

Range:

<https://docs.python.org/3/library/stdtypes.html#range>

# Ranges

The `range` type represents an immutable sequence of numbers and is commonly used for looping a specific number of times in `for` loops.

```
class range(stop)
```

```
class range(start, stop[, step])
```

The arguments to the range constructor must be integers (either built-in `int` or any object that implements the `__index__` special method). If the `step` argument is omitted, it defaults to `1`. If the `start` argument is omitted, it defaults to `0`. If `step` is zero, `ValueError` is raised.

For a positive `step`, the contents of a range `r` are determined by the formula  $r[i] = \text{start} + \text{step} * i$  where  $i \geq 0$  and  $r[i] < \text{stop}$ .

For a negative `step`, the contents of the range are still determined by the formula  $r[i] = \text{start} + \text{step} * i$ , but the constraints are  $i \geq 0$  and  $r[i] > \text{stop}$ .

Range examples:

```
>>> list(range(10))
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
>>> list(range(1, 11))
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
>>> list(range(0, 30, 5))
[0, 5, 10, 15, 20, 25]
>>> list(range(0, 10, 3))
[0, 3, 6, 9]
>>> list(range(0, -10, -1))
[0, -1, -2, -3, -4, -5, -6, -7, -8, -9]
>>> list(range(0))
[]
>>> list(range(1, 0))
[]
```