

# Python

TechGuide - Alura, FIAP e PM3

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## Python

### Level 1

#### Python - Fundamentals:

Python is a high-level, general-purpose programming language that is widely used in web applications, software development, data science, and machine learning. Its design philosophy emphasizes code readability with the use of significant indentation. Python is dynamically typed and garbage-collected.

Knowing the primitive types

Declaring variables, considering the different types

Using conditional structures ('if', 'else')

Knowing the assignment and comparison operators

Using repetition structures and loops ('while', 'for')

Using functions, passing parameters and arguments

Manipulating methods

Manipulating arrays and lists

Getting data from an API

Creating constructors

#### Contents

WebSiteDocumentation Python (<https://docs.python.org/3/tutorial/>)

WebSiteW3Schools: Python Tutorial (<https://www.w3schools.com/python/>)

W3Schools:  
WebSite Python Variables ( [https://www.w3schools.com/python/python\\_variables.asp](https://www.w3schools.com/python/python_variables.asp))

W3Schools:  
WebSite Python Data Types ( [https://www.w3schools.com/python/python\\_datatypes.asp](https://www.w3schools.com/python/python_datatypes.asp))

W3Schools: Python  
WebSite Strings ( [https://www.w3schools.com/python/python\\_strings.asp](https://www.w3schools.com/python/python_strings.asp))

W3Schools:  
WebSite Python Operators ( [https://www.w3schools.com/python/python\\_operators.asp](https://www.w3schools.com/python/python_operators.asp))

W3Schools:  
WebSite Python If ... Else ( [https://www.w3schools.com/python/python\\_conditions.asp](https://www.w3schools.com/python/python_conditions.asp))

W3Schools:  
WebSite Python While Loops ( [https://www.w3schools.com/python/python\\_while\\_loops.asp](https://www.w3schools.com/python/python_while_loops.asp))

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Article What is Python? ( [https://aws.amazon.com/what-is/python/?nc1=h\\_ls](https://aws.amazon.com/what-is/python/?nc1=h_ls))

Article Introduction to Python Classes ( <https://towardsdatascience.com/introduction-to-python-classes-da526ff745df>)

YouTube Programming with Mosh: Python for Beginners - Learn Python in 1 Hour ( <https://www.youtube.com/watch?v=kqtD5dpn9C8>)

YouTube freeCodeCamp.org: Learn Python - Full Course for Beginners ( <https://www.youtube.com/watch?v=rfscVS0vtbw>)

## Object-oriented Programming Concepts:

Object-oriented programming (OOP) is a programming paradigm based on the concept of 'objects', which can contain data and code: data in the form of fields (often known as attributes or properties), and code, in the form of procedures (often known as methods). A common feature of objects is that procedures (or methods) are attached to them and can access and modify the object's data fields. Some of the main concepts are classes and instances, inheritance, and encapsulation.

How objects work

Creating and using constructors

What classes are

Creating and using Methods

How encapsulation works

What inheritance is

What polymorphism is

How interfaces work

What abstractions are

## Contents

WebSite	MDN Web Docs: Object-oriented programming (	<a href="https://developer.mozilla.org/en-US/docs/Learn/JavaScript/Objects/Object-oriented_programming">https://developer.mozilla.org/en-US/docs/Learn/JavaScript/Objects/Object-oriented_programming</a>	)
WebSite	Geeks for Geeks: Object Oriented Programming (OOPs) Concept in Java (	<a href="https://www.geeksforgeeks.org/object-oriented-programming-oops-concept-in-java/">https://www.geeksforgeeks.org/object-oriented-programming-oops-concept-in-java/</a>	)
WebSite	W3Schools: Object-Oriented Programming Style (	<a href="https://www.w3schools.blog/object-oriented-programming-style">https://www.w3schools.blog/object-oriented-programming-style</a>	)
Article	What is object-oriented programming? OOP explained in depth (	<a href="https://www.educative.io/blog/object-oriented-programming">https://www.educative.io/blog/object-oriented-programming</a>	)
YouTube	Programming with Mosh: Object-oriented Programming in 7 minutes (	<a href="https://www.youtube.com/watch?v=QJjY2TNyl-8">https://www.youtube.com/watch?v=QJjY2TNyl-8</a>	)
YouTube	freeCodeCamp.org: Intro to Object Oriented Programming - Crash Course (	<a href="https://www.youtube.com/watch?v=SiBw7os-_zI">https://www.youtube.com/watch?v=SiBw7os-_zI</a>	)
YouTube	Traversy Media: JavaScript OOP Crash Course (ES5 & ES6) (	<a href="https://www.youtube.com/watch?v=vDJpGenyHaA">https://www.youtube.com/watch?v=vDJpGenyHaA</a>	)

## Data Structures:

In the context of computers, the data structure is a specific way of storing and organizing data in the computer's memory so that these data can be easily retrieved and efficiently used when needed later.

Knowing the main data structures (linked list, stack, queue, tree, etc)

Implementing the main data structures

## Contents

WebSite	W3Schools: Data Structure Tutorial (	<a href="https://www.w3schools.in/data-structures/tutorials/">https://www.w3schools.in/data-structures/tutorials/</a>	)
WebSite	Geeks for Geeks: Data Structures (	<a href="https://www.geeksforgeeks.org/data-structures/">https://www.geeksforgeeks.org/data-structures/</a>	)
WebSite	Data Structures Tutorial (	<a href="https://www.javatpoint.com/data-structure-tutorial">https://www.javatpoint.com/data-structure-tutorial</a>	)
Article	8 Common Data Structures every Programmer must know (	<a href="https://towardsdatascience.com/8-common-data-structures-every-programmer-must-know-171acf6a1a42">https://towardsdatascience.com/8-common-data-structures-every-programmer-must-know-171acf6a1a42</a>	)
YouTube	Internet Made Coder: Data Structures Explained for Beginners - How I Wish I was Taught (	<a href="https://www.youtube.com/watch?v=ZdU4wMyiTSs">https://www.youtube.com/watch?v=ZdU4wMyiTSs</a>	)
YouTube	freeCodeCamp.org: Data Structures Easy to Advanced Course - Full Tutorial from a Google Engineer (	<a href="https://www.youtube.com/watch?v=ZdU4wMyiTSs">https://www.youtube.com/watch?v=ZdU4wMyiTSs</a>	)
YouTube	Aaron Jack: Data Structures you MUST know (as a Software Developer) (	<a href="https://www.youtube.com/watch?v=ZdU4wMyiTSs">https://www.youtube.com/watch?v=ZdU4wMyiTSs</a>	)

## Python - Collections:

A collection represents a group of objects, known as its elements. They are like containers that group multiple items into a single unit. Some collections allow duplication of elements and some do not. Some are ordered and some are unordered.

