

WEEK - 4

Iteration Controls

1) 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)

Input: 4

Output: 1234

Explanation: As input is 4, We have to take 4 terms. $1 + 11 + 111 + 1111$

Input	Result
3	123

PROGRAM :

```
a=int(input())
s=0
for i in range(1,a+1):
    s+=int(('1'*i))
print(s)
```

2) Write a program to find the count of ALL 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 .

Input	Result
293	3

```
a=int(input())
c=0
while(a!=0):
```

```
a//=10
```

```
c+=1
```

```
print(c)
```

3) A number is stable if each digit occur the same number of times.i.e, the frequency of each digit in the number is the same. For e.g. 2277,4004,11,23,583835,1010 are examples for stable numbers. Similarly, a number is unstable if the frequency of each digit in the number is NOT same.

Input	Result
2277	Stable Number

PROGRAM :

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

```
c=0
```

```
for i in a:
```

```
    for j in a:
```

```
        if i==j:
```

```
            c+=1
```

```
if c%4==0:
```

```
    print("Stable Number")
```

```
else:
```

```
    print("Unstable Number")
```

4) Write a program that reads a positive integer, n, from the user and then displays the sum of all of the integers from 1 to n.

Input	Result
10	The sum of the first 10 positive integers is 55.0

PROGRAM :

```
n=int(input())
m=(n*(n+1)/2)
print("The sum of first “n,”positive integers is %.1f"%(m))
```

5) 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.

Input	Result
8	13

PROGRAM :

```
a=int(input())
s=0
if a==0:
    print(0)
elif a==1:
    print(1)
else:
    x,y=0,1
    for i in range(2,a):
        x,y=y,x+y
    print(y)
```

6) 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)

Input: 4

Output: 1234

Explanation: as input is 4, have to take 4 terms. $1 + 11 + 111 + 1111$

Input	Result
3	123

PROGRAM :

```
a=int(input())
s=0
for i in range(1,a+1):
    s+=int(('1'*i))
print(s)
```

7) Strong number is a special number whose sum of factorial of digits is equal to the original number.

For example: 145 is strong number. Since, $1! + 4! + 5! = 145$.

Write a program to find whether the given number is a Strong Number or not.

Input	Result
145	Yes

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

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=' ')
```

9) You are choreographing a circus show with various animals. For one act, you are given two kangaroos on a number line ready to jump in the positive direction.

- The first kangaroo starts at position x_1 and moves at a speed v_1 meters per jump.
- The second kangaroo starts at position x_2 and moves at a speed of v_2 meters per jump and $x_2 > x_1$
- You have to figure out how to get both kangaroos at the same position at the same time as part of the show before k jumps. If it is possible, return YES, otherwise return NO.

Input Format:

x_1 -position of kangaroo1

v_1 -Speed of kangaroo1

x_2 -position of kangaroo2

v_2 -Speed of kangaroo2

k -jumps

Output Format:

Both kangaroos are at the same position within k jumps, YES, otherwise NO.

Input	Result
0 3 4 2 6	YES

PROGRAM :

```
X1 = int(input())
```

```
V1 =int(input())
```

```

X2 =int(input())
V2 = int(input())
K=int(input())
i=1,s=0
while(i<K):
    X1+=V1
    X2+=V2
    If(X1==X2):
        s=1
        break
    i+=1
if(s==1):
    print("YES")
else:
    print("NO")

```

10) Write a program to check whether a given number is a perfect number or not.

Perfect number is a positive number whose sum of all positive divisors excluding that number is equal to that number.

For example, 6 is the perfect number since divisors of 6 are 1, 2 and 3.

Sum of its divisor is $1 + 2 + 3 = 6$

Input	Result
6	YES

PROGRAM :

```

a=int(input())
t=a
s=0
while(a!=0):
    b=a%10

```

```
c=1
for i in range(1,b+1):
    c*=i
s+=c
a//=10
if(t==s):
    print("Yes")
else:
    print("No")
```