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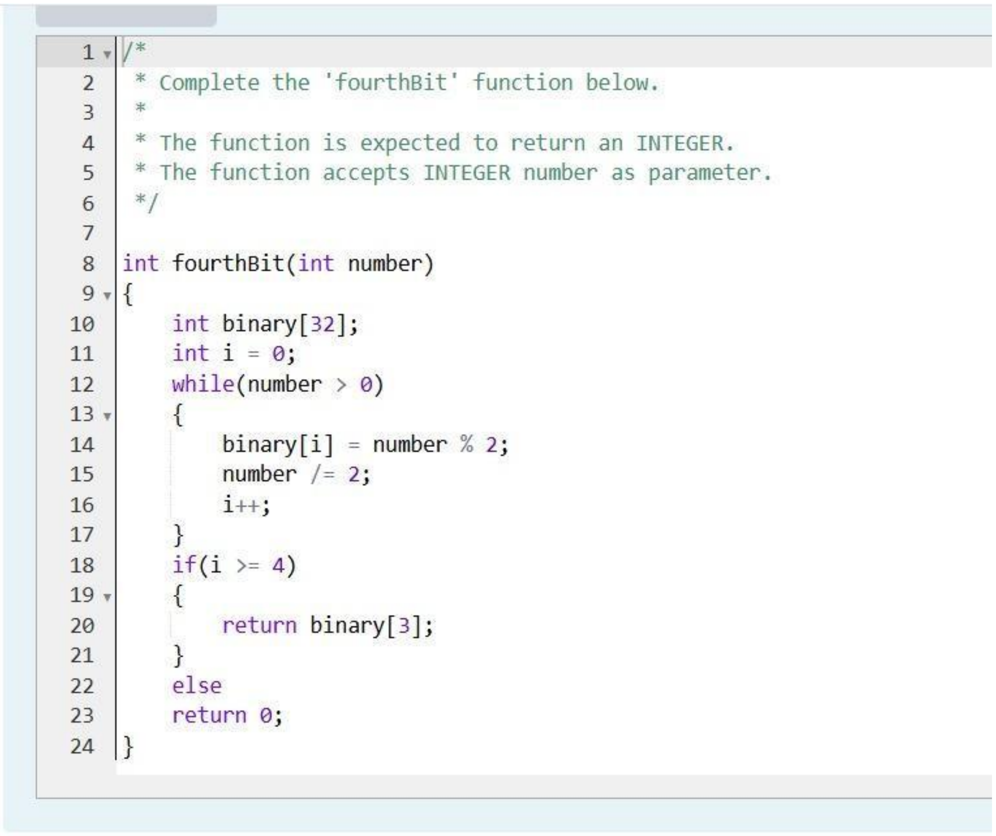
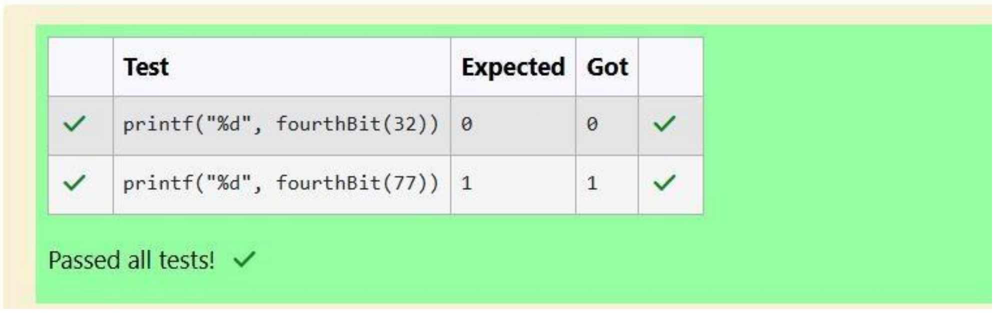
ECE-D

ProblemStatement:1
Abinarynumberisacombinationof1sand0s.Itsnthleastsignificantdigit is the nth digit
startingfromtherightstartingwith1.Givenadecimalnumber,convertitto binary and
determinethevalueofthethe4thleastsignificantdigit.
Example
number=23
• Convertthedecimalnumber23tobinarynumber:2310=24+22+21+ 20 = (10111)2.
• Thevalueofthe4thindexfromtherightinthebinaryrepresentationis0.
Function Description
CompletethefunctionfourthBitintheeditorbelow. fourthBit
has the following parameter(s):
intnumber:adecimalinteger
Returns:
int:aninteger0or1matchingthe4thleastsignificantdigitinthebinary representation of number.
Constraints
0≤number<231
InputFormatforCustomTesting
Inputfromstdinwillbeprocessedasfollowsandpassedtothefunction. The only line contains an integer, number.
Sample Input
STDINFunction
----- --------
32→number=32
Sample Output
0