Using lists and tuples

Using polymorphism in collections

Using sets and dictionaries

## Contents

WebSite	W3Schools: Python Lists (	<a href="https://www.w3schools.com/python/python_lists.asp">https://www.w3schools.com/python/python_lists.asp</a>	)
WebSite	W3Schools: Python Tuples (	<a href="https://www.w3schools.com/python/python_tuples.asp">https://www.w3schools.com/python/python_tuples.asp</a>	)

WebSite	W3Schools: Python Sets (	<a href="https://www.w3schools.com/python/python_sets.asp">https://www.w3schools.com/python/python_sets.asp</a> )
WebSite	W3Schools: Python Dictionaries (	<a href="https://www.w3schools.com/python/python_dictionaries.asp">https://www.w3schools.com/python/python_dictionaries.asp</a> )
Article	Everything You Need To Know About Python Collections (	<a href="https://medium.com/edureka/collections-in-python-d0bc0ed8d938">https://medium.com/edureka/collections-in-python-d0bc0ed8d938</a> )
Article	Python Dictionaries (	<a href="https://medium.com/python-pandemonium/python-dictionaries-45cacc2b76aa">https://medium.com/python-pandemonium/python-dictionaries-45cacc2b76aa</a> )
YouTube	edureka!: Python Collections - Lists, Tuples, Sets & Dictionaries (	<a href="https://www.youtube.com/watch?v=QswQA1IRIQY">https://www.youtube.com/watch?v=QswQA1IRIQY</a> )
YouTube	Bro Code: Python dictionaries are easy (	<a href="https://www.youtube.com/watch?v=MZZSMaEAC2g">https://www.youtube.com/watch?v=MZZSMaEAC2g</a> )

## Python - Testing:

Software testing is the process of evaluating and verifying that a software product or application does what it is supposed to do. The benefits of testing include preventing bugs, reducing development costs and improving performance.

Using unit tests

Using integration testing

Using behavioral testing

Using mocks

## Contents

WebSite	Documentation Python - Unit testing framework (	<a href="https://docs.python.org/dev/library/unittest.html">https://docs.python.org/dev/library/unittest.html</a> )
Article	Python Testing with pytest (	<a href="https://medium.com/pragmatic-programmers/table-of-contents-86377afafc57">https://medium.com/pragmatic-programmers/table-of-contents-86377afafc57</a> )
Article	Unit Testing in Python — Patching, Mocks and Dependency Injection (	<a href="https://levelup.gitconnected.com/unit-testing-in-python-mocking-patching-and-dependency-injection-301280db2fed">https://levelup.gitconnected.com/unit-testing-in-python-mocking-patching-and-dependency-injection-301280db2fed</a> )
YouTube	Corey Schafer: Unit Testing Your Code with the unittest Module (	<a href="https://www.youtube.com/watch?v=6tNS--WetLI">https://www.youtube.com/watch?v=6tNS--WetLI</a> )

ArjanCodes: Test-Driven Development <https://www.youtube.com/watch?v=B1j6k2j2eJg> )  
 YouTube In Python ( )

Python Simplified: Python TDD Workflow - <https://www.youtube.com/watch?v=ibVSPVz2LAA> )  
 YouTube Unit Testing Code Example for Beginners ( )

## Python - Communication with APIs:

An API is an interface that software developers use to program interaction with software components or features outside their own code. An even simpler definition is that an API is the part of a software component that is accessible to other components.

Understanding what a REST API is

Knowing the basic HTTP communication commands

Understanding what a REST API is

Knowing how to make authenticated requests

Converting objects to JSON and vice-versa

Knowing how to use the tools of the Requests package

## Contents

Documentation - Requests: HTTP <https://requests.readthedocs.io/en/latest/> )  
 WebSite for Humans ( )

How To Get Started <https://www.digitalocean.com/community/tutorials/how-to-get-started-with-the-requests-library-in-python> )  
 ArticleWith the Requests Library in Python ( )

Python Requests Tutorial — GET and <https://medium.com/edureka/python-requests-tutorial-30edabfa6a1c> )  
 ArticlePOST Requests in Python ( )

How to Pull Data from an <https://towardsdatascience.com/how-to-pull-data-from-an-api-using-python-requests-edcc8d6441b1> )  
 ArticleAPI using Python Requests ( )

Corey Schafer: Python Requests Tutorial - <https://www.youtube.com/watch?v=tb8gHvYICFs> )  
 YouTubeRequest Web Pages, Download Images, POST Data, Read JSON, and More ( )

NeuralNine: Requests Library in Python - <https://www.youtube.com/watch?v=Xi1F2ZMAZ7Q> )  
 YouTubeBeginner Crash Course ( )

## Level 2

### Flask:

Flask is a micro web framework written in Python. It is classified as a microframework because it does not require particular tools or libraries. It has no database abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions. However, Flask supports extensions that can add application features as if they were implemented in Flask itself.

Creating web applications

Defining routes, redirects and templates

Validating forms

### Contents

WebSiteDocumentation Flask (<https://flask.palletsprojects.com/en/2.2.x/>)

	GeeksForGeeks: Python	<a href="https://www.geeksforgeeks.org/python-introduction-to-web-development-using-flask/">https://www.geeksforgeeks.org/python-introduction-to-web-development-using-flask/</a>	)
WebSite	Introduction to Web development using Flask (	<a href="https://www.geeksforgeeks.org/python-introduction-to-web-development-using-flask/">https://www.geeksforgeeks.org/python-introduction-to-web-development-using-flask/</a>	)
Article	Deploying a Python Flask app on Heroku (	<a href="https://medium.com/the-andela-way/deploying-a-python-flask-app-to-heroku-41250bda27d0">https://medium.com/the-andela-way/deploying-a-python-flask-app-to-heroku-41250bda27d0</a>	)
YouTube	freeCodeCamp.org: Learn Flask for Python - Full Tutorial (	<a href="https://www.youtube.com/watch?v=Z1RJmh_OqeA">https://www.youtube.com/watch?v=Z1RJmh_OqeA</a>	)
YouTube	NetworkChuck: build a meme Python website (Flask Tutorial for Beginners) (	<a href="https://www.youtube.com/watch?v=5aYpkLfkgRE">https://www.youtube.com/watch?v=5aYpkLfkgRE</a>	)
YouTube	DigitalOcean: Getting Started With Flask   1-Hour Tech Talk (	<a href="https://www.youtube.com/watch?v=bB6Yyh7nUI4">https://www.youtube.com/watch?v=bB6Yyh7nUI4</a>	)

### Python - Advanced OOP:

Mixin is a class that provides implementations of methods for reuse by multiple related child classes.

Operator overloading means giving extended meaning beyond its predefined operational meaning.

