Python Topics -

GENERAL

1. Is python a dying language?

Quora: [ans](https://www.quora.com/Is-Python-a-dying-language-A-friend-of-my-grandmother%E2%80%99s-is-a-computer-scientist-from-MIT-He-told-me-that-I-should-not-learn-Python-because-its-a-dying-language-and-that-I-should-learn-Assembly-because-its-better-than-Python)

1. What is Python really? You can (and are encouraged) make comparisons to other technologies in your answer.

[CodeMentor: Q1](https://www.codementor.io/sheena/essential-python-interview-questions-du107ozr6)

1. As python is an interpreted language. So, what are the .pyc file in python and how they get generated?

Or

Explain the python architecture (Interpreter, compiler, PVM)?

Or

Explain the step in python source code execution? Or How python source code get converted to machine understandable code?

[python-course: architecture](https://www.python-course.eu/python3_execute_script.php) , [GeeksforGeeks: Internal working of python](https://www.geeksforgeeks.org/internal-working-of-python/)

1. How python manages memory? Or Describe Python's garbage collection mechanism in brief.

[CodeMentor: Q12](https://www.codementor.io/sheena/essential-python-interview-questions-du107ozr6)

1. What is the difference between python2 and python3?

[GeeksforGeeks: python2 vs python3](https://www.geeksforgeeks.org/important-differences-between-python-2-x-and-python-3-x-with-examples/), [learncodewithme: python2 vs python3](https://learntocodewith.me/programming/python/python-2-vs-python-3/#history-of-python2-vs-3)

1. What is ASCII, unicode and UTF-8 ? What is the difference between them?

[Mediam](https://medium.com/@apiltamang/unicode-utf-8-and-ascii-encodings-made-easy-5bfbe3a1c45a) , [Joel: Character set](https://www.joelonsoftware.com/2003/10/08/the-absolute-minimum-every-software-developer-absolutely-positively-must-know-about-unicode-and-character-sets-no-excuses/) , [Webpedia:ASCII](https://www.webopedia.com/TERM/A/ASCII.html) , [QUORA](https://www.quora.com/Can-you-tell-me-in-a-few-words-the-difference-between-Unicode-and-UTF-8) , [Stackoverflow](https://stackoverflow.com/questions/643694/what-is-the-difference-between-utf-8-and-unicode) , [UTF-8](https://superuser.com/questions/946612/what-languages-does-the-character-encoding-utf-8-support)

1. What is the difference between input() and raw\_input() functions?

[Stackoverflow: input() vs raw\_input()](https://stackoverflow.com/questions/4915361/whats-the-difference-between-raw-input-and-input-in-python3-x)

1. What is the difference between range and xrange?

[PyNative: range vs xrange](https://pynative.com/python-xrange-vs-range/)

1. What is descriptors?

[Dev: Descriptors](https://dev.to/dawranliou/writing-descriptors-in-python-36) , [docs.python](https://docs.python.org/3/howto/descriptor.html) , [\_\_dict\_\_](https://stackoverflow.com/questions/19907442/python-explain-dict-attribute)

1. What is context manager? What is the purpose of context manager in python? Explain with example.

[Pythontips: Context Managers(with)](http://book.pythontips.com/en/latest/context_managers.html) , [Dbadar: Context Manager(with)](https://dbader.org/blog/python-context-managers-and-with-statement) , [jeff: Ref](https://jeffknupp.com/blog/2016/03/07/python-with-context-managers/)

1. How can we import a python module from any path in a our a module?

[Stackoverflow: Ref](https://stackoverflow.com/questions/10161568/import-python-module-not-on-path) , [RealPython: Ref](https://realpython.com/absolute-vs-relative-python-imports/)

1. What is the difference between deep copy and shallow copy?
2. What #!/bin/python3 does in python module?

→ In computing, a shebang (also called a hashbang, hashpling, pound bang, or crunchbang) refers to the characters "#!" when they are the first two characters in an interpreter directive as the first line of a text file. In a Unix-like operating system, the program loader takes the presence of these two characters as an indication that the file is a script, and tries to execute that script using the interpreter(version of python3 or python2) specified by the rest of the first line in the file. [StackOverFlow](https://stackoverflow.com/questions/2429511/why-do-people-write-the-usr-bin-env-python-shebang-on-the-first-line-of-a-pyt)

DATA TYPES

1. What are the data types in python?
2. What is the difference between TUPLE and LIST?
3. What is the difference between SET and LIST?
4. How list data type is implemented in Python?

→ Python’s list data type is implemented as a dynamic array.

Ref - [Dynamic Array](https://www.geeksforgeeks.org/how-do-dynamic-arrays-work/) [Underlying implementation of list data type](https://stackoverflow.com/questions/914233/what-is-the-underlying-data-structure-for-python-lists)

1. Implement the python list data type?

Or

What happen internally when we add an element to the list?

[Stackoverflow: List implementation](https://stackoverflow.com/questions/3917574/how-is-pythons-list-implemented)

[laurentluce: list implementation](http://www.laurentluce.com/posts/python-list-implementation/)

1. How to find the frequency count of given element of list?
2. What is list, dictionary and set comprehension? Explain with example.
3. How Dict and Set are internally implemented in python?

