

6.11: FORMAT OPERATOR



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The *format operator*, `%` allows us to construct strings, replacing parts of the strings with the data stored in variables. When applied to integers, `%` is the modulus operator. But when the first operand is a string, `%` is the format operator.

The first operand is the *format string*, which contains one or more *format sequences* that specify how the second operand is formatted. The result is a string.

For example, the format sequence `"%d"` means that the second operand should be formatted as an integer (`d` stands for "decimal"):

```
>>> camels = 42
>>> '%d' % camels
'42'
```

The result is the string `"42"`, which is not to be confused with the integer value `42`.

A format sequence can appear anywhere in the string, so you can embed a value in a sentence:

```
>>> camels = 42
>>> 'I have spotted %d camels.' % camels
'I have spotted 42 camels.'
```

If there is more than one format sequence in the string, the second argument has to be a tuple¹. Each format sequence is matched with an element of the tuple, in order.

The following example uses `"%d"` to format an integer, `"%g"` to format a floating-point number (don't ask why), and `"%s"` to format a string:

```
>>> 'In %d years I have spotted %g %s.' % (3, 0.1, 'camels')
'In 3 years I have spotted 0.1 camels.'
```

The number of elements in the tuple must match the number of format sequences in the string. The types of the elements also must match the format sequences:

```
>>> '%d %d %d' % (1, 2)
TypeError: not enough arguments for format string
>>> '%d' % 'dollars'
TypeError: %d format: a number is required, not str
```

In the first example, there aren't enough elements; in the second, the element is the wrong type.

The format operator is powerful, but it can be difficult to use. You can read more about it at

<https://docs.python.org/3.5/library/stdtypes.html#printf-style-string-formatting>.