

## 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	✓

Ex. No. : 4.2

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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	✓

Ex. No. : 4.3

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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  $\geq 1$  and  $\leq 25000$ . 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	✓

Ex. No. : 4.5

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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  $\geq 1$  and  $\leq 25000$ . 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]))
```

	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	✓



Ex. No. : 4.7

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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:

InputResult

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	✓