

04 - Iteration Control Structures

Ex. No:4.1

Date: 13.04.24

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Nth Fibonacci

Write a [program](#) to return the nth number in the fibonacci series. The value of N will be passed to the [program](#) as input.

NOTE: Fibonacci series looks like –

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, . . . and so on.

i.e. Fibonacci series starts with 0 and 1, and continues generating the next number as the sum of the previous two numbers.

- first Fibonacci number is 0,
- second Fibonacci number is 1,
- third Fibonacci number is 1,
- fourth Fibonacci number is 2,
- fifth Fibonacci number is 3,
- sixth Fibonacci number is 5,
- seventh Fibonacci number is 8, and so on.

For example:

Input	Result
1	0
4	2
7	8

Program:

```
a=int(input())
b=0
c=1
if(a==1):
    print("0")
elif(a==2):
    print("1")
else:
    for i in range (3,a+1):
        d=b+c
        b=c
        c=d
    print(d)
```

	Input	Expected	Got	
✓	1	0	0	✓
✓	4	2	2	✓
✓	7	8	8	✓

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Factors of a number

Determine the factors of a number (i.e., all positive integer values that evenly divide into a number).

For example:

Input	Result	
20	1 2 4 5 10 20	

Program:

```

a=int(input())
for i in range(1,a+1):
    if(a%i==0):
        print(i,end=" ")

```

	Input	Expected	Got	
✓	20	1 2 4 5 10 20	1 2 4 5 10 20	✓
✓	5	1 5	1 5	✓
✓	13	1 13	1 13	✓

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Product of single digit

Given a positive integer N, check whether it can be represented as a product of single digit numbers.

Input Format:

Single Integer input.

Output Format:

Output displays Yes if condition satisfies else prints No.

Example Input:

14

Output:

Yes

Example Input:

13

Output:

No

Program:

```
a=int(input())
```

```
c=0
```

```
for i in range(1,10): for j in range(1,10):
```

```
if i*j==a:
```

```
c=1
```

```
if(c==1):
```

```
print("Yes")
```

```
▼ else:
```

```
print("No")
```

	Input	Expected	Got	
✓	14	Yes	Yes	✓
✓	13	No	No	✓

Ex. No: 4.4

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Unique Digit Count

Write a program to find the count of unique digits in a given number N. The number will be passed to the program as an input of type int.

Assumption: The input number will be a positive integer number ≥ 1 and ≤ 25000 . For e.g.

If the given number is 292, the program should return 2 because there are only 2 unique digits '2' and '9' in this number

If the given number is 1015, the program should return 3 because there are 3 unique digits in this number, '1', '0', and '5'.

For example:

Input	Result
292	2
1015	3

Program:

```
a=input()
```

```
b=len(set(a))
```

```
print(b)
```

	Input	Expected	Got	
✓	292	2	2	✓
✓	1015	3	3	✓
✓	123	3	3	✓

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Non Repeated Digit Count

Write a program to find the count of non-repeated digits in a given number N. The number will be passed to the program as an input of type int.

Assumption: The input number will be a positive integer number ≥ 1 and ≤ 25000 . Some examples are as below.

If the given number is 292, the program should return 1 because there is only 1 non-repeated digit '9' in this number

If the given number is 1015, the program should return 2 because there are 2 non-repeated digits in this number, '0', and '5'.

If the given number is 108, the program should return 3 because there are 3 non-repeated digits in this number, '1', '0', and '8'.

If the given number is 22, the function should return 0 because there are NO non-repeated digits in this number.

Input	Result
292	1
1015	2
108	3
22	0

For example:

Program:

```
a={}
```

```
for i in input:
```

```
    if i in a:a[i]+=1
```

```
    else:a[i]=1
```

```
print(sum([1 for i in a if a[i]==1]))
```

	Input	Expected	Got	
✓	292	1	1	✓
✓	1015	2	2	✓
✓	108	3	3	✓
✓	22	0	0	✓

Ex. No: 4.6

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Next Perfect Square

Given a number N, find the next perfect square greater than N.

Input Format:

Integer input from stdin.

Output Format:

Perfect square greater than N.

Example Input:

10

Output:

16

Program:

```
import math
a=int(input())
```

```

b = a + 1
while b > 0 :
    m=math.sqrt(b)
    if(m==int(m)):
        print(b)
        break
    else:
        b = b + 1

```

	Input	Expected	Got	
✓	10	16	16	✓

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Sum of Series

Write a program to find the sum of the series $1 + 11 + 111 + 1111 + \dots + n$ terms (n will be given as input from the user and sum will be the output)

Sample Test Cases

Test Case 1

Input

4

Output

1234

Explanation:

as input is 4, have to take 4 terms.

$1 + 11 + 111 + 1111$

Test Case 2

Input

6

Output

123456

For example:

Input	Result
3	123

Program:

```
a=int(input())
```

```
t=1
```

```
s=0
```

```
for i in range(a)
```

```
    s+=t
```

```
    t=t*10+1
```

```
print(s)
```

	Input	Expected	Got	
✓	4	1234	1234	✓
✓	6	123456	123456	✓

Ex. No: 4.8

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Prime Checking

Write a program that finds whether the given number N is Prime or not. If the number is prime, the program should return 2 else it must return 1.

Assumption: $2 \leq N \leq 5000$, where N is the given number.

Example1: if the given number N is 7, the method must return 2

Example2: if the given number N is 10, the method must return 1

For example:

Input	Result
7	2
10	1

Program:

```

a=int(input())
c=0
for i in range(2,a):
    if(a%i==0):
        c=1
    if(c==1):
        print("1")
    elif(c==0): print("2")

```

	Input	Expected	Got	
✓	7	2	2	✓
✓	10	1	1	✓

Ex. No: 4.9

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Disarium Number

A Number is said to be Disarium number when the sum of its digit raised to the power of their respective positions becomes equal to the number itself. Write a [program](#) to print number is Disarium or not.

Input Format:

Single Integer Input from stdin.

Output Format:

Yes or No.

Example Input:

175

Output:

Yes

Explanation

$$1^1 + 7^2 + 5^3 = 175$$

Example Input:

123

Output:

No

For example:

Input	Result
175	Yes
123	No

Program:

```
a=input()
n=len(a)
r=0
for i,d in enumerate(a):
    r+=int(d)**(i+1)
    if r==int(a):
        print("Yes")
    else:
        print("No")
```

	Input	Expected	Got	
✓	175	Yes	Yes	✓
✓	123	No	No	✓

Ex. No: 4.10

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Perfect Square After adding One

Given an integer N, check whether N the given number can be made a perfect square after adding 1 to it.

Input Format:

Single integer input.

Output Format:

Yes or No.

Example Input:

24

Output:

Yes

Example Input:

26

Output:

No

For example:

Input	Result
24	Yes

Program:

```
import math
a=int(input())
b=a+1
c=math.sqrt(b)
if(c==int(c)):
    print("Yes")
else:
```

```
print("No")
```

	Input	Expected	Got	
✓	24	Yes	Yes	✓
✓	26	No	No	✓