

# Week-12-User-Defined Functions

GE23131-Programming Using C-2024

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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  $n^{\text{th}}$  least significant digit is the  $n^{\text{th}}$  digit starting from the right starting with 1. Given a decimal number, convert it to binary and determine the value of the  $4^{\text{th}}$  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  $4^{\text{th}}$  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

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

-----  
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 %)

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**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;
```

```
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

Flag question

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

Returns:  
`int`: the long integer value of the  $p^{\text{th}}$  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
```

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 as the answer.

Sample Case 2

Sample Input 2

```
STDIN      Function
-----
1   →  n = 1
1   →  p = 1
```

1

Explanation 2

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

Answer: (penalty regime: 0 %)

**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     if (n%1==0)
14     {
15         count++;
16         if(count==p)
17         {
18             return i;
19         }
20     }
21     return 0;
22 }
```

	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! ✓