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1.11 Looping



Repeating blocks of code by calling a function more than once, as in example 1.5, can get cumbersome when it needs to be repeated many times. A **loop** repeats a block until some stopping condition is met. One type of loop in Python is a **while** loop, which repeats a block of code while its conditional expression evaluates to **True**. For instance,

The loop evaluates the conditional expression n < 5 and, if in fact n < 5, executes the block of code. After the block finishes, the test is repeated and potentially the block of code. This will repeat indefinitely, until the conditional expression evaluates to **False**, in which case the loop exits and execution resumes after the code block. The block will be executed 5 times, printing 0 through 4 to the console.

Another type of Python loop is a **for** loop, which has no explicit conditional expression, instead iterating through an iterable object like a list, , until it reaches the end. For example,

```
1 = ["foo", "bar", "baz"]
for s in 1:
    print(f"Say {s}")
```

This prints

Say foo Say bar Say baz

It is common to loop through a range with a **for** loop, as in the following:

```
for k in range(2, 8):
    print(k, end=" ") # Prints on the same line
```

This prints the following to the console:

```
2 3 4 5 6 7
```

Often, a loop index is required inside a **for** loop. The syntax for this requires an identifier for the index and an enumerate type object to be iterated through. The constructor function enumerate() assigns an index to each element of its iterable argument (e.g., a list). For instance,

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```
names = ["Manny", "Bella", "Amadeus"]
signs = ["Libra", "Virgo", "Sagittarius"]
for i, name in enumerate(names):
    print(f"{name} is a {signs[i]}")
```

This prints the following to the console:

```
Manny is a Libra
Bella is a Virgo
Amadeus is a Sagittarius
```

Looping through a dictionary is similar, but we need the items() of the dictionary for the key-value pair, as follows:

```
sounds = {"dog": "woof", "cat": "meow", "fox": "ring-ding-ding"}
for k, v in sounds.items():
    print(f"The {k} says '{v}'")
```

This prints the following to the console:

```
The dog says 'woof'
The cat says 'meow'
The fox says 'ring-ding-ding'
```

1.12 Summary [Outlined]



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