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### loop operation

① Write a program to check armstrong number.

Ans:- i)  $n = 1634$

$s = n$

$b = \text{len}(\text{str}(n))$

$\text{sum}1 = 0$

while  $n \neq 0$ :

$r = n \% 10$

$\text{sum}1 = \text{sum}1 + (r^{**}b)$

$n = n // 10$

if  $s == \text{sum}1$ :

print("The given no. ",  $s$ , " is armstrong number")

else:

print("The given number",  $s$ , " is not a armstrong no")

ii)  $n = 150$

$s = n$

$b = \text{len}(\text{str}(n))$

$\text{sum}1 = 0$

while  $n \neq 0$ :

$r = n \% 10$

$\text{sum}1 = \text{sum}1 + (r^{**}b)$

$n = n // 10$

if  $s == \text{sum}1$ :

print("The given no. ",  $s$ , " is armstrong no.")

print

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```
print("The given number '5', is not a armstrong no.)
```

② Print fibonacci series upto  $n$  terms where  $n$  is user define.

Ans:- num=5

$n_1, n_2 = 0, 1$

```
print("Fibonacci series:", n1, n2, end = " ")
```

```
for i in range (2, num):
```

```
    n3 = n1 + n2
```

```
    n1 = n2
```

```
    n2 = n3
```

```
    print(n3, end = " ")
```

```
print()
```

③ Check the number is palindrome or not

Ans:-  $n = \text{int}(\text{input}(\text{"Enter number"}))$

temp =  $n$ .

rev = 0

while ( $n > 0$ ):

dig =  $n \% 10$

rev =  $\text{rev} * 10 + \text{dig}$

$n = n // 10$

if (temp == <sup>rev</sup>rev):

```
    print("The number is a palindrome")
```

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```
    print("The number isn't a palindrome")
```

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Q) Write a program for insertion sort using python.

```
Ans:- def insertion sort (arr):  
    if (n:=len(arr)) <= 1:  
        return.  
    for i in range (1,n):  
        key = arr[i].  
        j = i-1  
        while j >= 0 and key < arr[j]:  
            arr[j+1] = arr[j]  
            j -= 1  
        arr[j+1] = key  
arr = [18, 9, 20, 7, 10]  
insertion sort(arr)  
print(arr)
```



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### Functions

Q1) Find the factorial of a number using function.

Ans:- `def factorial(num):`

`if (num == 0):`

`return 1`

`else :`

`return num * factorial(num-1)`

`num = int(input("Enter a number"))`

`if num < 0:`

`print("Factorial cannot be found for negative numbers")`

`elif num == 0:`

`print("Factorial of 0 is 1")`

`else:`

`print("Factorial of,"num," is ", factorial(num)).`

Q2) Perform bubble sort using function.

Ans:-



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```
def bubble_sort(nums):
```

```
    n = len(nums)
```

```
    for i in range(n)
```

```
        for j in range(0, n-i-1):
```

```
            if nums[j] > nums[j+1]:
```

```
                nums[j], nums[j+1] = nums[j+1], nums[j]
```

```
nums = [64, 34, 25, 12, 22, 11, 90]
```

```
bubble_sort(nums)
```

```
print("Sorted list in ascending order:", nums)
```

✓  
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