 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.
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 }
25

```

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

Passed all tests!

Question **2**
Correct

Determine the factors of a number (i.e., all positive integer values that evenly divide into a number). Return the factors sorted ascending. If there is no pth element, return 0.

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Flag question

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, the

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, th

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

REC-CIS

Sample Output 1

0

Explanation 1

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

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             {
20                 return i;
21             }
22         }
23     }
24     return 0;
25 }
```

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

REC-CIS

```
print( "%d", permAccor(1, 1))
```

Passed all tests!