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 4 7	0 2 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)
```

Ex. No. : 4.2 **Date: 13.04.24**

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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=" ")
```

Ex. No. : 4.3 **Date: 13.04.24**

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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")
```

Ex. No. : 4.4 **Date: 13.04.24**

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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)
```

Ex. No. : 4.5 **Date: 13.04.24**

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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.

For example:

Input	Result
292	1
1015	2
108	3
22	0

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]))
```

Ex. No. : 4.6 **Date: 13.04.24**

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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
```

Ex. No. : 4.7 **Date: 13.04.24**

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Sum of Series

Write a program to find the sum of the series 1 +11 + 111 + 1111 + . . . + 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)
```

Ex. No. : 4.8 **Date: 13.04.24**

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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 <= N <=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”)
```

Ex. No. : 4.9 **Date: 13.04.24**

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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")
```

Ex. No. : 4.10 **Date: 13.04.24**

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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")
```