```python
import marimo as mo
import random
```

Arrays and Dictionaries

Use `mo.ui.array` and `mo.ui.dictionary` to create UI elements that wrap other elements.

Because UI elements must be assigned to global variables, these functions are required when the set of elements to create is not known until runtime.

```python
create = mo.ui.button(label="Create new collections")
```

```python
create.center()
```

UI Elements ...

```python
create

array = mo.ui.array(
    [mo.ui.text()]
    + [mo.ui.slider(1, 10) for _ in range(0, random.randint(2, 5))],
)
dictionary = mo.ui.dictionary(
    {str(i): mo.ui.slider(1, 10) for i in range(0, random.randint(2, 5))}
)

mo.hstack([array, dictionary], justify="space-around")
```

... and their values

```python
mo.hstack([array.value, dictionary.value], justify="space-around")
```

Key difference between marimo dict and standard python dict:

The main reason to use `mo.ui.dictionary` is for reactive execution — when you interact with an element in a `mo.ui.dictionary`, all cells that reference the `mo.ui.dictionary` run automatically, just like all other ui elements. When you use a regular dictionary, you don't get this reactivity.

```python
create

slider = mo.ui.slider(1, 10, show_value=True)
text = mo.ui.text()
date = mo.ui.date()
```

```
mo_d = mo.ui.dictionary(
    {
        "slider": slider,
        "text": text,
        "date": date,
    }
)

py_d = {
    "slider": slider,
    "text": text,
    "date": date,
}

mo.hstack(
    [
        mo.vstack(["marimo dict", mo_d]),
        mo.vstack(["original elements", mo.vstack([slider, text, date])]),
        mo.vstack(["python dict", py_d]),
    ],
    justify="space-around",
)
```

marimo dict   original elements   python dict

In [ ]:
```
mo_d_ref = {k: mo_d[k].value for k in mo_d.value.keys()}
py_d_ref = {k: py_d[k].value for k in py_d.keys()}
mo.hstack(
    [
        mo.vstack(["reference of marimo dict", mo_d_ref]),
        mo.vstack(["reference of python dict", py_d_ref]),
    ],
    justify="space-around",
)
```

reference of marimo dict   reference of python dict

Notice that when you interact with the UI elements in the marimo dict, the reference of marimo dict updates automatically. However, when you interact with the elements in the python dict, you need to manually re-run the cell to see the updated values.