# 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:*

1. A set contains an unordered collection of values, thus they do not support indexing, slicing or any method based on an element’s position.

2. A value can appear at most once within the set.

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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 = set(["C++", "Java", "C#", "PHP", "JavaScript"])

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

*Answer:*

A Set is mutable as the elements can be changed after it has been created, but an immutable version of a Set known as a Frozenset can also be created.

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

*Answer:*

Since sets do not support the concept of element positioning, they do not support indexing and slicing type operations which are based on an element’s position.

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

*Answer:*

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

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How many elements would exist in the following set?

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

*Answer:*

5 elements.

And how many elements would exist in this set?

vowels = set("aeiou")

*Answer:*

5 elements

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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:*

Set Comprehensions.

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

*Answer:*

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

*Answer:*

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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:*

True

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

*Answer:*

False

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

*Answer:*

True

{ "x" } > { "x" }

*Answer:*

False

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

*Answer:*

True

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

*Answer:*

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:*

languages.update({“python”})

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

*Answer:*

No.

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

languages &= oo\_languages

*Answer:*

Mutator.

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

*Answer:*

key:value

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

*Answer:*

Yes.

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

*Answer:*

Yes.

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

*Answer:*

Mutable.

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

*Answer:*

Immutable.

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How many *elements* exist in the following dictionary?

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

*Answer:*

3 elements.

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

*Answer:*

str (‘dict\_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 })

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

*Answer:*

if “Assembly” in lang\_gen:

print(“””The word "Assembly" is a member of the dictionary.”””)

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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:*

for i in module\_stats.values():

print(i)

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

*Answer:*

for i in module\_stats.keys():

print(i)

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

*Answer:*

Yes.

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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:*

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## **Exercises are complete**

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