# Dictionaries

Fall 2019

# Dictionaries

- An object that stores a collection of data
- Dictionaries have two essential parts:
  - Keys
    - The item you lookup a value by (words)
    - Kind of like an index in a list, but you can determine what the key is
    - Has to be unique
  - Values
    - The value associated with a certain key (definitions)
    - Doesn’t have to be unique
- Items in dictionaries are often referred to as key-value pairs

# Dictionary Anatomy

- Declared via { }
  - Items are in format `key: value`
  - Keys and values can be separate types (ints, floats, strings, etc)
- To print a specific value, it's similar to how you get a specific index in a range; just use the key instead

```
# makes a dictionary
netIDs = {"kdd195":"Kortni Neal", "dbn38":"Devin Neal"}

# prints dictionary
# also prints specific key
print(netIDs)
print(netIDs["kdd195"])
```

```
{'kdd195': 'Kortni Neal', 'dbn38': 'Devin Neal'}
Kortni Neal
```

# Adding Dictionary Entries

- To add to an existing dictionary, you just set whatever key you want to initialize equal to a value

```
# makes a dictionary
netIDs = {"kdd195":"Kortni Neal", "dbn38":"Devin Neal"}

# prints dictionary
# also prints specific key
print(netIDs)
print(netIDs["kdd195"])

# adding a new value
netIDs["mmn7"] = "Maggie Neal"

print(netIDs)
```

```
{'kdd195': 'Kortni Neal', 'dbn38': 'Devin Neal'}
Kortni Neal
{'kdd195': 'Kortni Neal', 'dbn38': 'Devin Neal', 'mmn7': 'Maggie Neal'}
```

# Removing Dictionary Items

- Can remove items via “del” command
- Works similarly to del in a list
- Must reference a specific key item

```
# deletes a value
del netIDs["kdd195"]

print(netIDs)
```

```
{'dbn38': 'Devin Neal', 'mmn7': 'Maggie Neal'}
```

# Printing Dictionary Items

- Can use a for loop to print all the items
- This method gets the *keys* from a dictionary
  - To print the values, you will have to get the value using the key

```
# prints the dictionary
# uses a for loop
for key in netIDs:
    print("Key:", key)
    print("Value:", netIDs[key])
    print()
```

```
Key: kdd195
Value: Kortni Neal

Key: dbn38
Value: Devin Neal

Key: mmn7
Value: Maggie Neal
```

# Dictionaries: Notes

| Method | Description |
|---|---|
| `clear` | Clears the contents of a dictionary. |
| `get` | Gets the value associated with a specified key. If the key is not found, the method does not raise an exception. Instead, it returns a default value. |
| `items` | Returns all the keys in a dictionary and their associated values as a sequence of tuples. |
| `keys` | Returns all the keys in a dictionary as a sequence of tuples. |
| `pop` | Returns the value associated with a specified key and removes that key-value pair from the dictionary. If the key is not found, the method returns a default value. |
| `popitem` | Returns a randomly selected key-value pair as a tuple from the dictionary and removes that key-value pair from the dictionary. |
| `values` | Returns all the values in the dictionary as a sequence of tuples. |

# Dictionary Built-In Functions

- Can loop through values using some of the built-in functions available
  - You cannot access keys, though (only values)
- items() function is pretty specialized

```
# prints the dictionary (value edition)
# uses a for loop
for item in netIDs.values():
    print(item)
    print()
```

```
print(netIDs.items())
```

```
dict_items([('kdd195', 'Kortni Neal'), ('dbn38', 'Devin Neal'), ('mmn7', 'Maggie
 Neal')])
```

# Dictionaries: Notes

- You can check if a key is in a dictionary
  - For values, you'd need the use a built-in function
- You can create an empty dictionary to add items to later

```
if "kdd195" in netIDs:
    print("This is present")

elif "kdd195" not in netIDs:
    print("This is not present")
```

```
if "kdd195" in netIDs.values():
    print("Present")

else:
    print("Not present")
```

```
# makes an empty dictionary
sample = {}
```

# Dictionaries: Extras

- Dictionary *values* can be lists (keys cannot)
  - You can have a dictionary nested inside of a dictionary (as values, not keys)

```
phoneNums = {"kortni":["662-555-5555", "901-555-0231"], "robin":["901-444-3241"]}

for key in phoneNums:
    print("Key:", key)
    print("Phone numbers:")

    for item in phoneNums[key]:
        print(item)

    print()
```

```
Key: kortni
Phone numbers:
662-555-5555
901-555-0231

Key: robin
Phone numbers:
901-444-3241
```