LESSON 3

main.py

```
student = {
  "name": "Mariam",
  "score": 95
}
```

Py

list · dict · set

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PYTHON SCRIPTING & OOP

LESSON 3

Lists, Tuples, Dictionaries and Sets

The four built-in collections and when to use each

Lists

lists.py

```
scores = [88, 95, 72]
scores.append(91)            # [88, 95, 72, 91]
scores.insert(0, 60)         # [60, 88, 95, 72, 91]
top = sorted(scores, reverse=True)[:3]   # [95, 91, 88]
len(scores), max(scores), sum(scores) / len(scores)
```

- A list is an ordered, changeable collection in square brackets. append adds to the end, …
- Slicing works like strings: scores colon three gives the first three. sort changes the …

01

Tuples

tuples.py

```
kabul = (34.53, 69.17)              # latitude, longitude
lat, lon = kabul                    # unpacking
a, b = 1, 2
a, b = b, a                         # swap in one line
# kabul[0] = 0  -> TypeError: tuples cannot change
```

- A tuple is like a list but cannot change. Write it with parentheses, or just commas. Use …
- Unpacking assigns each part to a name in one line, and a function can return several values …

02

Dictionaries

dicts.py

```
student = {"name": "Mariam", "city": "Kabul", "score": 95}
student["score"] = 97                    # update
student["year"] = 2                      # add
student.get("email", "none")             # safe read
for key, value in student.items():
    print(f"{key:>6}: {value}")
```

- A dictionary maps keys to values, written with curly braces and colons. Looking up a key is …
- Use get to read a key safely with a default, and loop over items to get keys and values …

03

Sets

sets.py

```
cities = {"Kabul", "Herat", "Kabul"}     # {'Kabul', 'Herat'}
unique = set([3, 1, 3, 2, 1])             # {1, 2, 3}
a = {"python", "bash"}; b = {"python", "go"}
a | b      # union        {'python', 'bash', 'go'}
a & b      # intersection {'python'}
a - b      # difference   {'bash'}
```

- A set holds unique values with no order. Adding a duplicate does nothing, so converting a …
- Sets also do math: union with a bar, intersection with an ampersand, and difference with a …

04

Which Collection?

Type	Syntax	Use when
`list`	`[1, 2, 3]`	ordered, changeable
`tuple`	`(1, 2)`	fixed group
`dict`	`{"k": v}`	look up by key
`set`	`{1, 2}`	unique values

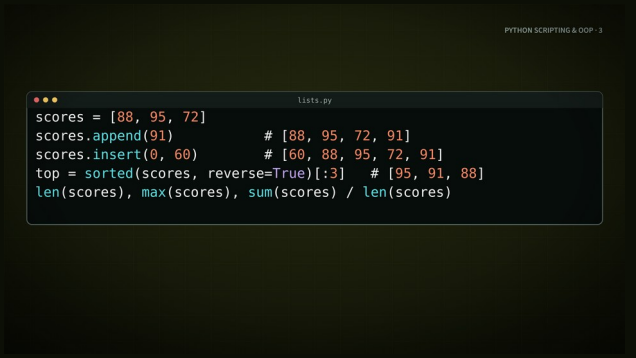
- Choose by what you need: order and changes, a list; fixed values, a tuple; lookup by name, …
- Real programs combine them, like a list of dictionaries, which is exactly what JSON data …

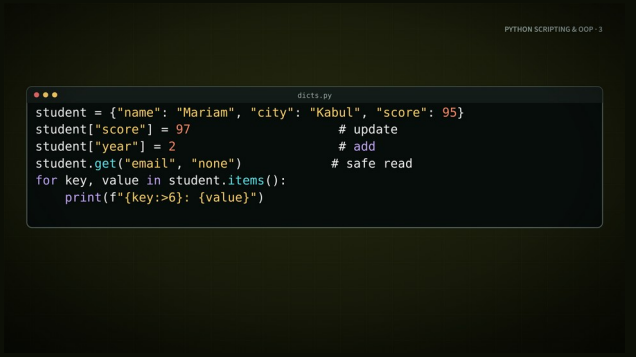
05

Lesson Map



Sources and Further Reading





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