### Contents

Article	Python Multiple Inheritance — Python MRO (Method Resolution Order) in 1 minute (	<a href="https://blog.koladev.xyz/python-multiple-inheritance-python-mro-method-resolution-order-in-1-minute-2793e3e1cd20">https://blog.koladev.xyz/python-multiple-inheritance-python-mro-method-resolution-order-in-1-minute-2793e3e1cd20</a>	)
Article	Mixins for Fun and Profit (	<a href="https://easyaspython.com/mixins-for-fun-and-profit-cb9962760556">https://easyaspython.com/mixins-for-fun-and-profit-cb9962760556</a>	)
Article	Multiple inheritance and mixin classes in Python (	<a href="https://www.thedigitalcatonline.com/blog/2020/03/27/mixin-classes-in-python/">https://www.thedigitalcatonline.com/blog/2020/03/27/mixin-classes-in-python/</a>	)
WebSite	GeeksForGeeks: Operator Overloading in Python (	<a href="https://www.geeksforgeeks.org/operator-overloading-in-python/">https://www.geeksforgeeks.org/operator-overloading-in-python/</a>	)
YouTube	Python for Everyone: Mixins in Python (	<a href="https://www.youtube.com/watch?v=zNPaqZUTzs0">https://www.youtube.com/watch?v=zNPaqZUTzs0</a>	)
YouTube	Python for Everyone: Operator Overloading in Python (	<a href="https://www.youtube.com/watch?v=7fNj4Tqbymg">https://www.youtube.com/watch?v=7fNj4Tqbymg</a>	)

## Django:

Django is a high-level Python web framework that enables rapid development of secure and maintainable websites.

Creating web applications

Understanding the architecture of an application made with Django

Creating a page admin

Using templates and routes

Creating forms

Writing views

## Contents

WebSite	Documentation: Django	( <a href="https://docs.djangoproject.com/en/4.1/">https://docs.djangoproject.com/en/4.1/</a> )	
WebSite	MDN Web Docs: Django introduction	( <a href="https://developer.mozilla.org/en-US/docs/Learn/Server-side/Django/Introduction">https://developer.mozilla.org/en-US/docs/Learn/Server-side/Django/Introduction</a> )	
WebSite	GeeksForGeeks: Django Tutorial	( <a href="https://www.geeksforgeeks.org/django-tutorial/">https://www.geeksforgeeks.org/django-tutorial/</a> )	



Django Tutorial: Building and Securing Web Applications ( <https://medium.com/@auth0/django-tutorial-building-and-securing-web-applications-29fffe389843> )

YouTube Programming with Mosh: Python Django Tutorial for Beginners ( <https://www.youtube.com/watch?v=rHux0gMZ3Eg> )

YouTube freeCodeCamp.org: Python Django Web Framework - Full Course for Beginners ( <https://www.youtube.com/watch?v=F5mRW0jo-U4> )

## Django Rest Framework:

Django REST framework is a powerful and flexible toolkit for building Web APIs.

Developing APIs

Working with models, serializers and views

Including filters, searches and sorting

Limiting the number of requests

### Contents

WebSite Documentação Django Rest Framework ( <https://www.django-rest-framework.org/> )

WebSite JavaTPoint: Create REST API using Django REST Framework ( <https://www.javatpoint.com/create-rest-api-using-django-rest-framework> )

Article How to Develop APIs with Django REST Framework ( <https://djangostars.com/blog/rest-apis-django-development/> )

YouTube freeCodeCamp.org: Django REST Framework Course – Build Web APIs with Python ( <https://www.youtube.com/watch?v=tujhGdn1EMI> )

YouTube CodingEntrepreneurs: Build a Django REST API with the Django Rest Framework - Complete Tutorial ( <https://www.youtube.com/watch?v=c708Nf0cHrs> )

## Python - MVC and MTV:

MVC and MTV are two design patterns used for implementing web interfaces and applications.

Understanding the MVC pattern

Understanding the MTV pattern

Understanding the difference between the MVC and MTV patterns

## Contents

GeeksForGeeks: Difference WebSitebetween MVC and MVT design patterns (	<a href="https://www.geeksforgeeks.org/difference-between-mvc-and-mvt-design-patterns/">https://www.geeksforgeeks.org/difference-between-mvc-and-mvt-design-patterns/</a> )
freeCodeCamp.org: The Model WebSiteView Controller Pattern – MVC Architecture and Frameworks Explained (	<a href="https://www.freecodecamp.org/news/the-model-view-controller-pattern-mvc-architecture-and-frameworks-explained/">https://www.freecodecamp.org/news/the-model-view-controller-pattern-mvc-architecture-and-frameworks-explained/</a> )
Working Structure of ArticleDjango MTV Architecture (	<a href="https://towardsdatascience.com/working-structure-of-django-mtv-architecture-a741c8c64082">https://towardsdatascience.com/working-structure-of-django-mtv-architecture-a741c8c64082</a> )
Web Dev Simplified: MVC Explained YouTubein 4 Minutes (	<a href="https://www.youtube.com/watch?v=DUG2SWWK18I">https://www.youtube.com/watch?v=DUG2SWWK18I</a> )
Code Stack: How Django Works YouTube(MVT Pattern) (	<a href="https://www.youtube.com/watch?v=cyP4Uw2b2XM">https://www.youtube.com/watch?v=cyP4Uw2b2XM</a> )

## Python - Lambdas and Closures:

Lambda functions are nothing more than anonymous functions. While normal functions can be created using def as a prefix, lambda functions are created using lambda.

A closure in Python is an inner function object, a function that behaves like an object, that remembers and has access to variables in the local scope where it was created, even after the outer function has finished executing. It can also be defined as a means of binding data to a function without passing it as a parameter.

## Contents

W3Schools: Python WebSiteLambda (	<a href="https://www.w3schools.com/python/python_lambda.asp">https://www.w3schools.com/python/python_lambda.asp</a> )
GeeksForGeeks: Python WebSiteLambda Functions (	<a href="https://www.geeksforgeeks.org/python-lambda-anonymous-functions-filter-map-reduce/">https://www.geeksforgeeks.org/python-lambda-anonymous-functions-filter-map-reduce/</a> )
GeeksForGeeks: Python WebSiteClosures (	<a href="https://www.geeksforgeeks.org/python-closures/">https://www.geeksforgeeks.org/python-closures/</a> )

WebSitelearnpython.org: Closures (<https://www.learnpython.org/en/Closures>)

YouTube Socratica: Lambda Expressions & Anonymous Functions || Python Tutorial ( <https://www.youtube.com/watch?v=25ovCm9jKfA> )

YouTube Sreekanth: Closures in Python | Explained with animations ( <https://www.youtube.com/watch?v=tNSOaA1z6Uo> )

YouTube Corey Schafer: Closures - How to Use Them and Why They Are Useful ( <https://www.youtube.com/watch?v=swU3c34d2NQ> )

## Level 3

### Microservices architecture:

Microservices are an architectural approach in which software consists of small independent services that communicate with each other and are organized according to their business domains.

