

Loughborough/London 3-day Hands-on Workshop on:

A Simple Introduction to Python

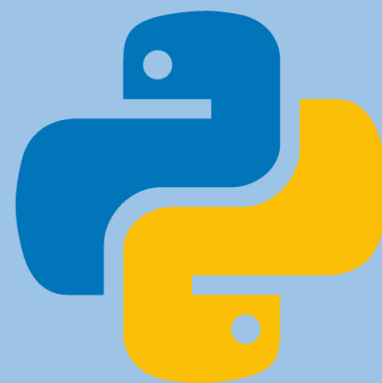
By Professor Stephen Lynch NTF FIMA SFHEA

Homepage: [Professor Stephen Lynch at Loughborough University](#)

Author of Two Patents and Ranked #18 in the World for Dynamical Systems

Author of PYTHON™, MATLAB®, MAPLE™ AND MATHEMATICA® BOOKS

National Teaching Fellow, STEM Ambassador, Public Engagement Champion and Speaker for Schools



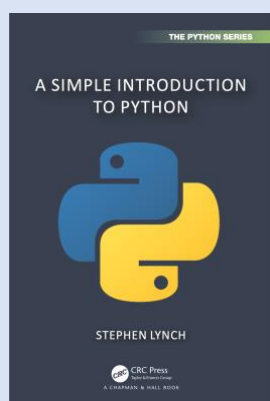
Workshop Dates

Dates: 15th September – 17th September, 2025

Certificate of Attendance

You must attend over 80% of the sessions.

The workshop is based on Stephen's book, "A Simple Introduction to Python", CRC Press, 2024.



A free copy of this 124-page reference e-book can be downloaded here:
[CRC Press](#)

Aim

To learn a high-level general-purpose programming language.

Objectives

- Use Python as a powerful calculator.
- Write simple programs.
- Produce figures and animations.
- Write professional notebooks.
- Incorporate programming into research and project dissertations.

Attend this workshop and learn:

- how to use Python as a powerful calculator
- how to program Python using IDLE
- how to plot fractals with the Turtle module
- how to plot 2-dimensional and 3-dimensional plots and animations
- how to do Mathematics with Python
- about cryptography, artificial intelligence, data science and object oriented programming

The workshop participants need no knowledge of any programming language.

The methods used in this workshop have been successfully tested on undergraduates and postgraduates for over 25 years.

This is a practical workshop using Python.

OBJECTIVES

The main objective of this workshop is to introduce delegates to programming using Python.

Participants will be introduced to Python and a number of platforms to perform the computations. Delegates can download software onto their own computers or use cloud computing, where no software needs to be downloaded onto your computer.

At the end of the workshop, delegates will have attained the following digital skillsets to add to their CV:



WORKSHOP OUTLINE

Day 1: INTRODUCTION to PYTHON IDLE

- Python as a Powerful Calculator
- Fractions and Symbolic Computation
- Powers
- The Math library
- Lists, Tuples, Sets & Dictionaries
- Defining Functions
- For and While Loops
- If, Elif, Else Statements
- The Cantor Set Fractal
- The Koch Snowflake Fractal
- A Bifurcating Tree Fractal
- The Sierpinski Triangle Fractal

Day 2: Mathematics and GitHub

- Numerical Python (NumPy)
- Matplotlib for Plotting and Animations
- Scatter Plots
- Surface Plots
- Google Colab and Cloud Computing
- Formatting Notebooks
- Symbolic Python
- GitHub
- Basic Algebra
- Solving Equations
- Mathematical Functions
- Differentiation and Integration

DAY 3: Python for Business

- The Caesar Cipher
- The XOR Cipher
- Rivest-Shamir-Adleman (RSA) Cryptosystem
- Simple RSA Algorithm Example
- Artificial Neural Networks (ANNs)
- AND/OR and XOR Gate ANNs
- The Backpropagation Algorithm
- Boston Housing Data
- Introduction to Pandas and Data Frames
- Load, Clean and Preprocess the Data
- Exploring the Data
- Violin, Scatter and Hexagonal Bin Plots
- Classes and Objects
- Encapsulation
- Inheritance and Polymorphism
- The Brick Breaker Game

The workshop includes practical, hands-on sessions where participants are given the opportunity to apply in practice the theory they have learnt. All Python solution program files can be downloaded through GitHub:

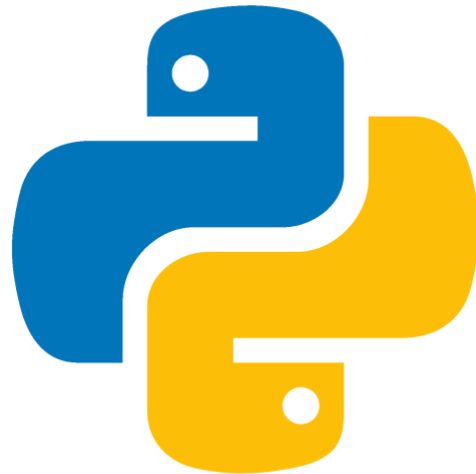
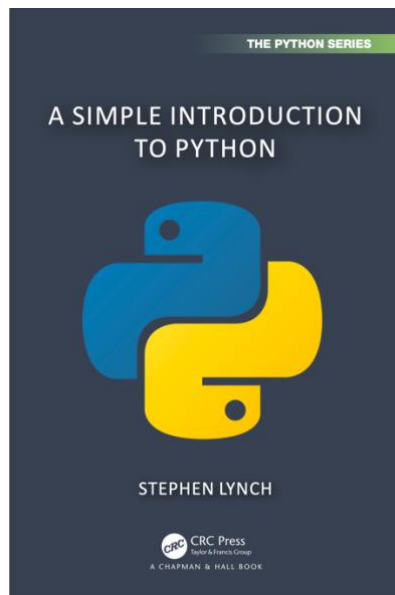
[Solutions in GitHub](#)

Delegates can view Python solution programs online via Jupyter notebooks:

[Solutions Jupyter Notebook](#)

A SIMPLE INTRODUCTION to PYTHON

Workshop Itinerary
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Day 1: 10am-12pm		12pm-2pm	
Using Python as a Calculator	10:00-10:50	The Turtle Library	12:00-12:50
Coffee Break	10:50-11:00	Coffee Break	12:50-13:00
Simple Programming	11:00-11:50	Exercises	13:00-14:00
Day 2: 10am-12pm		12pm-2pm	
NumPy and Matplotlib	10:00-10:50	Python for Mathematics	12:00-12:50
Coffee Break	10:50-11:00	Coffee Break	12:50-13:00
Google Colab and GitHub	11:00-11:50	Exercises	13:00-14:00
Day 3: 10am-12pm		12pm-2pm	
Cryptography	10:00-10:50	Artificial Intelligence	12:00-12:50
Coffee Break	10:50-11:00	Coffee Break	12:50-13:00
Data Science	11:00-11:50	Object Oriented Programming	13:00-14:00