

Programming Thinking

Session 10

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Mutating lists

Lists are mutable values, and they provide functionality to add, delete, and update elements



Updating elements in the list

To update an element inside the list, we use a syntax similar to the one for declaring variables, but using the brackets and the index we refer to.

```
numbers = [1,2,4]
numbers[2] = 3
print(numbers) # prints [1,2,3]
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Demo



Appending elements to the list

To add a new element to the end of the list we use the `append()` method on it.

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numbers = [1,2,3]
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print(numbers) # prints [1,2,3,4]
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Demo



Inserting elements in the list

There's an alternative way of adding new elements to the list, and it's using the `insert()` method on it:

```
words = ["hello", "my", "friends"]  
words.insert(2, "dear")  
print(words) # prints ["hello", "my", "dear", "friends"]
```

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Demo



Removing elements from the list

In order to remove an element from a list, we should use the `.pop()` method, and pass the index of the element we want to remove

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For loops

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Demo

Let's see an example for adding all numbers in a list



Practice

Create a function `to_string` that receives a list of strings, concatenates all of them and returns it as a single string.



Checkpoint

Checkpoint

Is everybody following so far? Is there any question, comment?



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Dictionaries are another kind of collection in Python. Dictionaries map keys to values.



Creating dictionaries

We use curly brackets `{}` to declare dictionaries.

```
translations = {  
    "es": "Hola!",  
    "it": "Ciao!",  
    "en": "Hello!"  
}
```

colon for separating key and value

comma for separating entries



Creating dictionaries

We can also create empty dictionaries

```
translations = {}
```



Creating dictionaries



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Adding elements

We add elements to dictionaries given their specific index:

```
translations = {}  
translations["en"] = "Hello"  
translations["it"] = "Ciao"  
translations["es"] = "Hola"
```



Updating elements

we always can change a value in the dictionary by re-assigning the key

```
translations = {}  
translations["en"] = "Hello"  
translations["en"] = "WHATUP!"
```



Updating elements



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Deleting elements

We can delete an element of the dictionary using the **pop** method

```
translations = {}  
translations["en"] = "Hello"  
translations.pop("en")
```



Deleting elements



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Getting all keys or values

We can always get all **keys** or **values** from the dict as a list using either the **.keys()** or **.values()** method

```
users = {  
    1: "Pepe",  
    22: "Peter",  
    44143: "Johnny",  
    2: "Chuck"  
}
```

```
users.keys()  
users.values()
```



Getting all keys or values



for loops

In the same way we used **for** loops to iterate over elements of a list, we can use them to iterate over elements of a dictionary.

The difference is that, with dictionaries, the **iteration variable** will represent the **current key**, not the **current value**.



for loops

```
band = {  
    "johnny": "plays drums",  
    "joey": "plays guitar",  
    "markee": "sings",  
    "dee-dee": "plays bass-guitar"  
}  
  
for member in band:  
    print(member + " " + band[member] + " in The Ramones")
```