Learning the concept of planned architecture for microservices

Performing communication using APIs

Improving the scalability of a system

### Contents

Google Cloud: <https://learn.microsoft.com/en-us/azure/architecture/guide/architecture-styles/microservices>  
WebSiteMicroservice architecture style ( )

Amazon: What are microservices? ( <https://aws.amazon.com/en/microservices/> )

The What, Why, and How of a Microservices Architecture ( <https://medium.com/hashmapinc/the-what-why-and-how-of-a-microservices-architecture-4179579423a9> )

Understanding Microservices: From Idea To Starting Line ( <https://medium.com/free-code-camp/microservices-from-idea-to-starting-line-ae5317a6ff02> )

YouTube TechWorld with Nana: Microservices explained - the What, Why and How? ( <https://www.youtube.com/watch?v=rv4LlmLmVWk> )

ByteByteGo: What Are Microservices  
 YouTubeReally All About? (And When Not To Use It) ([https://www.youtube.com/watch?v=\\_Oyy5PFOlcU](https://www.youtube.com/watch?v=_Oyy5PFOlcU))

InfoQ: Mastering Chaos - A Netflix Guide to Microservices (<https://www.youtube.com/watch?v=CZ3wluvmHeM>)

freeCodeCamp.org: Microservice  
 YouTubeArchitecture and System Design with Python & Kubernetes – Full Course (<https://www.youtube.com/watch?v=hmkF77F9TLw>)

## Containers:

Containers are software packages that contain all the elements needed to run in any environment.

Kubernetes (also known as k8s or “kube”) is an open source container orchestration platform that automates many of the manual processes involved in deploying, managing, and scaling containerized applications.

Isolating your software to run independently

Deploying software in clusters

Modularizing your system into smaller packages

Getting to know the Docker platform

Getting to know Kubernetes

## Contents

WebSiteIBM: Containers (<https://www.ibm.com/en-us/cloud/learn/containers>)

WebSiteHPE: What are containers? (<https://www.hpe.com/us/en/what-is/containers.html>)

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WebSiteKubernetes - Documentation (<https://kubernetes.io/docs/tutorials/kubernetes-basics/>)

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Article	Azure: What is Kubernetes? (	<a href="https://azure.microsoft.com/en-us/topic/what-is-kubernetes/">https://azure.microsoft.com/en-us/topic/what-is-kubernetes/</a>	)
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YouTube	freeCodeCamp.org: Docker Containers and Kubernetes Fundamentals – Full Hands-On Course (	<a href="https://www.youtube.com/watch?v=kTp5xUtcaw">https://www.youtube.com/watch?v=kTp5xUtcaw</a>	)
YouTube	TechWorld with Nana: Kubernetes Tutorial for Beginners [FULL COURSE in 4 Hours] (	<a href="https://www.youtube.com/watch?v=X48VuDVv0do">https://www.youtube.com/watch?v=X48VuDVv0do</a>	)

## Python - Static typing:

Python is a dynamically typed language, that is, there is no need to think about data types. Statically typed languages (such as C or Java) perform type checks upon compilation. It may feel safer, as you can immediately tell the type of parameter going into each function.

Getting to know type hinting

### Contents

Article	How to Make Python Statically Typed —The Essential Guide (	<a href="https://betterdatascience.com/python-statically-typed/">https://betterdatascience.com/python-statically-typed/</a>	)
Article	Data Science: Write Robust Python With Static Typing (	<a href="https://towardsdatascience.com/data-science-write-robust-python-with-static-typing-c71b9c9c8044">https://towardsdatascience.com/data-science-write-robust-python-with-static-typing-c71b9c9c8044</a>	)
YouTube	Tech With Tim: Python Typing - Type Hints & Annotations (	<a href="https://www.youtube.com/watch?v=QORvB-_mbZ0">https://www.youtube.com/watch?v=QORvB-_mbZ0</a>	)
YouTube	NeuralNine: Type Hinting - Advanced Python Tutorial (	<a href="https://www.youtube.com/watch?v=6KidYEtsPNc">https://www.youtube.com/watch?v=6KidYEtsPNc</a>	)
YouTube	PyGotham 2019: Static Typing in Python (	<a href="https://www.youtube.com/watch?v=2gBP1qN5T7I">https://www.youtube.com/watch?v=2gBP1qN5T7I</a>	)

## Python - Generators:

Generator functions allow you to declare a function that behaves like an iterator, for example, it can be used in a 'for' loop.

Creating iterative objects

Using lazy evaluation

Running concurrent tasks

Using the reserved word 'yield'

## Contents

WebSite Wiki Python: Generators (<https://wiki.python.org/moin/Generators>)

WebSite Real Python: How to Use Generators <https://realpython.com/introduction-to-python-generators/> )  
and yield in Python (

Article Python <https://towardsdatascience.com/python-generators-393455aa48a3> )  
Generators (

YouTube Corey Schafer: Generators - How to use [https://www.youtube.com/watch?v=bD05uGo\\_sVI](https://www.youtube.com/watch?v=bD05uGo_sVI) )  
them and the benefits you receive (

YouTube Tech With Tim: Python Generators <https://www.youtube.com/watch?v=u3T7hmLthUU> )  
Explained (

## Python - Asynchronous:

In asynchronous programming, the functions are not executed in order. We can interrupt the code to get some other information needed to continue execution. This means that the code waits for another part of the code, and while it waits, it can execute the other parts.

Learning about coroutines

Coroutines are a generalization of subroutines. They are used for cooperative multitasking where a process yields control voluntarily, periodically or when idle, in order to allow multiple applications to run simultaneously.

Dealing with concurrency

Knowing the concept of waitable objects

Creating concurrent tasks

Knowing the 'asyncio' library

## Contents

WebSite Documentation: <https://docs.python.org/3.8/library/asyncio-task.html> )  
Coroutines (

WebSite	Real Python: Async IO in Python - A Complete Walkthrough (	<a href="https://realpython.com/async-io-python/">https://realpython.com/async-io-python/</a> )
WebSite	Super Fast Python: Asynchronous Programming in Python (	<a href="https://superfastpython.com/python-asynchronous-programming/">https://superfastpython.com/python-asynchronous-programming/</a> )
Article	An Introduction to Asynchronous Programming in Python (	<a href="https://medium.com/velotio-perspectives/an-introduction-to-asynchronous-programming-in-python-af0189a88bbb">https://medium.com/velotio-perspectives/an-introduction-to-asynchronous-programming-in-python-af0189a88bbb</a> )
YouTube	Tech With Tim: Python Asynchronous Programming - AsyncIO & Async/Await (	<a href="https://www.youtube.com/watch?v=t5Bo1Je9EmE">https://www.youtube.com/watch?v=t5Bo1Je9EmE</a> )
YouTube	NeuralNine: AsyncIO & Asynchronous Programming in Python (	<a href="https://www.youtube.com/watch?v=6RbJYN7SoRs">https://www.youtube.com/watch?v=6RbJYN7SoRs</a> )
YouTube	mCoding: Intro to async Python   Writing a Web Crawler (	<a href="https://www.youtube.com/watch?v=ftmdDIwMwwQ">https://www.youtube.com/watch?v=ftmdDIwMwwQ</a> )

## Python - args & kwargs:

The magic variables `*args` and `**kwargs` are commonly used in function definitions, and are used to pass an unknown number of arguments to a function.