Explanation
• Convertthedecimalnumber32tobinarynumber:3210=(100000)2.
• Thevalueofthe4thindexfromtherightinthebinaryrepresentationis0.



```c
/*
 * Complete the 'fourthBit' function below.
 *
 * The function is expected to return an INTEGER.
 * The function accepts INTEGER number as parameter.
 */

int fourthBit(int number)
{
    int binary[32];
    int i = 0;
    while(number > 0)
    {
        binary[i] = number % 2;
        number /= 2;
        i++;
    }
    if(i >= 4)
    {
        return binary[3];
    }
    else
    return 0;
}
```



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

Passed all tests! ✓

ProblemStatement:2
Determinethefactorsofanumber(i.e.,allpositiveintegervaluesthat evenly
divide into
anumber)andthenreturnthepthelementofthelist,sortedascending.If there is no
pth
element,return0.
Example
n = 20
p=3
Thefactorsof20inascendingorderare{1,2,4,5,10,20}.Using1-based indexing, if p
=
3,then4isreturned.Ifp>6,0wouldbereturned. Function
Description
CompletethefunctionpthFactorintheeditorbelow. pthFactor
has the following parameter(s):
intn:theintegerwhosefactorsaretobefound

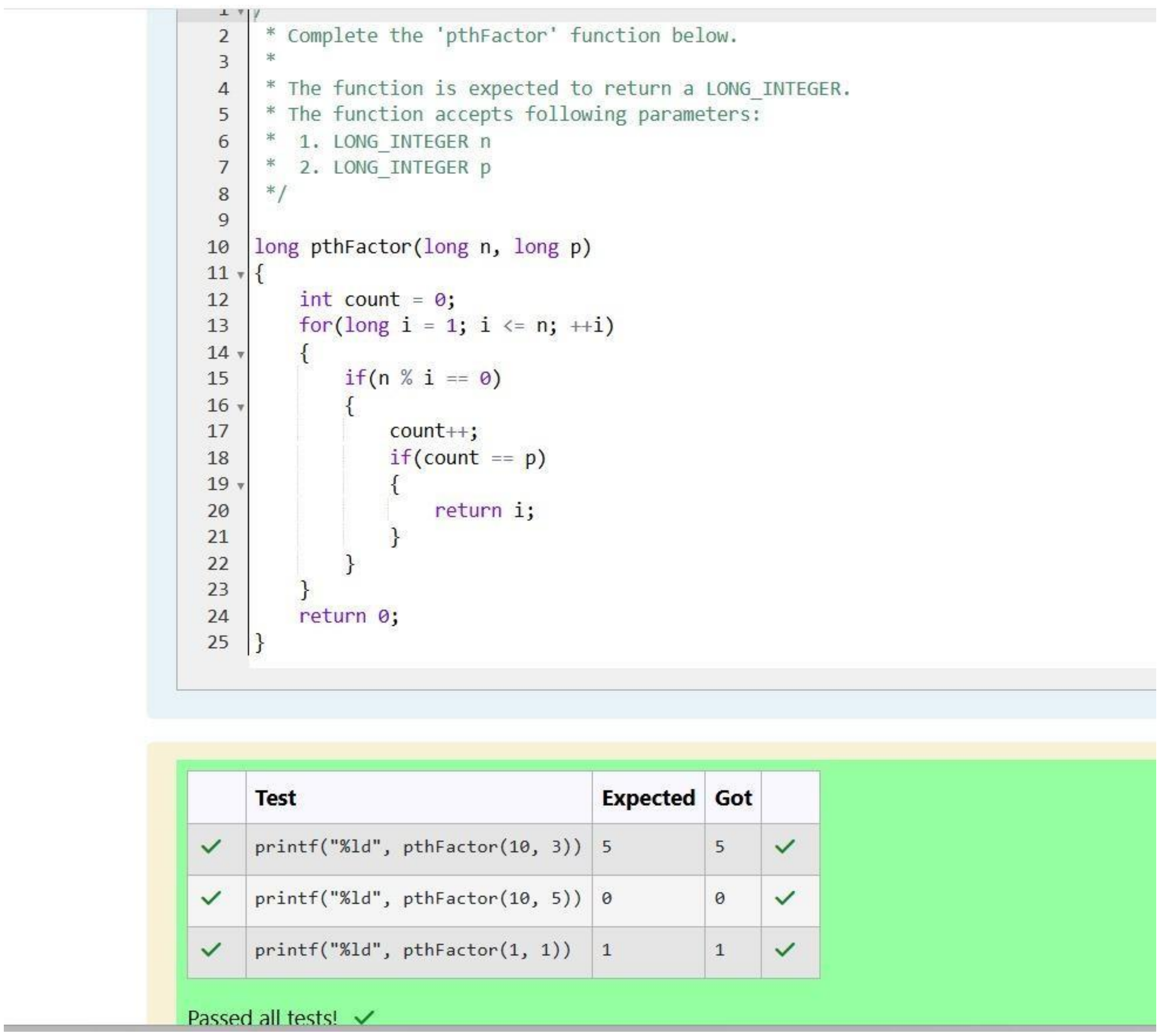
intp:theindexofthefactortobereturned
Returns:
int:thelongintegervalueofthepthintegerfactorofnor,ifthereisno factor at that index,then0isreturned
Constraints
1≤n≤1015
1≤p≤109
InputFormatforCustomTesting
Inputfromstdinwillbeprocessedasfollowsandpassedtothefunction. The first line contains an integer n, the number to factor.
Thesecondlinecontainsanintegerp,the1-basedindexofthefactorto return.
Sample Input

```
STDINFunction
----- --------
10→n=10
3 → p = 3
```

