

16/9/2025 (Day -10)

* Swap logic: In Python, swap logic means exchanging the values of two variables.

- These are different ways

- Pythonic way (tuple unpacking)

a = 10

b = 10

a, b = b, a

- using a Temporary variable

a = 10

b = 20

temp = a

a = b

b = temp

- using arithmetic

a = 10

b = 20

~~temp = a~~ a = a + b

~~a = b~~ b = a - b

~~b = temp~~ a = a - b

- using XOR (bitwise swap)

a = 10

b = 20

a = a ^ b

b = a ^ b

print("a=", a)

print("b=", b)


```

a = 0 # 1st num in Series
b = 1 # second " "
i = 1 # counter (to count how many num printed)
while (i <= 10): # Repeat until 10 num are printed
    print(a) # print the current num (a)
    s = a + b # add a & b (next num in Series)
    a = b # move b into a (shift forward)
    b = s # move sum into b (next number)
    i = i + 1 # increase counter

```

How it works step by step

1. Start with $a = 0, b = 1$
2. Print $a \rightarrow (0)$
3. add $a + b = 0 + 1 = 1$
4. shift \rightarrow now $a = 1, b = 1$
5. print $a \rightarrow (1)$
6. add $a + b = 1 + 1 = 2$
7. shift \rightarrow now $a = 1, b = 2$
8. Print $a \rightarrow (1)$
- 9) continue like 10

* write a Program to calculate sum of digits without using any inbuilt fun

$$3582 = 3 + 5 + 8 + 2 = 18$$

\hookrightarrow num = int(input("enter a value"))

$$s = 0$$

while (num > 0):

$$\text{digit} = \text{num} \% 10$$

$$s = s + \text{digit}$$

$$\text{num} = \text{num} // 10$$

print(s)

How it works with 3582:

- 1) start \rightarrow num = 3582, $s = 0$
- 2) take last digit: $3582 \% 10 = 2 \rightarrow s = 0 + 2 = 2$
 \rightarrow remove digit \rightarrow num = $3582 // 10 = 358$
3. take last digit: $358 \% 10 = 8 \rightarrow s = 2 + 8 = 10$
 \rightarrow remove digit \rightarrow num = 35
- 4) take last digit: $35 \% 10 = 5 \rightarrow s = 10 + 5 = 15$
 \rightarrow remove digit \rightarrow num = 3
5. take last digit: $3 \% 10 = 3 \rightarrow s = 15 + 3 = 18$
 \rightarrow remove digit \rightarrow num = 0
- 6 loop ends: final answer = 18

- $\% 10 \rightarrow$ gives last digit
- $// 10 \rightarrow$ removes last digit

* Nested loops

A nested loop means one loop inside another loop. it's like repeating something inside another repetition.

eg: `for var1 in range():` : outer loop
 `for var2 in range():` : inner loop

* Table (1 to 10)

```
for i in range(1, 11, 1):  
    for j in range(1, 11, 1):  
        print(i*j, end=" ")  
    print()
```



```

* for i in range(1,11,1):
    for j in range(1,6,1):
        print(i*j, end=" ")
    print()

```

```

*
  2
2  4  6  8 10
  6    12
4  8  12 16 20
 10    20

```

```

for i in range(1,6,1):
    for j in range(1,6,1):
        if ((i*j)%2 == 0):
            print(i*j, end=" ")
        else:
            print(" ", end=" ")
    print("\n")

```