Understanding the difference between `*args` and `**kwargs`

### Contents

WebSite	Real Python: Python args and kwargs demystified (	<a href="https://realpython.com/python-kwargs-and-args/">https://realpython.com/python-kwargs-and-args/</a> )
WebSite	GeeksForGeeks: <code>*args</code> and <code>**kwargs</code> in Python (	<a href="https://www.geeksforgeeks.org/args-kwargs-python/">https://www.geeksforgeeks.org/args-kwargs-python/</a> )
YouTube	CodingEntrepreneurs: But what are Python <code>*ARGS</code> and <code>**KWARGS</code> ? (	<a href="https://www.youtube.com/watch?v=GdSJAZDsCZA">https://www.youtube.com/watch?v=GdSJAZDsCZA</a> )
YouTube	John Watson Rooney: Why <code>*ARGS</code> and <code>**KWARGS</code> are Useful in Python (	<a href="https://www.youtube.com/watch?v=G7gZKANSmqk">https://www.youtube.com/watch?v=G7gZKANSmqk</a> )

## Python - Dunder methods:

Special methods or magic methods in Python are methods that are predefined in all objects, with automatic invocation under special circumstances. They are usually not called directly by the user but can be overloaded (overwritten and changed). Their

names begin and end with double underscores called 'dunder' (an expression derived from double underscore).

Understanding the concept of special (or magic) methods

Knowing the main magic methods and how to use them

## Contents

WebSite	GeeksForGeeks: Dunder or magic methods in Python (	<a href="https://www.geeksforgeeks.org/dunder-magic-methods-python/">https://www.geeksforgeeks.org/dunder-magic-methods-python/</a>	)
Article	Dunder/Magic Methods in Python (	<a href="https://www.section.io/engineering-education/dunder-methods-python/">https://www.section.io/engineering-education/dunder-methods-python/</a>	)
Article	A Guide To Python's Dunder Methods (	<a href="https://towardsdatascience.com/a-guide-to-pythons-dunder-methods-3b8104fce335">https://towardsdatascience.com/a-guide-to-pythons-dunder-methods-3b8104fce335</a>	)
YouTube	Corey Schafer: Special (Magic/Dunder) Methods (	<a href="https://www.youtube.com/watch?v=3ohzBxoFHAY">https://www.youtube.com/watch?v=3ohzBxoFHAY</a>	)
YouTube	Tech With Tim: Dunder/Magic Methods & The Python Data Model (	<a href="https://www.youtube.com/watch?v=yxUm_QnP4Qo">https://www.youtube.com/watch?v=yxUm_QnP4Qo</a>	)
YouTube	NeuralNine: Magic Methods & Dunder (	<a href="https://www.youtube.com/watch?v=KSIRzuSx120">https://www.youtube.com/watch?v=KSIRzuSx120</a>	)

## Python - Metaprogramming:

Metaprogramming is a programming technique in which computer programs have the ability to treat other programs as their data. It means that a program can be designed to read, generate, analyze or transform other programs, and even modify itself while running.

Writing a program that manipulates other programs

Using metaclasses

## Contents

WebSite	GeeksForGeeks: Metaprogramming with Metaclasses in Python (	<a href="https://acervolima.com/metaprogramacao-com-metaclasses-em-python/">https://acervolima.com/metaprogramacao-com-metaclasses-em-python/</a>	)
WebSite	Real Python: Python Metaclasses (	<a href="https://realpython.com/python-metaclasses/">https://realpython.com/python-metaclasses/</a>	)



Article	Advanced Python: Metaprogramming (	<a href="https://medium.com/fintechexplained/advanced-python-metaprogramming-980da1be0c7d">https://medium.com/fintechexplained/advanced-python-metaprogramming-980da1be0c7d</a>	)
YouTube	Tech With Tim: Metaclasses & How Classes Really Work (	<a href="https://www.youtube.com/watch?v=NAQEj-c2CI8">https://www.youtube.com/watch?v=NAQEj-c2CI8</a>	)
YouTube	edutechional: A Practical Guide to Metaprogramming (	<a href="https://www.youtube.com/watch?v=IZfv4H-9ato">https://www.youtube.com/watch?v=IZfv4H-9ato</a>	)

## Python - Multiprocessing:

In Python, the multiprocessing module includes a very simple and intuitive API for dividing up work among multiple processes.

Running processes in parallel

Getting to know the Pool class

### Contents

WebSite	Documentation: multiprocessing (	<a href="https://docs.python.org/3/library/multiprocessing.html">https://docs.python.org/3/library/multiprocessing.html</a> )
WebSite	Documentation: Process Pools (	<a href="https://docs.python.org/3/library/multiprocessing.html#module-multiprocessing.pool">https://docs.python.org/3/library/multiprocessing.html#module-multiprocessing.pool</a> )
WebSite	Super Fast Python: Python Multiprocessing Pool - The Complete Guide (	<a href="https://superfastpython.com/multiprocessing-pool-python/">https://superfastpython.com/multiprocessing-pool-python/</a> )
WebSite	Digital Ocean: Python Multiprocessing Example (	<a href="https://www.digitalocean.com/community/tutorials/python-multiprocessing-example">https://www.digitalocean.com/community/tutorials/python-multiprocessing-example</a> )
Article	Demystifying Python Multiprocessing and Multithreading (	<a href="https://towardsdatascience.com/demystifying-python-multiprocessing-and-multithreading-9b62f9875a27">https://towardsdatascience.com/demystifying-python-multiprocessing-and-multithreading-9b62f9875a27</a> )
YouTube	Corey Schafer: Python Multiprocessing Tutorial - Run Code in Parallel Using the Multiprocessing Module (	<a href="https://www.youtube.com/watch?v=fKI2JW_qrso">https://www.youtube.com/watch?v=fKI2JW_qrso</a> )
YouTube	NeuralNine: Multiprocessing in Python (	<a href="https://www.youtube.com/watch?v=GT10PnUFLIE">https://www.youtube.com/watch?v=GT10PnUFLIE</a> )

## Reflection and attributes:

Reflection objects are used for obtaining type information at runtime. The classes that give access to the metadata of a running program are in the System.Reflection namespace.

