

Formatted Strings

Often a simple print statement will be enough to track a script's progress. However, sometimes you want a more elaborate output for debugging. Or maybe you need a formatted string for the user interface.

Join

A common request is to take a list and join them together into a single string. Often a separator is needed to make the data look pretty. Often this is a space, comma, line break; or perhaps a dash in the case of zip codes and phone numbers.

In Javascript the `join` function was available on arrays. In Python, however, this is flipped around. The `join` function is actually on strings.

This means that `' '.join(sequence)` connects the elements in the sequence using the character inside the single quotes is between each element.

```
shopping_list = ['bread', 'milk', 'eggs']  
print(', '.join(shopping_list))
```

```
bread, milk, eggs
```

Formatting printing

Python has a very powerful formatting engine for making exactly the strings you need. The `format` function is one way to apply these options. Like `join`, `format` is applied to strings.

Comma as thousands separator

```
print('{:,}'.format(1234567890))
```

```
'1,234,567,890'
```

Date and Time

```
d = datetime.datetime(2020, 7, 4, 12, 15, 58)
print('{:%Y-%m-%d %H:%M:%S}'.format(d))
```

```
'2020-07-04 12:15:58'
```

Percentage

```
points = 190
total = 220
print('Correct answers: {:.2%}'.format(points/total))
```

```
Correct answers: 86.36%
```

Data Table

```
width=8
print(' decimal      hex    binary')
print('-'*27)
for num in range(1,16):
    for base in 'dXb':
        print('{0:{width}{base}}'.format(num, base=base, width=width), end=' ')
    print()
```

decimal	hex	binary

1	1	1
2	2	10
3	3	11
4	4	100
5	5	101
6	6	110
7	7	111
8	8	1000
9	9	1001
10	A	1010
11	B	1011
12	C	1100
13	D	1101
14	E	1110
15	F	1111

Reference

There are many more examples of formatted output in the official Python documentation. That is a good resource to bookmark.

<https://docs.python.org/3/library/string.html#formatspec>
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