

# INF1511

## Unit 1 Visual Programming I

### Environment Set Up & Data Operations



National Geographic  
Burmese Python | National Geographic



Dice  
Python: Best (Free) Way to Learn It ...



The New York Times  
Largest Python Found in Everglades ...



Python.org  
The Python Logo | Python Software ...



Wikiversity  
Python - Wikiversity



Data Science Central  
Python File Input/Output: Read & Write ...



Define tomorrow.

UNISA

college of  
science, engineering  
and technology

# Unit 1 Describe the programming concepts for computing including performing arithmetic operations

- Python and its features are explained
- Python is installed on different platforms
- Python can be interacted with through Command Line Mode
- Program is written in Python.
- Comments, continuation lines and printing messages.
- Arithmetic operations are performed.

# Overview

- **Environment.** Set up of programming environment.
- **Resources.** The use of Unisa library. *Python basics, GUI*
- **Theory** of data and data operations in programming.
- **Assessment** of learning in this unit.
- **Practical** application (and demonstration) of data and data operations in programming.

# Environment

- Please read the read-me-first document.
- On the internet, find ANACONDA installation.
- Install ANACONDA
- You are welcome to use any Python programming environment (HOWEVER only Anaconda is used in the teaching and learning and is supported in INF1511).

# Resources

## Python Books See Safari Additional Books

Python

1 - 10 of 12082 search results for "Python"

All Books Videos Learning Paths Playlists Audiobooks

Topics

Sort By Relevance



BOOK

Fluent Python, 2nd Edition

By Luciano Ramalho  
PYTHON

★★★★★ 46 reviews

O'Reilly Media, Inc. April 2022

Don't waste time bending **Python** to fit patterns you learned in other languages. Discover and apply idiomatic **Python** 3 features beyond your past experience. Author Luciano Ramalho guides you through **Python**'s core language features and libraries and teaches you how to make your code shorter, faster, and more readable. **Python**'s simplicity lets you become productive quickly, but often this means you aren't using everything it has to offer. With the updated edition of this hands-on guide, you'll learn...



BOOK

Python Crash Course, 2nd Edition

By Eric Matthes  
PYTHON

★★★★★ 50 reviews

No Starch Press May 2019

**Python** Crash Course, 2nd Edition teaches beginners the essentials of **Python** quickly so that they can build practical programs and develop powerful programming techniques. Uses **Python** 3 This is the second edition of the best selling **Python** book in the world. **Python** Crash Course, 2nd Edition is a straightforward introduction to the core of **Python** programming. Author Eric Matthes dispenses with the sort of tedious, unnecessary information that can get in the way of learning how to program, choosin...

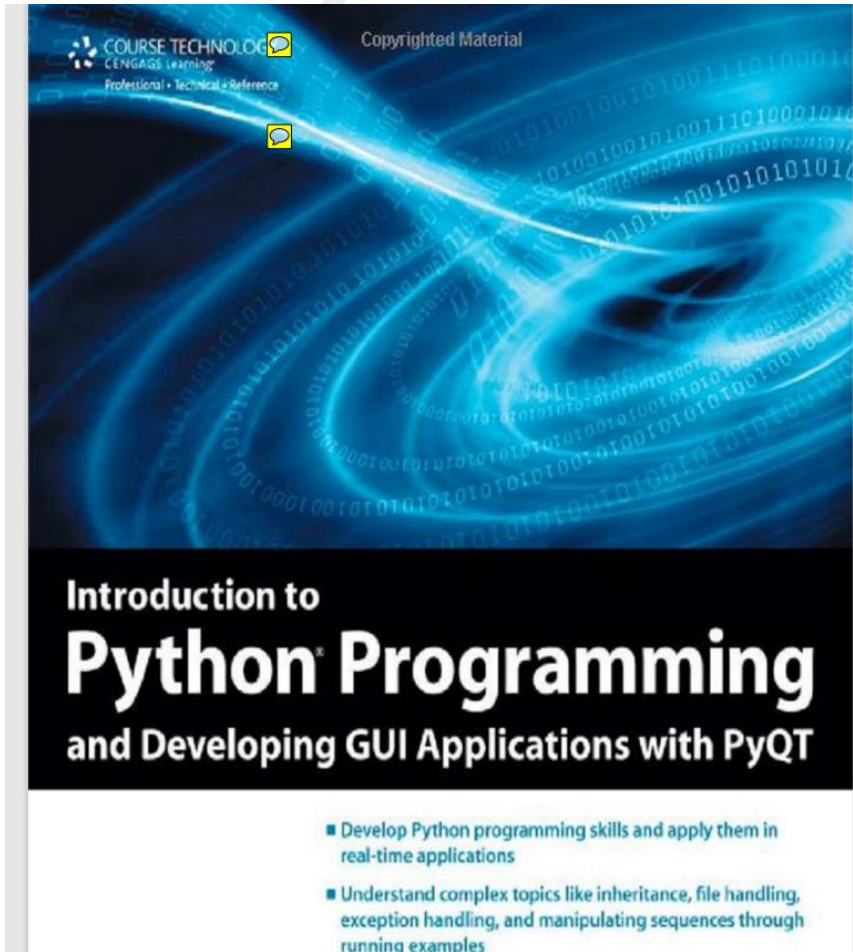


PLAYLIST

Three Ways To Learn Python

By Tim O'Reilly

# Additional resources (theory)



# Theory – What is programming?

- **Problem solving.** There is a problem.
- A system. Input, process and output.
- Where shall we start?
- Programming principles.
- Programming language used to solve a problem by applying the programming principles.
- Perseverance, practise, practise, ...persistence



# Theory – the elements

- The literals
- The variables
- The keywords



## Naming and using variables easier to read and understand

- Letters, numbers and underscores. Cannot start with a number.
- Use underscores NOT spaces.
- NO keywords.
- Meaningful names.
- Upper and lower case.