Writing code that reads object information and metadata at runtime

Getting class names at runtime and creating objects of a class

### Contents

WebSite	Microsoft Docs: Reflection (C#) (	<a href="https://learn.microsoft.com/en-us/dotnet/csharp/programming-guide/concepts/reflection">https://learn.microsoft.com/en-us/dotnet/csharp/programming-guide/concepts/reflection</a>	)
WebSite	GeeksforGeeks: Reflection in Python (	<a href="https://www.geeksforgeeks.org/reflection-in-python/">https://www.geeksforgeeks.org/reflection-in-python/</a>	)
Article	Reflection in C# (	<a href="https://medium.com/@ghadeer.kenawi/reflection-in-c-fa27d8f827f8">https://medium.com/@ghadeer.kenawi/reflection-in-c-fa27d8f827f8</a>	)
Article	C# - Reflection (	<a href="https://www.tutorialspoint.com/csharp/csharp_reflection.htm">https://www.tutorialspoint.com/csharp/csharp_reflection.htm</a>	)
YouTube	Raw Coding: C# Reflection Explained (	<a href="https://www.youtube.com/watch?v=cdG2JxuZvNI">https://www.youtube.com/watch?v=cdG2JxuZvNI</a>	)
YouTube	Tutorials Point: C# - Reflection (	<a href="https://www.youtube.com/watch?v=wfDFI9A56Gs">https://www.youtube.com/watch?v=wfDFI9A56Gs</a>	)
YouTube	Derek Banas: Java Reflection Tutorial (	<a href="https://www.youtube.com/watch?v=agnbIS47F18">https://www.youtube.com/watch?v=agnbIS47F18</a>	)

## Auxiliary Skill: Infrastructure

### Git & GitHub - Fundamentals:

Git is a free and open source distributed version control system designed to handle everything from small to very large projects with speed and efficiency.

GitHub is a hosting service for software development and version control using Git.

Creating a repository

Cloning a repository

Committing, pushing and pulling to and from the repository

Reversing a commit

Creating branches and pull requests

Handling merge and conflicts

## Contents

WebSiteGit Reference Book (<https://git-scm.com/book/en/v2>)

WebSiteGitHub Documentation (<https://docs.github.com/en>)

WebSiteGitHub Pages Documentation ( <https://docs.github.com/en/pages/getting-started-with-github-pages/about-github-pages> )

WebSiteW3Schools: Git Tutorial ( <https://www.w3schools.com/git/default.asp?remote=github> )

WebSiteGit School - Visualizing Git (<https://git-school.github.io/visualizing-git/>)

WebSiteDangit, Git!?! (<https://dangitgit.com/>)

ArticleGit Tutorial - Explore The Commands And Operations In Git ( <https://medium.com/edureka/git-tutorial-da652b566ece> )

ArticleGit and Github Quickstart Tutorial ( <https://medium.com/@prashantramnyc/git-and-github-quickstart-tutorial-654a71594dca> )

ArticleGetting Started with Git and GitHub: A Complete Tutorial for Beginner ( <https://towardsdatascience.com/learn-basic-git-commands-for-your-data-science-works-2a75396d530d> )

YouTubeProgramming with Mosh: Git Tutorial for Beginners - Learn Git in 1 Hour ( <https://www.youtube.com/watch?v=8JJ101D3knE> )

YouTubefreeCodeCamp.org: Git and GitHub for Beginners - Crash Course ( <https://www.youtube.com/watch?v=RGQj5yH7evk> )

YouTubeKevin Stratvert: Git and GitHub for Beginners Tutorial ( <https://www.youtube.com/watch?v=tRZGeaHPoaw> )

YouTubeTech With Tim: Git Tutorial for Beginners - Git & GitHub Fundamentals In Depth ( <https://www.youtube.com/watch?v=DVRQoVRzMIY> )

## HTTP - Fundamentals:

HTTP stands for Hyper Text Transfer Protocol. Communication between client computers and web servers is done by sending HTTP Requests and receiving HTTP

Responses.

Understanding the difference between HTTP verbs

Testing requests and checking the status codes in the browser

Learning how to make a HTTP request on the command line with WGET

Downloading an image with WGET

Performing a POST

## Contents

WebSite	W3Schools: What is HTTP? (	<a href="https://www.w3schools.com/whatis/whatis_http.asp">https://www.w3schools.com/whatis/whatis_http.asp</a> )
WebSite	MDN Web Docs: An overview of HTTP (	<a href="https://developer.mozilla.org/en-US/docs/Web/HTTP/Overview">https://developer.mozilla.org/en-US/docs/Web/HTTP/Overview</a> )
WebSite	MDN Web Docs: HTTP request methods (	<a href="https://developer.mozilla.org/en-US/docs/Web/HTTP/Methods">https://developer.mozilla.org/en-US/docs/Web/HTTP/Methods</a> )
WebSite	HTTP Cats (	<a href="https://http.cat/">https://http.cat/</a> )
WebSite	HTTP Dogs (	<a href="https://http.dog/">https://http.dog/</a> )
Article	HTTP codes as Valentine's Day comics (	<a href="https://medium.com/@hanilim/http-codes-as-valentines-day-comics-8c03c805faa0">https://medium.com/@hanilim/http-codes-as-valentines-day-comics-8c03c805faa0</a> )
Article	Here Are the most popular ways to make an HTTP request in JavaScript (	<a href="https://medium.com/free-code-camp/here-is-the-most-popular-ways-to-make-an-http-request-in-javascript-954ce8c95aaa">https://medium.com/free-code-camp/here-is-the-most-popular-ways-to-make-an-http-request-in-javascript-954ce8c95aaa</a> )
YouTube	Traversy Media: HTTP Crash Course & Exploration (	<a href="https://www.youtube.com/watch?v=iYM2zFP3Zn0">https://www.youtube.com/watch?v=iYM2zFP3Zn0</a> )
YouTube	Curious Code: HTTP Request Methods - GET, POST, PUT, DELETE (	<a href="https://www.youtube.com/watch?v=tkfVQK6UxDI">https://www.youtube.com/watch?v=tkfVQK6UxDI</a> )
YouTube	freeCodeCamp.org: Postman Beginner's Course - API Testing (	<a href="https://www.youtube.com/watch?v=VywxIQ2ZXw4">https://www.youtube.com/watch?v=VywxIQ2ZXw4</a> )

## JSON:

JSON stands for JavaScript Object Notation. It is a text format for storing and transporting data.

Creating an object

Transforming an object into a string

Transforming a string into an object

Manipulating an object

## Contents

WebSiteW3Schools: JSON ([https://www.w3schools.com/js/js\\_json\\_intro.asp](https://www.w3schools.com/js/js_json_intro.asp))

WebSiteMDN Web Docs: JSON ([https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global\\_Objects/JSON](https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/JSON))

WebSiteMDN Web Docs: Working with JSON (<https://developer.mozilla.org/en-US/docs/Learn/JavaScript/Objects/JSON>)

YouTubeWeb Dev Simplified: Learn JSON in 10 Minutes (<https://www.youtube.com/watch?v=iiADhChRriM>)

YouTubeTraversy Media: JSON Crash Course (<https://www.youtube.com/watch?v=w1CWzNtE-M>)

## Command Line - Fundamentals:

CLI is a command line program that accepts text input to execute operating system functions.

