

PHOT 110: Introduction to programming

LECTURE 10: Data, Dictionaries and Pandas (Ch. 6)

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STRUCTURED DATA: DICTIONARIES

WHAT IS A DICTIONARY ?

A list of key-value pairs with unique keys

```
1 # Defining
2 age = {"joe": 34, "tom": 20, "mary": 50}
3 print(age)
```

```
{'joe': 34, 'tom': 20, 'mary': 50}
```

```
1 # Using dict as a constructor
2 age = dict([("joe", 34), ("tom", 20), ("mary", 50)])
3 print(age)
```

```
{'joe': 34, 'tom': 20, 'mary': 50}
```

OPERATIONS: INDEXING, ADDING, DELETING

```
1 print(age["mary"])
```

50

```
1 # Adding an element  
2 age["Mikal"] = 56  
3 print(age)
```

```
{'joe': 34, 'tom': 20, 'mary': 50, 'Mikal': 56}
```

```
1 # Deleting an element  
2 del age["joe"]  
3 print(age)
```

```
{'tom': 20, 'mary': 50, 'Mikal': 56}
```

LOOPING OVER A DICTIONARY KEY-VALUE PAIRS

- methods `items()`, `keys()`, and `values()` extract key-value pairs, keys, and values of the dictionary
- These can be used within loops:

```
1 for k, v in age.items():  
2     print(k, v)
```

```
tom 20  
mary 50  
Mikal 56
```

LOOPING OVER A DICTIONARY KEY-VALUE PAIRS

- methods `items()`, `keys()`, and `values()` extract key-value pairs, keys, and values of the dictionary
- These can be used within loops:

```
1 for k in age.keys():  
2     if k != "Mikal":  
3         print(age[k])
```

20

50

LOOPING OVER A DICTIONARY KEY-VALUE PAIRS

- methods `items()`, `keys()`, and `values()` extract key-value pairs, keys, and values of the dictionary
- These can be used within loops:

```
1 for v in age.values():  
2     print(v)
```

20

50

56

DICTIONARY COMPREHENSION

Similar to list comprehension:

```
1 # List comprehension: creating a list
2 squares = [x**2 for x in range(1, 5)]
3 print(squares)
```

```
[1, 4, 9, 16]
```

With dictionaries use curly brackets and the colon separator:

```
1 # Dict comprehension: creating a Dict / Dictionary
2 numbers_and_squares = {x: x**2 for x in range(1, 5)}
3 print(numbers_and_squares)
```

```
{1: 1, 2: 4, 3: 9, 4: 16}
```


