Pattern Printing 2

=> Warm up problem?

n = number
d = digit

i) n = 3
d = 2

=> 30 + 2 => 32

=> 32

ii) n = 32
d = 5

=> 320 + 5 => 325

Ans : 325

iii) n = 325
d = 1

=> 3250 + 1 => 3251

Ans => 3251

=> n x 10 + d =>

Q.1) number = 1523
reverse = ?

No string operations here

Ans: 3251

=> All digits of number => 1523

n = 1523
rev = 0
while n > 0 :
    dig = n % 10
    n = n // 10
    rev = rev * 10 + dig

n → d

$10\overline{)1523}\,|\,152$
10
52
50
23
20
3 => rem

=> n x 10 + d

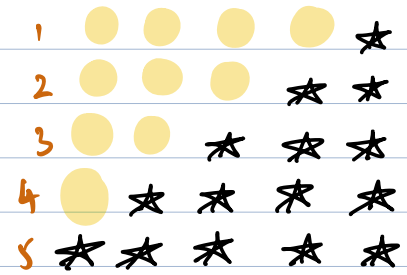
=> 0 x 10 + 3	=> 3
=> 3 x 10 + 2	=> 32
=> 32 x 10 + 5	=> 325
=> 325 x 10 + 1	=> 3251

=> n = 0
d = 3

=> n x 10 + 3 => ~~0 x 10~~ 0 + 3 => 3

Pattern :

n = 5



i	stars	spaces
1	1	(n-i) 4 (5-1)
2	2	(n-i) 3 (5-2)
3	3	(n-i) 2 (5-3)
4	4	(n-i) 1 (5-4)
5	5	(n-i) 0 (5-5)

i) No. of row

ii) What is in each row

iii) Relationship b/w row & what's inside it

iv) Sum up all

=>

```
for i in range(1, N+1):
    # for spaces.
    for j in range(N-i):
        print('_', end = '')
    for k in range(i):
        print('*', end = '')
    print()
```

⇒ Next Pattern :

n = 5

i		stars		spaces	
1	★ ★ ★ ★ ★	5	5 - 1 + 1 ⇒ 5	0	i - 1
2	● ★ ★ ★ ★	4	5 - 2 + 1 ⇒ 4	1	i - 1
3	● ● ★ ★ ★	3	5 - 3 + 1 ⇒ 3	2	i - 1
4	● ● ● ★ ★	2	5 - 4 + 1 ⇒ 2	3	i - 1
5	● ● ●● ★	1	5 - 5 + 1 ⇒ 1	4	i - 1
			n - i + 1		i - 1

(n i 1)

⇒ spaces : i - 1

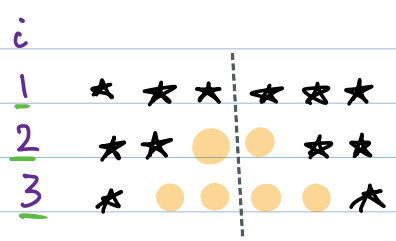
⇒ stars : n - i + 1

```
for i in range(1, n+1):
    # spaces
    for j in range(i-1):
        print('_', end='')
    # stars
    for k in range(n-i+1):
        print('*', end='')

    print()
```

Next pattern :

n = 3



i	stars	n-i+1	2*(i-1) spaces		2(i-1)
1	3	n-i+1	2x0	0	2(i-1)
2	2	n-i+1	2x(1)	2	2(i-1)
3	1	n-i+1	2x(2)	4	2(i-1)
		n-i+1			2(i-1)

no. of rows = n

stars = n-i+1

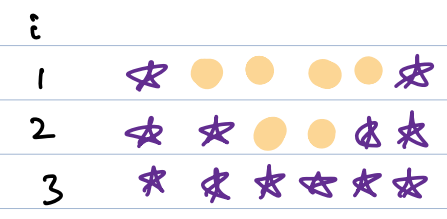
spaces = 2(i-1)

```
for i in range(1, n+1):
    # Print stars
    for j in range(n-i+1):
        print('*', end=' ')
    # print space
    for k in range(2*(i-1)):
        print('_', end=' ')
    # print remaining stars
    for m in range(n-i+1):
        print('_', end=' ')

    print()
```

Lower part

n = 3



i	stars	spaces	$2*(n-i)$
1	i	4	$2*(3-1)$
2	i	2	$2*(3-2)$
3	i	0	$2*(3-3)$

$2*(n-i)$

no. of rows = n

no. of star = i

no. of spaces = $2*(n-i)$

* full Hollow Diamond :