

# For loops

## Agenda

- Ranges
- For loop introduction
- 1 to N
- N to 1
- Odd numbers

# Ranges

range ( 1 )

Default values  
start = 0  
end = 11  
inc = 1

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

---

end is excluded

range ( 5 )

start = 0 (Default)  
end = 5  
inc = 1 (Default)

0, 1, 2, 3, 4

---

start      end  
↓          ↓  
range ( 7 , 8 )

start = 7  
end = 8  
inc = 1 (Default)

7

end is excluded

range (8, 8)

start = 8

end = 8

inc = 1 (default)

[ ]

range (1, 8, 2)

start      end      inc  
↓        ↓        ↖  
1, 8, 2

start = 1

end = 8

inc = 2

+2  
↪  
1, 3, 5, 7

< 8

range (1, 11, 2)

start = 1

end = 11

inc = 2

1, 3, 5, 7, 9

↪    ↪    ↪  
+2   +2   +2

end is excluded

< 11

range(<sup>start</sup> 3, <sup>end</sup> 20, <sup>inc</sup> 3)

< 20

3, 6, 9, 12, 15, 18

---

range(<sup>start</sup> 5, <sup>end</sup> 1)

start = 5

end = 1

inc = 1 (By default)

1) start = 5

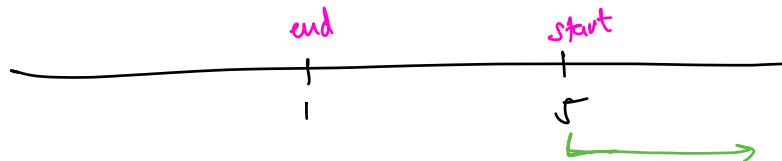
2) end = 1

3) inc = -1

4) inc = 1

NOT correct

< 1



range(<sup>start</sup> 5, <sup>end</sup> 1, <sup>inc</sup> -1)

5, 4, 3, 2

end is excluded

range (<sup>start</sup>10, <sup>end</sup>1, <sup>inc</sup>-3)

10, 7, 4,

end is excluded

range (10, -5, -3)

10, 7, 4, 1, -2,

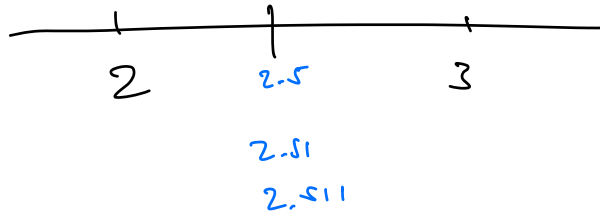
end is excluded

Break

till

10:01

PM



# For loop

Loops

→ while loop

→ for loop

used to traverse over an iterable



Anything that  
you can iterate  
upon

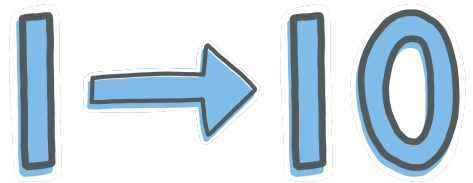
## Iterables

- ↳ Ranges
- Lists
- Tuples
- Sets
- Dicts
- Strings

Challenge:

Print all integers from 1 to 10.

Done



### Challenge:

Print all perfect squares of numbers  
from 1 to N.

$N=5$

1, 4, 9, 16, 25

`print(i2)`

start = 1  
end = N+1  
inc = 1   
          ↓  
          Default

}

`range(1, N+1, 1)`  
or  
`range(1, N+1)`

`range(1, 5)` → 1, 2, 3, 4

end is excluded

$s+1$   
↓  
`range(1, 6)` → 1, 2, 3, 4, 5



Challenge:

Print all multiples of 4 from 1 to N.

$N = 20$

4, 8, 12, 16, 20  
↑

start = 4

end = N+1

inc = 4

range(4, N+1, 4)

4

8



N or N+1

$N = 6$

for  $i$  in range(1,  $N+1$ ):

    print( $N - i + 1$ )

1, 2, 3, 4, 5, 6

$i$	$N - i + 1$
1	$6 - 1 + 1 = 6$
2	$6 - 2 + 1 = 5$
3	4
4	3
5	2
6	1

## For loop vs while loop

- Use for loop when you have a fixed range.
- Use while loop for all other cases.
- There is no difference in performance. Both loops would take the same amount of time.
- For-loop has a cleaner syntax.

# Doubts

Thank  
You

Multiples of 4 from N to 1

$$\underline{N = 11}$$

8, 4

$$\leftarrow \text{start} = N - 3$$

$$N \% 4 = 3$$

$$\underline{N = 10}$$

8, 4

$$\leftarrow \text{start} = N - 2$$

$$N \% 4 = 2$$

$$\underline{N = 9}$$

8, 4

$$\leftarrow \text{start} = N - 1$$

$$N \% 4 = 1$$

$$\underline{N = 8}$$

8, 4

$$\leftarrow \text{start} = N - 0$$

$$N \% 4 = 0$$

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TA's , Community , Hint , Google

→ Doubt Session (Optional) on Sunday (9 PM)  
(13<sup>th</sup> Nov)

while  $i^2 \leq N$ :

---

[ ]  
( ) } Maths

for <sup>variable</sup>  
↓  
\_\_\_\_\_ in \_\_\_\_\_  
↓  
<sup>Iterable (ranges)</sup>

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Digital circuit → Adder  
→ Multiplier

$10 - 2 \rightarrow 10 + (-2)$

Good  
Night

Thank  
You

Wednesday



