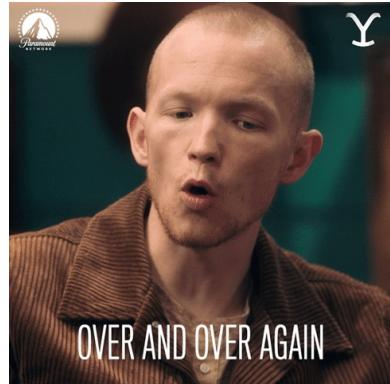
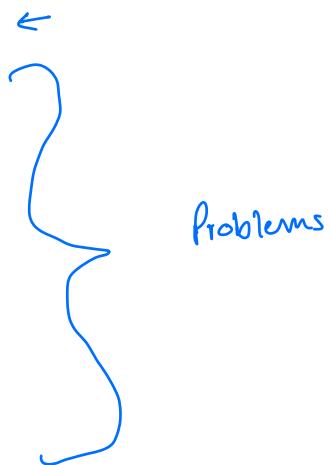


While loops



Agenda

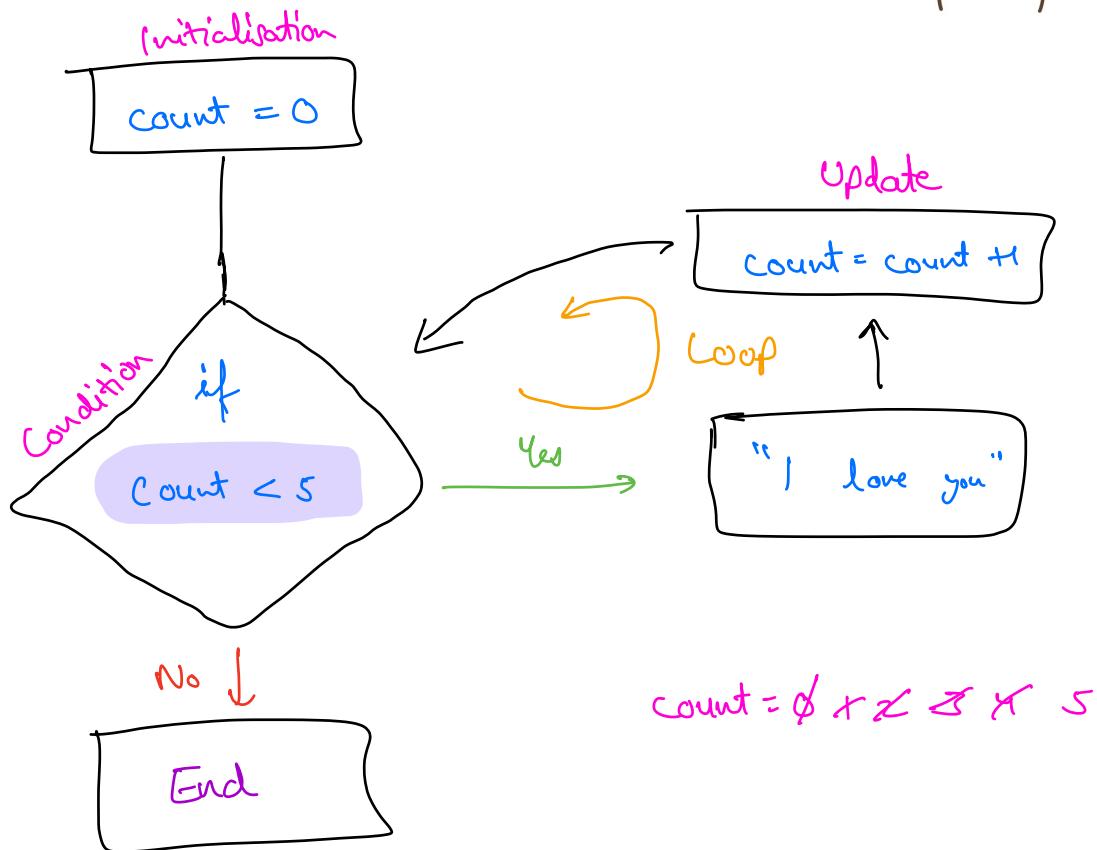
- Print end ←
- Loops Introduction
- Print 1 to N
- Print odd numbers
- Print even numbers
- Print powers of 2
- Print squares
- Reverse loops
- Working with testcases



problems

Challenge:

Print "I love you" 5 times.



Python Syntax

```

count = 0      ← Initialisation
while count < 5:   ← Condition
    print("I love you")} loop
    ——————  
           body
    ——————  
    count = count + 1  ← Update
    ——————
  
```

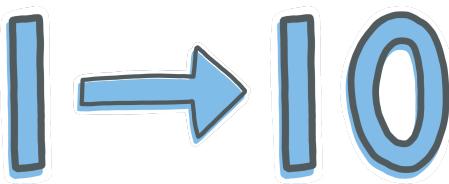
Output

```

I love you
  
```

Challenge:

Print all integers from 1 to 10.



