# 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:*

Firstly, sets do not support indexing, whereas lists support element positioning. Secondly, sets are unordered, whereas lists are ordered.

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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:*

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

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

*Answer:*

Sets are mutable.

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

*Answer:*

Sets are an unordered collection of values, therefor the order of initialisation values is not maintained in different outputs.

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

*Answer:*

Frozenset() is different from regular set as it is immutable and only supports accessors.

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How many elements would exist in the following set?

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

*Answer:*

It will throw a TypeError and has 6 arguments.

And how many elements would exist in this set?

vowels = set("aeiou")

*Answer:*

There are 5 elements 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:*

The expression is called set comprehension.

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

*Answer:*

The & operator is used to calculate the intersection of sets.

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

*Answer:*

The – 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:*

True, because the x,y,z is an subset of the larger set.

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

*Answer:*

False, because the two sets are not a proper sub-set and is equal to each other.

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

*Answer:*

True, because they are equal to each other and the same.

{ "x" } > { "x" }

*Answer:*

False, because proper sets are not equal.

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

*Answer:*

True, because x,y is a super-set of the smaller set.

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

*Answer:*

True because they are equal.

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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 = languages.union({“Python”)

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

*Answer:*

No, because the sets values are unordered.

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

languages &= oo\_languages

*Answer:*

This is a mutator but applied with augmented assignment.

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

*Answer:*

The term is called a 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, each key is a unique value.

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

*Answer:*

Yes, dictionaries can have the same values as different keys can be used to map the same value.

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

*Answer:*

Dictionaries are mutable and key:value pairs can be added or removed.

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

*Answer:*

The key values are immutable.

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How many *elements* exist in the following dictionary?

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

*Answer:*

In the above dictionary, three elements exist.

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

*Answer:*

The data-type of the keys is str or strings.

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

print(stock["banana"])

*Answer:*

The output would be the value of “banana” which is 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:*

If “Assembly” in Lang\_gen:

print(“yes”)

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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 key in module\_stats.values():

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, dictionary can be made using dictionary comprehension.

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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:*

The \*\* characters can unpack a dictionary before a function call.

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## **Exercises are complete**

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