Knowing the most important commands

## Contents

WebSiteW3Schools: What is Command Line Interface (CLI)? ([https://www.w3schools.com/whatis/whatis\\_cli.asp](https://www.w3schools.com/whatis/whatis_cli.asp))

WebSiteMicrosoft Docs: Using command line arguments for Windows Terminal (<https://docs.microsoft.com/en-us/windows/terminal/command-line-arguments?tabs=windows>)

ArticleAdvanced CLI: Commands You Should Know as a Developer (<https://betterprogramming.pub/advanced-cli-commands-you-should-know-as-a-developer-7bc48c752a5e>)

YouTubefreeCodeCamp.org: Command Line Crash Course (<https://www.youtube.com/watch?v=yz7nYlnXLfE>)

YouTubeTraversy Media: Command Line Crash Course For Beginners - Terminal

Commands (

<https://www.youtube.com/watch?v=uwAqEzhyjtw>

## Cloud - Fundamentals:

Cloud, or cloud computing, is the distribution of computing services over the Internet using a pay-as-you-go pricing model. A cloud is composed of various computing resources, ranging from the computers themselves (or instances, in cloud terminology) to networks, storage, databases, and everything around them. In other words, everything that is normally needed to set up the equivalent of a server room, or even a complete data center, will be ready to use, configured, and run.

Knowing the difference between IaaS, PaaS and SaaS

Knowing the largest cloud providers

Specializing in a specific provider of your choice

## Contents

WebSite	Microsoft Azure: What is cloud computing? (	<a href="https://azure.microsoft.com/en-us/resources/cloud-computing-dictionary/what-is-cloud-computing/">https://azure.microsoft.com/en-us/resources/cloud-computing-dictionary/what-is-cloud-computing/</a> )
WebSite	Amazon AWS: What is cloud computing? (	<a href="https://aws.amazon.com/en/what-is-cloud-computing/">https://aws.amazon.com/en/what-is-cloud-computing/</a> )
Article	A beginner's guide to the basics of what cloud computing is about (	<a href="https://scientya.com/a-beginners-guide-to-the-basics-of-what-cloud-computing-is-about-e8b3b7f25a30/">https://scientya.com/a-beginners-guide-to-the-basics-of-what-cloud-computing-is-about-e8b3b7f25a30/</a> )
Article	Cloud Computing for Beginners (	<a href="https://medium.com/hackernoon/cloud-computing-for-beginners-85d168959afb/">https://medium.com/hackernoon/cloud-computing-for-beginners-85d168959afb/</a> )
Article	What are Cloud Computing Services [IaaS, CaaS, PaaS, FaaS, SaaS] (	<a href="https://medium.com/@nnilesh7756/what-are-cloud-computing-services-iaas-caas-paas-faas-saas-ac0f6022d36e">https://medium.com/@nnilesh7756/what-are-cloud-computing-services-iaas-caas-paas-faas-saas-ac0f6022d36e</a> )
YouTube	Simplilearn: Cloud Computing Tutorial for Beginners (	<a href="https://www.youtube.com/watch?v=RWgW-CgdIk0">https://www.youtube.com/watch?v=RWgW-CgdIk0</a> )
YouTube	Amazon Web Services: What is Cloud Computing? - Amazon Web Services (	<a href="https://www.youtube.com/watch?v=mxT233EdY5c">https://www.youtube.com/watch?v=mxT233EdY5c</a> )
YouTube	Ecourse Review: Cloud Computing Services Models - IaaS PaaS SaaS Explained (	<a href="https://www.youtube.com/watch?v=36zducUX16w/">https://www.youtube.com/watch?v=36zducUX16w/</a> )

## SQL - Fundamentals:

Structured Query Language (SQL) is a standardized programming language that is used to manage relational databases and perform various operations on the data in them.

Knowing the most common SQL commands

Using SELECT to query a table

Using INSERT to insert data into a table

Using UPDATE to update a table

Using DELETE to remove data from a table

Using JOIN to connect data from multiple tables

Knowing the clauses (FROM, ORDER BY, etc.)

### Contents

WebSite W3Schools: Introduction to SQL ( [https://www.w3schools.com/sql/sql\\_intro.asp](https://www.w3schools.com/sql/sql_intro.asp))

WebSite Amazon AWS: What is SQL? ( [https://aws.amazon.com/what-is/sql/?nc1=h\\_ls](https://aws.amazon.com/what-is/sql/?nc1=h_ls))

Article From Basic to Intermediate SQL in 10 Minutes ( <https://medium.com/analytics-vidhya/from-basic-to-intermediate-sql-in-10-minutes-42b960ed6f9e>)

Article SQL for Beginners 2022 — A Practical SQL Guide ( <https://medium.com/@besimum/sql-for-beginners-2022-a-practical-sql-guide-1de6adb43d52>)

YouTube Kevin Stratvert: SQL for Beginners Tutorial ( <https://www.youtube.com/watch?v=h0nxCDiD-zg>)

YouTube Fireship: Learn SQL in 23 Easy Steps ( <https://www.youtube.com/watch?v=Cz3WcZLRaWc>)

YouTube freeCodeCamp.org: SQL Tutorial - Full Database Course for Beginners ( <https://www.youtube.com/watch?v=HXV3zeQKqGY>)

## Auxiliary Skill: Good practices and tools

### SOLID:

SOLID has five principles that are considered best practices in software development that help programmers write cleaner code by separating responsibilities, reducing coupling, easing refactoring, and encouraging code reuse.

#### Contents

The S.O.L.I.D	
Article Principles in Pictures (	<a href="https://medium.com/backticks-tildes/the-s-o-l-i-d-principles-in-pictures-b34ce2f1e898">https://medium.com/backticks-tildes/the-s-o-l-i-d-principles-in-pictures-b34ce2f1e898</a> )
Article SOLID Principles every Developer Should Know (	<a href="https://blog.bitsrc.io/solid-principles-every-developer-should-know-b3bfa96bb688">https://blog.bitsrc.io/solid-principles-every-developer-should-know-b3bfa96bb688</a> )
YouTube Fireship: Solid in 100 Seconds (	<a href="https://www.youtube.com/watch?v=q0BGgQJcp7w">https://www.youtube.com/watch?v=q0BGgQJcp7w</a> )
YouTube A Dev' Story: SOLID Design Principles Explained in a Nutshell (	<a href="https://www.youtube.com/watch?v=69sfWNzxTmc">https://www.youtube.com/watch?v=69sfWNzxTmc</a> )
YouTube Web Dev Simplified: Single Responsibility Principle Explained - SOLID Design Principles (	<a href="https://www.youtube.com/watch?v=UQqY3_6Epbg">https://www.youtube.com/watch?v=UQqY3_6Epbg</a> )

### Clean Architecture:

Clean architecture is a way of developing software, such that just by looking at the source code of a program, you should be able to tell what the program does.

