# Introduction to Programming

## Exercises

### Week 1

Prior to attempting these exercises ensure you have read thelecture notes and/or viewed the video, and also completed 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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What is the name of the programming language that we will be using on this module? What version of the language are we using?

*Answer:*

We will be using the Python programming language on this module. We will be using Python version 3.7 or later.

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A computer program takes some *input*, performs some *processing* then…. what?

*Answer:*

A computer program takes some input, performs some processing and then gives an output.

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What generation of programming language is *machine code*?

*Answer:*

Machine code is a first generation (1GL) programming language.

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Which of the following is known as a second generation programming language?

* C++
* Java
* Assembly
* R
* Python

*Answer:*

Only Assembly from the above list is known as a second generation programming language.

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State one problem associated with writing code in Assembly Language.

*Answer:*

One problem associated with writing code in Assembly Language is that the code is not portable because different processors have different underlying machine code and architecture.

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What generation of programming language is *Python*?

*Answer:*

Python is a third generation (3GL) programming language.

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What is the purpose of a *compiler*?

*Answer:*

The purpose of a compiler is to convert higher level programming language source code into assembly code or machine code.

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The Python interpreter uses an interaction model called **REPL**. What does this stand for?

*Answer:*

REPL stands for Read Evaluate Print Loop.

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Is it true that Python development always has to take place using *interactive-mode* within the Python interpreter?

*Answer:*

No, python development, i.e. writing of python code can be done in any IDE or text editor other than just using the interactive-mode python interpreter.

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What does the term IDE stand for?

*Answer:*

The term IDE stands for Integrated Development Environment.

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What is the main reason why programmers use *code libraries*?

*Answer:*

The main reason programmers use code libraries is to perform significant tasks with little or modest amounts of self-written code and also to help avoid re-inventing the wheel (i.e. to not rewrite the code that is already available to be used for given task.

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The Python language is often used in the field of *data-science*. What other language specifically supports *data-science*?

*Answer:*

R is another language that specifically supports data-science.

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An expression within a programming language consists of *operands* and *operators*.

Given an expression such as: 20 + 10, which part of this is the *operator*?

*Answer:*

Here, + is the operator.

And, which part of this is the *operand*?

*Answer:*

20 and 10 are the operands.

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Within Python, what calculation is performed by the ‘\*’ operator?

*Answer:*

\* operator performs multiplication.

And, what calculation is performed by the ‘/’ operator?

*Answer:*

/ operator performs division.

And, what calculation is performed by the ‘\*\*’ operator?

*Answer:*

\*\* operator performs exponentiation.

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Using the information about expression evaluation provided in the related tutorial, evaluate each of the following expressions **in your head** and type the result in the answer boxes below. Remember that an operator precedence is applied, but can be overridden by the use of parentheses.

a) 100 + 200 - 50

*Answer:*

250

b) 10 + 20 \* 10

*Answer:*

210

c) 20 % 3

*Answer:*

2

d) 20 / (2 \* 5)

*Answer:*

2

e) 20 / 2 \* 5

*Answer:*

50

f) 10 \* 2 + 1 \* 3

*Answer:*

23

g) 5 + 10 \*\* 2

​​​*Answer:*

105

h) (10 + 2 / 2) + ((10 \* 2) \*\* 2)

*Answer:*

411

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Use the Python interpreter to input and then execute a simple Python expression that adds the three numbers 100.6, 200.72 and 213.3, then write the result in the answer box below.

*Answer:*

514.62

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Use the Python interpreter to input and then execute a simple Python expression that multiplies the three numbers 20.25, 100 and 23.9, then write the result in the answer box below.

*Answer:*

48397.5

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Use the Python interpreter to input and then execute a simple Python expression that divides the number 10 by 0, then write the result in the answer box below.

*Answer:*

Traceback (most recent call last):

File "<stdin>", line 1, in <module>

ZeroDivisionError: division by zero

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What type of error is typically easier to identify? A *syntax* error? Or a *logical* error?

*Answer:*

A syntax error is easier to identify than a logical error.

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What type of message is used by the Python interpreter to report run-time errors?

*Answer:*

Python interpreter uses traceback messages to report run-time errors and exceptions.

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What command can be used to exit the Python interpreter?

*Answer:*

quit()

can be used to exit the python interpreter.

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## **Exercises are complete**

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