OSLOMET

Collections, Strings, and Files

Collating information

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- We can add two strings together, concatenating their values. So `"Hello, "+"world!" == "Hello, world!"` would return `True`.
- We don't need the +. Putting them next to each other also concatenates them.
- We can multiply a string and an integer, repeating the string. So `"Cookie!"*3 == "Cookie!Cookie!Cookie!"` would return `True`.

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- `\uxxxx` and `\Uxxxxxxxx` prints the character with `xxxx` or `xxxxxxxx` as its hex value. Try printing `"\U0001F36A"`.

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- Save your name in a variable called `name`, then try printing
  `f"My name is {name}"`.

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- Many other formatting options are also available.

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  - `str.split(sep)` and `str.join(list)` splits a string into a list, or joins a list into a string. More on this after the next slides!

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- So `len(a_list)` returns `4`. And `len("How are ya?")` returns `11`.

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- With `s = "This is a list!"`, `s[0]` returns `"T"` and `s[-1]` returns `"!"`.

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- We can also add a "step". `"012345"[1:5:2]` would return `"13"`.

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- We can also add a "step". `"012345"[1:5:2]` would return `"13"`.
- The step can be negative! `"012345"[5:0:-1]` would return `"54321"`.

Slicing lists, tuples, and strings

- We fetch parts of a collection by slicing.
- If `a` is a list, tuple, or a string, we slice it by writing `a[start:stop]`.
- This returns a list, tuple, or string with all elements from position `start`, up to but not including position `stop`.
- `"How are you?"[2:5]` would return `"w a"`.
- One or both of these can be empty. That signifies it's most "extreme" value.
  - `"012345"[3:]` would return `"345"`.
  - `"012345"[:3]` would return `"012"`.
  - `"012345"[:]` would return `"012345"`.
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- The step can be negative! `"012345"[5:0:-1]` would return `"54321"`.
- Reversing a list, tuple, or string can therefore be done with `a[::-1]`.

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- The code `"".join(["Bob","ert"])` returns `"Bobert"`.

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- Using `get` would return `None` if the key doesn’t exist. Using square brackets would instead throw an error.

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More on dictionaries

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- The two middle lines in the code above could have been written as `car.update({"color": "black", "model": "Tin Lizzie"})`.

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  - `"color" in {"color": "black", "model": "T"}` returns `True`.
  - `"T" in {"color": "black", "model": "T"}` returns `False`.
- We use this with `if`-tests and `while`-loops.

```
car = {"brand": "Ford", "model": "T", "year": 1908}
if "color" in car:
    print(f"The color of my car is {car["color"]}")
else:
    print("My car seems to be colorless")
```

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l = ["A", "list", "of", 3.14, "different", ["hey", "a", "list"], "things"]
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- It loops through the collection, in each loop the value `i` represents the current collection-value.
- If we know that we want to loop, say, 100 times, we often use the `for i in range(100):`-construction. Here `range(100)` is essentially a list `[0, 1, ..., 99]` of 100 elements.

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- If we have a loop inside of a loop, the `break` keyword will only stop the current loop. The outer loop would keep running.

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- Breaking and continueing can be done in both `for`-loops and `while`-loops.

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- The `with` keyword can be used to automatically close a file.
- The code

```
with open("notes.txt", "w") as file:
    file.write("Hey i've made some notes")
print("The file is closed now")
```

closes the file for you.

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- The command `file.readline()` reads a single line from the file. The next time you call `file.readline()`, you'll get the second line, and so on.
- Python thinks of files as collections of lines. We can use this to loop through the whole file with a `for`-loop, like this:

```
with open("notes.txt") as file:
    for line in file:
        print(line, end="")
print()
print("The whole file has now been printed")
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- There is a last mode, `"r+"`. It lets you both read and write to a file. The writing continues from where you've read to.
- If you haven't read the whole file, this will probably overwrite something you'd like to keep.

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