#### Contents

Article The Clean Architecture—Beginner's Guide (	<a href="https://betterprogramming.pub/the-clean-architecture-beginners-guide-e4b7058c1165">https://betterprogramming.pub/the-clean-architecture-beginners-guide-e4b7058c1165</a> )
Article Thoughts on Clean Architecture (	<a href="https://medium.com/android-news/thoughts-on-clean-architecture-b8449d9d02df">https://medium.com/android-news/thoughts-on-clean-architecture-b8449d9d02df</a> )
Article Clean Architecture, the right way (	<a href="https://medium.com/gdg-vit/clean-architecture-the-right-way-d83b81ecac6">https://medium.com/gdg-vit/clean-architecture-the-right-way-d83b81ecac6</a> )
Article Why use a Clean Architecture (	<a href="https://www.mytaskpanel.com/the-5-advantages-of-using-a-clean-architecture-all-you-need-to-know/">https://www.mytaskpanel.com/the-5-advantages-of-using-a-clean-architecture-all-you-need-to-know/</a> )



Article	Clean Architecture – Build Software like an Artisan (	<a href="https://flexiple.com/developers/clean-architecture-build-software-like-an-artisan/">https://flexiple.com/developers/clean-architecture-build-software-like-an-artisan/</a> )
Article	React Clean Architecture (	<a href="https://kpiteng.medium.com/react-clean-architecture-e4144a0788b6">https://kpiteng.medium.com/react-clean-architecture-e4144a0788b6</a> )
Article	Clean Architecture with Java 11 (	<a href="https://medium.com/slalom-build/clean-architecture-with-java-11-f78bba431041">https://medium.com/slalom-build/clean-architecture-with-java-11-f78bba431041</a> )
Article	A detailed guide on developing Android apps using the Clean Architecture pattern (	<a href="https://medium.com/@dmilicic/a-detailed-guide-on-developing-android-apps-using-the-clean-architecture-pattern-d38d71e94029">https://medium.com/@dmilicic/a-detailed-guide-on-developing-android-apps-using-the-clean-architecture-pattern-d38d71e94029</a> )
YouTube	CodeOpinion: Clean Architecture Example & Breakdown (	<a href="https://www.youtube.com/watch?v=Ys_W6MyWOCw">https://www.youtube.com/watch?v=Ys_W6MyWOCw</a> )
YouTube	Women Who Code: Clean Architecture Concepts (	<a href="https://www.youtube.com/watch?v=ouBSPdzbzvw">https://www.youtube.com/watch?v=ouBSPdzbzvw</a> )
YouTube	CodandoTV(Rods) - Simplifying Clean Architecture +MVVM in your mobile application - COMPLETE GUIDE (	<a href="https://youtu.be/8ehIZfyN1S0?si=l7-l5l4zsnYLIjD">https://youtu.be/8ehIZfyN1S0?si=l7-l5l4zsnYLIjD</a> )

## Design Patterns:

In software engineering, a Design Pattern is a general, reusable solution to a commonly occurring problem within a given context in software design. It is a description or template for how to solve a problem that can be used in many different situations. Design Patterns are formalized best practices that the programmer can use to solve common problems when designing an application or system.

Getting familiarized with and applying the main Design Patterns

### Contents

WebSite	What's a design pattern? (	<a href="https://refactoring.guru/design-patterns/what-is-pattern">https://refactoring.guru/design-patterns/what-is-pattern</a> )
Article	Design Patterns — Introduction (	<a href="https://henriquesd.medium.com/design-patterns-introduction-220f811db857">https://henriquesd.medium.com/design-patterns-introduction-220f811db857</a> )
Article	What Are Design Patterns and Do I Need Them? (	<a href="https://www.developer.com/design/what-are-design-patterns-and-do-i-need-them/">https://www.developer.com/design/what-are-design-patterns-and-do-i-need-them/</a> )

The 3 Types of Design Patterns All Developers Should Know (with code examples of each) (	<a href="https://www.freecodecamp.org/news/the-basic-design-patterns-all-developers-need-to-know/">https://www.freecodecamp.org/news/the-basic-design-patterns-all-developers-need-to-know/</a>	)
10 Design Patterns every Software Architect and Software Engineer must know (	<a href="https://ravindraelicherla.medium.com/10-design-patterns-every-software-architect-must-know-b33237bc01c2">https://ravindraelicherla.medium.com/10-design-patterns-every-software-architect-must-know-b33237bc01c2</a>	)
Modern-Day Architecture Design Patterns for Software Professionals (	<a href="https://betterprogramming.pub/modern-day-architecture-design-patterns-for-software-professionals-9056ee1ed977">https://betterprogramming.pub/modern-day-architecture-design-patterns-for-software-professionals-9056ee1ed977</a>	)
Web Dev Simplified: Design Patterns (Playlist) (	<a href="https://www.youtube.com/playlist?list=PLZIA0Gpn_vH_CthENcPCM0Dww6a5XYC7f">https://www.youtube.com/playlist?list=PLZIA0Gpn_vH_CthENcPCM0Dww6a5XYC7f</a>	)
Programming with Mosh: Design Patterns in Plain English (	<a href="https://www.youtube.com/watch?v=NU_1StN5Tkk">https://www.youtube.com/watch?v=NU_1StN5Tkk</a>	)
Fireship: 10 Design Patterns Explained in 10 Minutes (	<a href="https://www.youtube.com/watch?v=tv-_1er1mWI">https://www.youtube.com/watch?v=tv-_1er1mWI</a>	)
Traversy Media: 5 Design Patterns Every Engineer Should Know (	<a href="https://www.YOUTUBE.com/watch?v=AWOf6Wo6gtg">https://www.YOUTUBE.com/watch?v=AWOf6Wo6gtg</a>	)

## Data Extraction and Processing:

Data extraction is the process of collecting or retrieving disparate types of data from a variety of sources, many of which may be poorly organized or completely unstructured.

Obtaining the data to be analyzed

Treating the obtained data, transforming it, changing its structure and values in order to make the database more coherent and ensure that the data to be worked on is in the best conditions to be analyzed

Using the Pandas and Scikit-learn libraries to treat the data

## Contents

Data Mining in Brief (	<a href="https://towardsdatascience.com/data-mining-in-brief-26483437f178">https://towardsdatascience.com/data-mining-in-brief-26483437f178</a>	)
Handy-Dandy Python Modules For Data Processing (	<a href="https://towardsdatascience.com/handy-dandy-python-modules-for-data-processing-3a85d6806d39">https://towardsdatascience.com/handy-dandy-python-modules-for-data-processing-3a85d6806d39</a>	)

YouTube	IBM Technology: What is Data Mining? (	<a href="https://www.youtube.com/watch?v=7rs0i-9nOjo">https://www.youtube.com/watch?v=7rs0i-9nOjo</a> )
YouTube	edureka!: Data Extraction Using Python (	<a href="https://www.youtube.com/watch?v=kEltYHtqQUg">https://www.youtube.com/watch?v=kEltYHtqQUg</a> )
YouTube	freeCodeCamp.org: Data Analysis with Python - Full Course for Beginners (Numpy, Pandas, Matplotlib, Seaborn) (	<a href="https://www.youtube.com/watch?v=r-uOLxNrNk8">https://www.youtube.com/watch?v=r-uOLxNrNk8</a> )

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