# 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:*

Sets are unordered, while Lists are ordered.

Sets do not allow duplicate elements.

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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:*

mutable

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

*Answer:*

Sets are unordered collections.

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

*Answer:*

Frozensets are immutable

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How many elements would exist in the following set?

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

*Answer:*

5 (Sets do not allow duplicates; "Terry" is only counted once)

And how many elements would exist in this set?

vowels = set("aeiou")

*Answer:*

5 (Each character is treated as a separate element).

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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 comprehension.

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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 (The first set is a proper subset of the second)

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

*Answer:*

False (Not a proper subset)

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

*Answer:*

True (Subset comparison allows equality)

{ "x" } > { "x" }

*Answer:*

False (Not a proper superset)

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

*Answer:*

True (Proper superset).

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

*Answer:*

True (Sets are unordered; equality depends on elements, not order).

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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** (Sets are unordered).

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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 pair.

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

*Answer:*

No (Keys must be unique)

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

*Answer:*

Yes (Values can repeat)

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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 (Keys must be hashable).

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How many *elements* exist in the following dictionary?

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

*Answer:*

3

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

*Answer:*

str (Strings).

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:*

"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:*

for value in module\_stats.values():

print(value)

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

*Answer:*

for key in module\_stats.keys():

print(key)

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

*Answer:*

Yes

squares = {x: x\*\*2 for x in range(1, 6)}

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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.