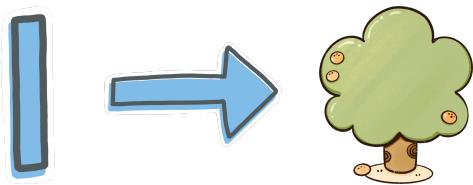
$i \rightarrow$ 1, 2, 3, 4, 5, ..., 9, 10 i_2

$i <$

$i = 1$ # Initialization
while $i \leq 10$: \leftarrow Condition
 print (i)
 $i = i + 1$ \leftarrow update

Challenge:

Print all integers from 1 to N.



Done

Challenge:



Print all odd integers from 1 to N.

$$N = 10$$

① $\xrightarrow{+2}$ $\xrightarrow{+2}$ $\xrightarrow{+2}$ $\xrightarrow{+2}$ 1, 3, 5, 7, 9

1 5 9
7 3

$$N = 11$$

①, 3, 5, 7, 9, 11

$i = 1$ \leftarrow Initialisation
while $\underline{i \leq N}$: \leftarrow condition
 print(i)
 $i = i + 2$ \leftarrow Update

Break

Till

10:15 PM

Challenge:

Print all multiples of 4 from 1 to N.

N=20

4, 8, 12, 16, 20
↑ ↑ ↑ ↑ ↑
+4 +4 +4 +4

→ N=15

4, 8, 12,
↑ ↑
+4 +4

N.Y. 4 >= 0 → F

8

4



Initialisation

i=4

Condition

i <= N

Update

i = i+4

Challenge:

Print all powers of 2 of numbers
from 1 to N.

2

2^i

N = 5

2	,	4	,	8	,	16	,	32
↑		↑		↑		↑		↑
2^1		2^2		2^3		2^4		2^5

N = 3

2	,	4	,	8
↑		↑		↑
2^1		2^2		2^3

print(2^i)

Initialization
 $i = 1$

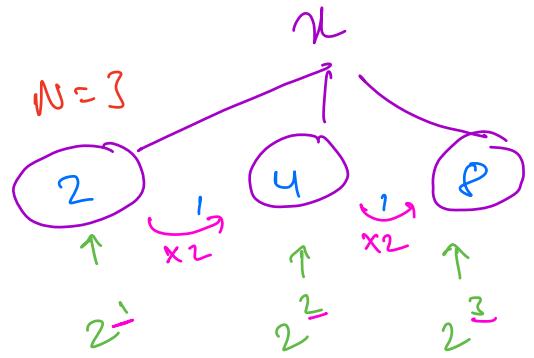
Condition
 $i \leq N$

Update

+1

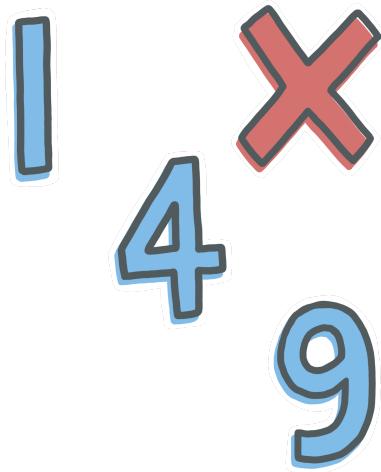
GREAT
JOB!

WELL!
DONE



Challenge:

Print all perfect squares of numbers from 1 to N.



$$N=5$$

$$\begin{array}{ccccc} 1 & 4 & 9 & 16 & 25 \\ \uparrow & \uparrow^2 & \uparrow^2 & \uparrow^2 & \uparrow^2 \\ \downarrow^2 & 2 & 3 & 4 & 5 \\ +1 & +1 & +1 & +1 & +1 \end{array}$$

print(i^2)
*i***i* i^{**2}

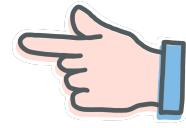
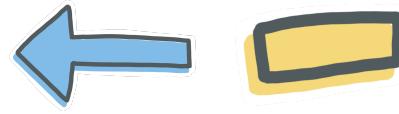
Initialisation
i=1

Update
i

Condition
i ≤ *N*

Challenge:

Print all numbers from N to 1.



$$N = 5$$

5, 4, 3, 2, 1
↑ i -1

$$N = 8$$

8, 7, 6, 5, 4, 3, 2, 1
↑ i -1 -1

Initialisation
 $i = N$

Condition
 $i \geq 1$

Update

$$i = i - 1$$

Challenge:

Print all even numbers from N to 1.

$$\underline{N=8}$$

8, 6, 4, 2
↑
 $N-1$

even

$$\underline{N=7}$$

6, 4, 2
↑
 $N-1$

odd

$$N=10$$

10, 8, 6, 4, 2
↑
 $N-1$

even

$$N=11$$

10, 8, 6, 4, 2
↑
 $N-1$

odd

Update

$$i = i - 2$$

8 4
6 2

Initialisation

if N is even

$$i = N$$

else N is odd

$$i = N-1$$

Condition

$$i \geq 2$$

Visualiser Tool

<https://pythontutor.com/visualize.html#mode=edit>

Doubts

Thank
You

$\log \rightarrow$ base 2, 10, e Commonly used

$$\log_{\text{---}}(64, 4) \rightarrow \log_4 64$$

↑
base

Good
Night

Thank
You

Monday

