# Sets and Dictionaries

## Exercises

### Week 7

Prior to attempting these exercises ensure you have read the lecture notes and/or viewed the video, and followed the practical. You may wish to use the Python interpreter in interactive mode to help work out the solutions to some of the questions.

Download and store this document within your own filespace, so the contents can be edited. You will be able to refer to it during the test in Week 6.

Enter your answers directly into the highlighted boxes.

For more information about the module delivery, assessment and feedback please refer to the module within the MyBeckett portal.

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Specify two ways in which a Set varies from a List.

*Answer:*

Two ways in which a set varies from a lists are:

Sets can't contain duplicates.

A set contains an unordered collection of immutable values, hence they

cannot contain lists.

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Write a Python statement that uses the set() *constructor* to produce the same Set as the following -

languages = { "C++", "Java", "C#", "PHP", "JavaScript" }

*Answer:*

languages = {"C++", "Java", "C#", "PHP", "JavaScript"}

new\_set = set(languages)

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Is a Set **mutable** or **immutable**?

*Answer:*

A Set is mutable.

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Why does a Set not support *indexing* and *slicing* type operations?

*Answer:*

Sets, though mutable, are unordered. Thus, there is no scope for indexing. Indexing or slicing cannot change or access an item of a set.

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Why is a frozenset() different from a regular set?

*Answer:*

A frozenset() supports only the accessor type operations, since it is immutable, whereas a regular set supports both mutators and accessors.

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How many elements would exist in the following set?

names = set("John", "Eric", "Terry", "Michael", "Graham", "Terry")

*Answer:*

5 elements would exist in a following set.

And how many elements would exist in this set?

vowels = set("aeiou")

*Answer:*

5 elements would exist in this set.

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What is the name given to the following type of expression which can be used to programmatically populate a set?

chars = {chr(n) for n in range(32, 128)}

*Answer:*

It is known as a "set comprehension."

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What **operator** can be used to calculate the intersection (common elements) between two sets?

*Answer:*

the & (ampersand) operator is used to calculate the intersection of two sets.

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What **operator** can be used to calculate the difference between two sets?

*Answer:*

the - (minus) operator is used to calculate the difference between two sets.

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What would be the result of each of the following expressions?

{ "x", "y", "z" } < { "z" , "u", "t", "y", "w", "x" }

*Answer:*

The result of the following expression is True

{ "x", "y", "z" } < { "z", "y", "x" }

*Answer:*

The result of the following expression is False

{ "x", "y", "z" } <= { "y", "z", "x" }

*Answer:*

The result of the following expression is True

{ "x" } > { "x" }

*Answer:*

The result of the following expression is False

{ "x", "y" } > { "x" }

*Answer:*

The result of the following expression is True

{ "x", "y" } == { "y", "x" }

*Answer:*

The result of the following expression is True

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Write a Python statement that uses a **method** to perform the equivalent of the following operation -

languages = languages | { "Python" }

*Answer:*

To perform the equivalent operation of languages = languages | { "Python" } using a method, you can use the .update() method of the set.

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Do the elements which are placed into a set always remain in the same position?

*Answer:*

No, the elements in a set do not have a fixed or guaranteed order.

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Is the following operation a **mutator** or an **accessor**?

languages &= oo\_languages

*Answer:*

The following operation is a mutator

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What term is often used to refer to each *pair* of elements stored within a **dictionary**?

*Answer:*

key/value pair is often used to refer to each pair of elements stored within a dictionary.

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Is it possible for a dictionary to have more than one **key** with the same value?

*Answer:*

A dictionary stores elements as pairs, often called a key: value pair

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Is it possible for a dictionary to have the same **value** appear more than once?

*Answer:*

Yes, it is possible.

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Is a Dictionary **mutable** or **immutable**?

*Answer:*

A dictionary is mutable

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Are the **key** values within a dictionary **mutable** or **immutable**?

*Answer:*

The key values within a dictionary are immutable

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How many *elements* exist in the following dictionary?

stock = {"apple":10, "banana":15, "orange":11}

*Answer:*

Three elements exist in the following dictionary.

And, what is the data-type of the **keys**?

*Answer:*

String is the data type of keys.

And, what output would be displayed by executing the following statement -

print(stock["banana"])

*Answer:*

15.

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Write a Python statement that uses the dictionary() *constructor* to produce the same dictionary as the following -

lang\_gen = { "Java":3, "Assembly":2, "Machine Code":1 }

*Answer:*

lang\_gen = dict([("Java", 3), ("Assembly", 2), ("Machine Code", 1)])

print(lang\_gen)

Now write a simple expression that tests whether the word "Assembly" is a member of the dictionary.

*Answer:*

"Assembly" in lang\_gen

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Write some Python code that uses a for statement to iterate over a dictionary called module\_stats and print only its **values** (i.e. do not output any keys) -

*Answer:*

module\_stats = {

'module1': 75,

'module2': 82,

'module3': 90

}

for value in module\_stats.values():

print(value)

Now write another loop which prints the only the **keys** -

*Answer:*

module\_stats = {

'module1': 75,

'module2': 82,

'module3': 90

}

for key in module\_stats.keys():

print(key)

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Is it possible to construct a dictionary using a **comprehension** style expression, as supported by lists and sets?

*Answer:*

Yes, it is possible to construct a dictionary using a **comprehension** style expression, as supported by lists and sets.

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When a Dictionary type value is being passed as an argument to a function, what characters can be used as a prefix to force the dictionary to be **unpacked** prior to the call being made?

*Answer:*

A double asterisk (\*\*).

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## **Exercises are complete**

Save this logbook with your answers. Then ask your tutor to check your responses to each question.