# 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:*

Python3

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

*Answer:*

After processing input, a computer program typically performs one or more of the following actions: output, storage, communication, user interaction, error handling, automation, loop/iteration, or termination.

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What generation of programming language is *machine code*?

*Answer:*

Machine code is often considered the first generation of programming languages. It is a low-level programming language that directly represents instructions and data as binary values that a computer's central processing unit (CPU) can execute. Machine code is specific to the computer's hardware architecture and is not human-readable. Programmers rarely write machine code directly; instead, they typically use higher-level programming languages and compilers or assemblers to generate machine code instructions for specific computer architectures.

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

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

*Answer:*

Assembly

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State one problem associated with writing code in Assembly Language.

*Answer:*

Writing code in Assembly Language can be challenging due to its low-level nature, making it error-prone and difficult to debug.

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What generation of programming language is *Python*?

*Answer:*

Python is a high-level, fourth-generation programming language.

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What is the purpose of a *compiler*?

*Answer:*

The purpose of a compiler is to translate high-level human-readable code into machine-executable instructions, checking for errors and often optimizing performance in the process.

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

*Answer:*

The term "REPL" stands for "Read-Eval-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:*

Python development can occur in both interactive mode (for testing and experimentation) and script mode (for larger applications).

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What does the term IDE stand for?

*Answer:*

IDE stands for "Integrated Development Environment," which is a software tool for coding and managing software projects.

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

*Answer:*

Programmers use code libraries to save time, reduce errors, and leverage pre-written, reliable code for common tasks.

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

*Answer:*

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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:*

In the expression "20 + 10," the plus sign (+) is the operator. Operators are symbols that represent specific operations or actions to be performed on the operands (in this case, the numbers 20 and 10). The operator determines what mathematical operation, in this case, addition, is to be applied to the operands.

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

*Answer:*

In the expression "20 + 10," the numbers 20 and 10 are the operands. Operands are the values or variables that operators act upon. In this case, the plus sign (+) is the operator that performs the addition operation on the operands 20 and 10.

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

*Answer:*

multiplication

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

*Answer:*

division

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

*Answer:*

The '\*\*' operator performs exponentiation, raising one number to the power of another.

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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:*

406

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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:*

result = 100.6 + 200.72 + 213.3

print(result)

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:*

48472.5

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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:*

You cannot divide a number by zero in Python; it raises a "ZeroDivisionError."

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

*Answer:*

Syntax errors are typically easier to identify than logical errors.

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

*Answer:*

The Python interpreter uses "exception messages" to report run-time errors.

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What command can be used to exit the Python interpreter?

*Answer:*

To exit the Python interpreter, use `exit()`, `exit`, or `quit`.

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## **Exercises are complete**

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