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4.6.6. 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] = start + step*i` where `i >= 0` and `r[i] < stop`.

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

A range object will be empty if `r[0]` does not meet the value constraint. Ranges do support negative indices, but these are interpreted as indexing from the end of the sequence determined by the positive indices.

Ranges containing absolute values larger than `sys.maxsize` are permitted but some features (such as `len()`) may raise `OverflowError`.

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))
[]
```

Ranges implement all of the `common` sequence operations except concatenation and repetition (due to the fact that range objects can only represent sequences that follow a strict pattern and repetition and concatenation will usually violate that pattern).

start

The value of the `start` parameter (or `0` if the parameter was not supplied)

stop



range()

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start

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stop

→ Notebook 2

Iteration - for loop

```
for x in range(10): #0-9
    # Do something on x
    print('Item:', x)
```

```
fruits = ['Apple', 'Orange']

for fruit in fruits:
    print(fruit)
```