SampleOutput

```
5
```

Explanation
Factoringn=10resultsin{1,2,5,10}.Returnthep=3rdfactor,5,asthe answer.



```c
/*
 * Complete the 'pthFactor' function below.
 *
 * The function is expected to return a LONG_INTEGER.
 * The function accepts following parameters:
 *  1. LONG_INTEGER n
 *  2. LONG_INTEGER p
 */

long pthFactor(long n, long p)
{
    int count = 0;
    for(long i = 1; i <= n; ++i)
    {
        if(n % i == 0)
        {
            count++;
            if(count == p)
            {
                return i;
            }
        }
    }
    return 0;
}
```

	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! ✓

ProblemStatement:3
Youareabankaccounthacker.Initiallyyouhave1rupeeinyouraccount, and you want
exactlyNrupeesinyouraccount.Youwrotetwohacks,firsthackcan multiply the amount
ofmoneyyouownby10,whilethesecondcanmultiplyitby20.These hacks can be used
anynumberoftime.CanyouachievethedesiredamountNusingthese hacks.

Constraints:
1<=T<=100
1<=N<=10^12

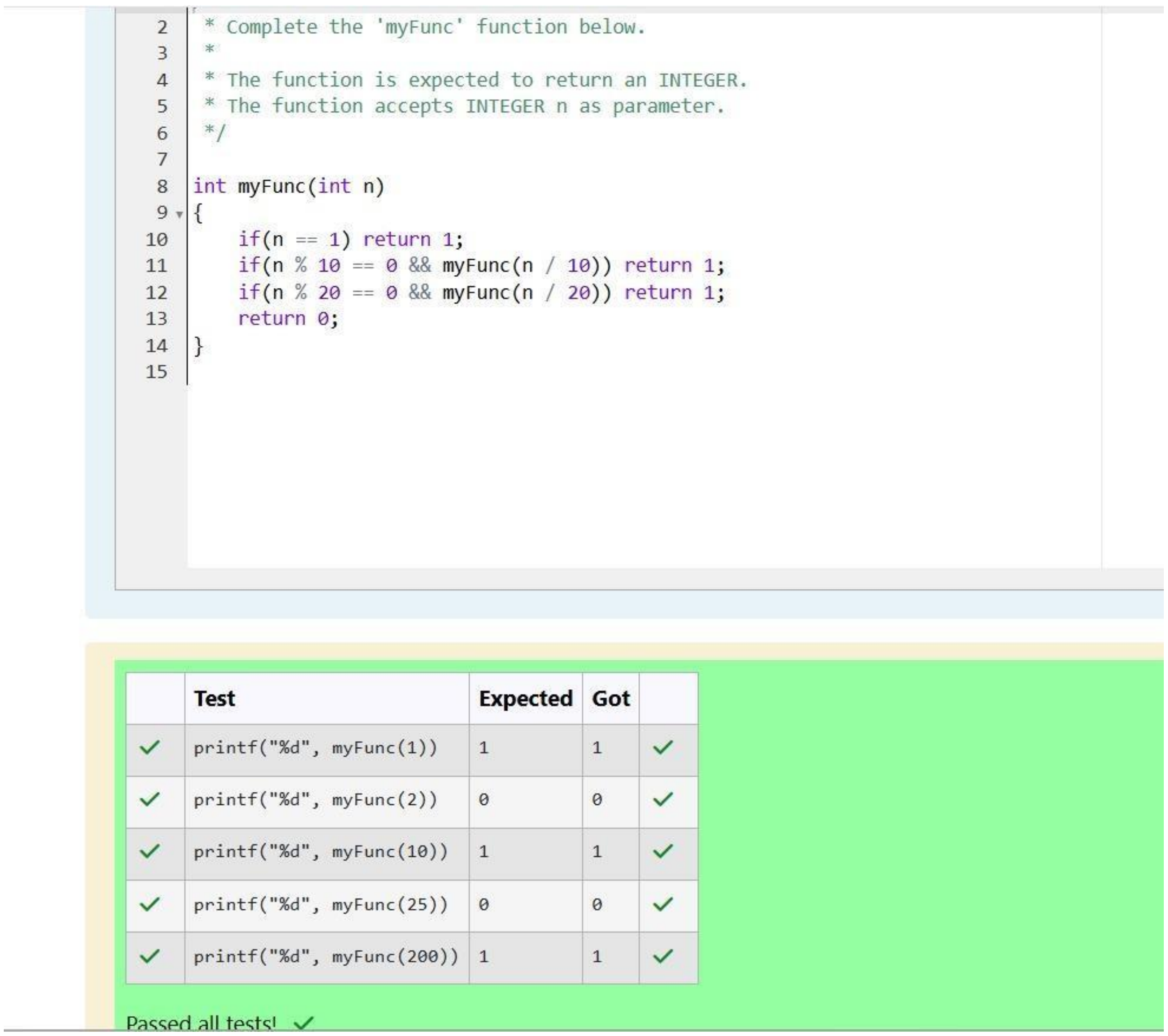
Input
• ThetestcasecontainsasingleintegerN.

Output
Foreachtestcase,printasinglelinecontainingthestring"1"ifyoucan make exactly N
rupeesor"0"otherwise. SAMPLE