# Which are ok variable names?

- 1\_myname
- Hername\_1
- name surname
- name\_surname
- print
- The\_length\_of\_the\_surname
- l\_n

# Programming elements - Comments

- Comments ensure that code is more readable (by humans 😊).
- Useful, re-useable.
- Developing good programming habits – start today. Programming gets complicated, and programming teams get VERY large! Errors get expensive!
- Lots of comments, lots of back-ups ...

# Theory – Data, Data types and Operations (store data and use data)

1. Integers: 1,2,3,
2. Real (floating): 4.2 .... 78.989
3. Boolean: True / False
4. Complex numbers (real and imaginary part)
5. Strings: 'December' 'Mary' (quotes, immutable (cannot modify existing string))
6. Lists (ordered sequence), tuples (ordered, immutable), sets (unordered) and dictionaries
7. Operations: what you DO with the data.
8. **Number data types.** Add, Subtract, Multiply and Divide.
9. **String data types.** Partition, join, find, 'add', subset.

# Theory - Programming elements - Variables

- Variables – are assigned, hold data values.
- Names of variables made up of letters, numbers and underscores.
- The names CANNOT start with a number (1\_Num)
- The names CANNOT be keywords. (Keywords (30 in Python ... and else elif exec ... )
- Names must be the same case.
- Names must be short and meaningful.
- Spelling!!!!

# What is Python? Just a language ...

- Easy to learn
- Easy to read
- Uses white space
- Includes libraries
- Can be integrated
- Can be interpreted
- Memory management, exception handling
- Used for web-development, robotics, data science

# Theory - The Zen of Python (please read all)

- Beautiful is better than ugly.
- Simple is better than complex.
- Complex is better than complicated.
- Readability counts.
- NOW is better than never!



# Assessment for Unit 1

- **Theory MCQ quiz.** Three attempts.
- **Practical Programming activities** on Jupyter Notebook page. Practise! Complete Assignment 1.
- **Practical MCQ quiz Assignment 1.** One attempt.

# Assessment Plan – NO EXTENSIONS

## Assessment Plan

### ASSESSMENT INFORMATION

Click on edit next to the assessment number to edit assessment details.

Formative Assessments										
General					Year Mark					
Ass. Nr.	Format	Unique Nr.	Due Date	Opening Date	Type	Opt.	Normal weight	Repeat weight	Aegrotat weight	Remove?
1 <a href="#">Edit</a>	Quiz	536161	20240517 09:00	20240318 08:00	Individual	M	10	10	10	<input type="checkbox"/>
2 <a href="#">Edit</a>	Quiz	536173	20240923 09:00	20240408 08:00	Individual	M	15	15	15	<input type="checkbox"/>
3 <a href="#">Edit</a>	Quiz	536319	20240923 09:00	20240429 08:00	Individual	M	15	15	15	<input type="checkbox"/>
4 <a href="#">Edit</a>	Quiz	743913	20240923 09:00	20240520 08:00	Individual	M	10	10	10	<input type="checkbox"/>
5 <a href="#">Edit</a>	Quiz	743971	20240923 09:00	20240610 08:00	Individual	M	10	10	10	<input type="checkbox"/>
6 <a href="#">Edit</a>	Quiz	744040	20240923 09:00	20240708 08:00	Individual	M	10	10	10	<input type="checkbox"/>
7 <a href="#">Edit</a>	Quiz	744320	20240923 09:00	20240729 08:00	Individual	M	10	10	10	<input type="checkbox"/>
8 <a href="#">Edit</a>	Quiz	807325	20240923 09:00	20240819 08:00	Individual	M	20	20	20	<input type="checkbox"/>

# Summary Unit 1 INF1511

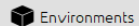
- This unit introduces and explains the concept of programming using Python software. This includes the components that are used to develop a program to capture input and to display output.
- **Objectives - you should be able to:**
  - To identify different implementations of Python.
  - To describe unique features of Python programming language.
  - To be aware of Python installations.
  - To list and implement the data types.
  - To apply concepts to solve problems using data operations for numbers.
- **Key Terms:** integers, literals, variables, print, comment

# Practical application

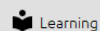
- DEMONSTRATION OF DATA TYPES AND DATA OPERATIONS.
- Using the ANACONDA programming environment.



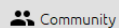
Home



Environments



Learning



Community

Documentation

Developer Blog



Applications on

base (root)

Channels



console\_shortcut

0.1.1

Console shortcut creator for Windows (using menuinst)

Launch



JupyterLab

1.1.4

An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture.

Launch



Notebook

6.0.1

Web-based, interactive computing notebook environment. Edit and run human-readable docs while describing the data analysis.

Launch



powershell\_shortcut

0.0.1

Launch



Qt Console

4.5.5

PyQt GUI that supports inline figures, proper multiline editing with syntax highlighting, graphical calltips, and more.

Launch



Spyder

3.3.6

Scientific PYTHON Development Environment. Powerful Python IDE with advanced editing, interactive testing, debugging and introspection features

Launch



Glueviz

0.15.2

Multidimensional data visualization across files. Explore relationships within and among related datasets.

Install



Orange 3

3.23.1

Component based data mining framework. Data visualization and data analysis for novice and expert. Interactive workflows with a large toolbox.

Install



RStudio

1.1.456

A set of integrated tools designed to help you be more productive with R. Includes R essentials and notebooks.

Install



VS Code

1.76.2

Streamlined code editor with support for development operations like debugging, task running and version control.

Install



# Thank you

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