INPUT

1
SAMPLEOUTPUT
1

SAMPLEINPUT
2
SAMPLEOUTPUT
0



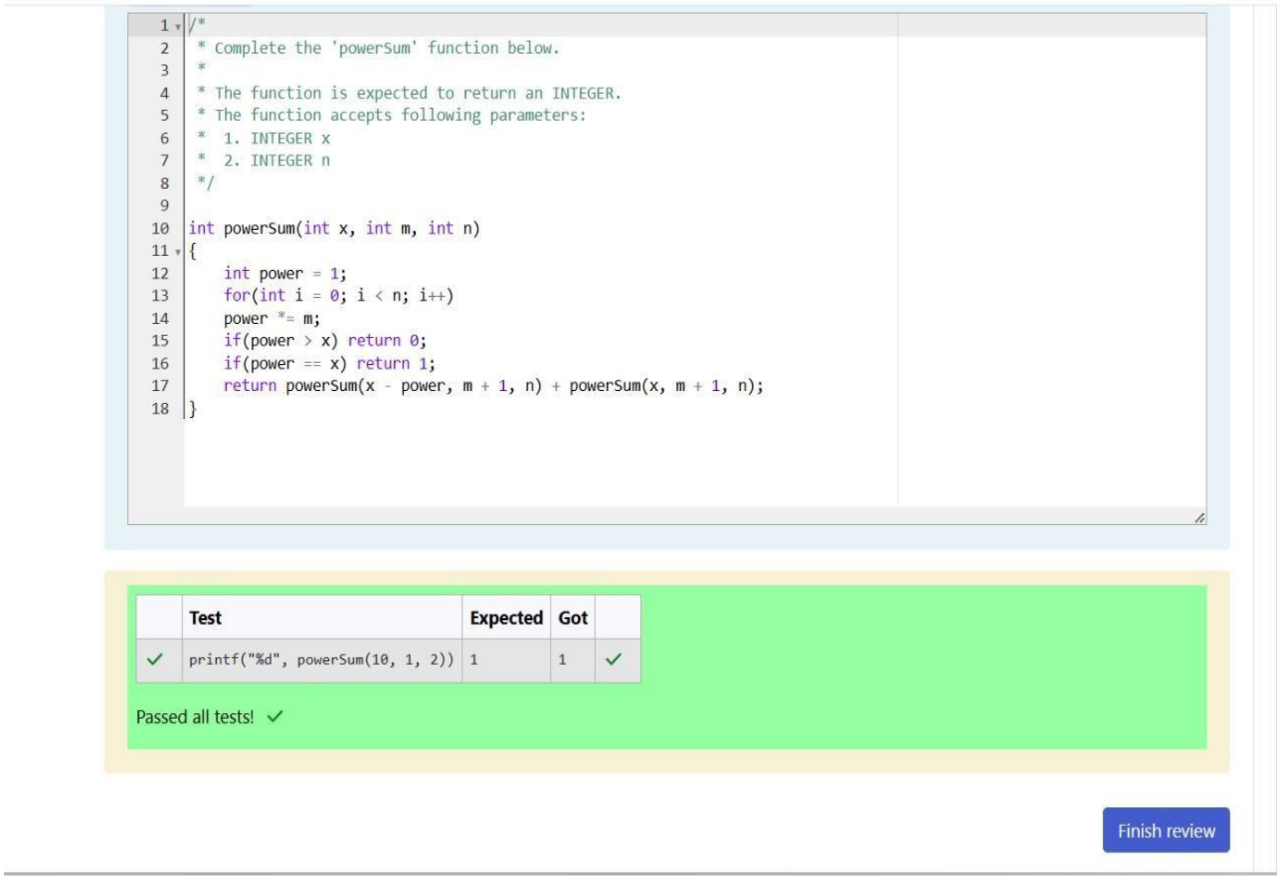
```
 * Complete the 'myFunc' function below.
 *
 * The function is expected to return an INTEGER.
 * The function accepts INTEGER n as parameter.
 */

int myFunc(int n)
{
    if(n == 1) return 1;
    if(n % 10 == 0 && myFunc(n / 10)) return 1;
    if(n % 20 == 0 && myFunc(n / 20)) return 1;
    return 0;
}

```

	Test	Expected	Got	
✓	`printf("%d", myFunc(1))`	1	1	✓
✓	`printf("%d", myFunc(2))`	0	0	✓
✓	`printf("%d", myFunc(10))`	1	1	✓
✓	`printf("%d", myFunc(25))`	0	0	✓
✓	`printf("%d", myFunc(200))`	1	1	✓

Passed all tests! ✓

ProblemStatement:4
Findthenumberofwaysthatagiveninteger,X,canbeexpressedasthe sum of the Nth
powersofunique,naturalnumbers.
Forexample,ifX=13andN=2,wehavetofindallcombinationsof unique squares adding
upto13.Theonlysolutionis22+32. Function
Description
CompletethepowerSumfunctionintheeditorbelow.Itshouldreturnan integer
thatrepresentsthenumberofpossiblecombinations.
powerSum has the following parameter(s):
X:theintegertosumto
N:theintegerpowertoraisenumbersto Input
Format
The first line contains an integer X.
ThesecondlinecontainsanintegerN.
Constraints
1≤X≤1000
2 ≤ N ≤ 10
OutputFormat
Outputasingleinteger,thenumberofpossiblecombinationscalculated. Sample
Input
10
2
SampleOutput
1
Explanation
IfX=10andN=2,weneedtofindthenumberofwaysthat10canbe represented as the
sumofsquaresofuniquenumbers. 10 =
12 + 32

Thisistheonlywayinwhich10canbeexpressedasthesumofunique squares.



```
/*
 * Complete the 'powerSum' function below.
 *
 * The function is expected to return an INTEGER.
 * The function accepts following parameters:
 *  1. INTEGER x
 *  2. INTEGER n
 */

int powerSum(int x, int m, int n)
{
    int power = 1;
    for(int i = 0; i < n; i++)
    power *= m;
    if(power > x) return 0;
    if(power == x) return 1;
    return powerSum(x - power, m + 1, n) + powerSum(x, m + 1, n);
}
```

	Test	Expected	Got	
✓	printf("%d", powerSum(10, 1, 2))	1	1	✓

Passed all tests! ✓