Stackoverflow: [Diff set vs dict implementation](https://stackoverflow.com/questions/24159713/difference-between-python-set-and-dict-internally) , [set() implementation](https://stackoverflow.com/questions/3949310/how-is-set-implemented)

Geeksforgeeks: [Set internal working](https://www.geeksforgeeks.org/internal-working-of-set-in-python/)

Github: [dictobjects.c](https://github.com/python/cpython/blob/master/Objects/dictobject.c)

Quora: [Why set has O(1) complexity?](https://www.quora.com/Why-do-sets-in-Python-have-an-algorithmic-complexity-of-O-1)

1. How slicing is implemented in python?

Quora: [slicing implementation](https://www.quora.com/How-is-slicing-implemented-in-python)

1. Tell mutable and immutable data types in python?

Geeksforgeeks: [link](https://www.geeksforgeeks.org/mutable-vs-immutable-objects-in-python/)

CLASSES AND OOP

1. What is `self` & \_\_init\_\_ keyword in python?

→ [self & \_\_init\_\_](https://micropyramid.com/blog/understand-self-and-__init__-method-in-python-class/)

1. How \_\_init\_\_ method gets called?
2. Explain class and object?
3. Does python fully supports OOP?

Stackoverflow: [answer](https://stackoverflow.com/questions/3325343/why-is-python-not-fully-object-oriented)

1. What is inheritance? Why use inheritance?

Or

What is multiple, multilevel inheritance?

Or

Does python support multiple inheritance? If yes how it works?

Or

Does python support multilevel inheritance? If yes how it works?

Programiz: [Inheritance](https://www.programiz.com/python-programming/multiple-inheritance)

Python-course: [multiple inheritance](https://www.python-course.eu/python3_multiple_inheritance.php)

1. What is abstraction? Explain with example.
2. What is encapsulation? Where you used encapsulation?
3. What is polymorphism? How it works for python?

Geeksforgeeks: [polymorphism](https://www.geeksforgeeks.org/polymorphism-in-python/)

Digitalocean: [polymorphism](https://www.digitalocean.com/community/tutorials/how-to-apply-polymorphism-to-classes-in-python-3)

1. What is method overloading? How it works in python?
2. What is method overriding? How it works in python?

→ [inheritance, method overriding, super()](http://blog.thedigitalcatonline.com/blog/2014/05/19/method-overriding-in-python/)

1. We have two classes A and B? Explain the execution steps when we print(A(), B()).

FUNCTION | DUNDERS | SPECIAL VARIABLES/METHODS

1. What is default and keyword arguments?

Geeksforgeeks: [default arguments](https://www.geeksforgeeks.org/default-arguments-in-python/)

Programiz: [default, keyword and variable](https://www.programiz.com/python-programming/function-argument)

Or

What does this stuff mean: \*args, \*\*kwargs? And why would we use it?

[CodeMentor: Q8](https://www.codementor.io/sheena/essential-python-interview-questions-du107ozr6)

1. How can we declare a private variable in python? How to access private variable inside a function?

[Private variable](https://stackoverflow.com/questions/34621484/how-to-access-private-variable-of-python-module-from-class)

1. What if \_\_name\_\_ = “\_\_main\_\_” does in python module?

[PSF DOCS](https://docs.python.org/3/library/__main__.html), [GeeksForGeeks](https://www.geeksforgeeks.org/what-does-the-if-__name__-__main__-do/)

1. What are the dunder/magic methods in python? Difference between \_\_repr\_\_ vs \_\_str\_\_ ?

\_\_repr\_\_ is unambiguous and provides more explicit detail of object. Meant for developer. \_\_str\_\_ is easy to read and meant for human consumption. Str internally calls repr.

Dbadar: [\_\_str\_\_ vs \_\_repr\_\_](https://dbader.org/blog/python-repr-vs-str) , [Dunders](https://dbader.org/blog/python-dunder-methods)

Geeksforgeeks: [Dunders](https://www.geeksforgeeks.org/dunder-magic-methods-python/)

ADVANCE CONCEPT

1. Adavanced Python:

→ [Advanced python made easy part 1](https://medium.com/quick-code/advanced-python-made-easy-eece317334fa)

[Advanced python made easy part 2](https://medium.com/quick-code/advanced-python-made-easy-2-d5a7ffb4e658)

1. What is iterator in python? Explain with one real time example?
2. What is generator in python? Explain with one real time example?
3. What is Decorator in python? Explain with one real time example?
4. What kind of argument decorator can except?
5. What is the meaning of callable?

[Collable](https://kb.froglogic.com/pages/viewpage.action?pageId=131158): 1, [Collable](https://en.wikibooks.org/wiki/Python_Programming/Functions):2

1. What is closure in python? Explain with one real time example?
2. What do these mean to you: @classmethod, @staticmethod, @property?

[@staticmethod vs @classmethod](https://stackoverflow.com/questions/136097/what-is-the-difference-between-staticmethod-and-classmethod)

1. What is getter and setter? Why use getter and setter?
2. What is the difference between iterator and generator?
3. Is there relation between generator and decorators?
4. What is the difference between generator `yield` keyword and return keyword?
5. What is lazy evaluation?
6. When generator returns iterator as result what happens next?
7. What is map , filter and reduce in python? What is the difference between them? Are they mutable or immutable?

[Higher Order Function](https://www.python-course.eu/python3_lambda.php)

1. How the map, filter and reduce implemented internally?

Quora: [map implementation](https://www.quora.com/How-is-map-implemented-internally-in-Python)

1. What is pickling and unpickling? What is the purpose of pickling ? Explain with one real time example.

[docs.python: pickle](https://docs.python.org/3.7/library/pickle.html) , [Pythontips: Pickling](https://pythontips.com/2013/08/02/what-is-pickle-in-python/)

1. What is data serialisation and data deserialisation? And What is the purpose of serialisation and deserialisation? Serialisation vs deserialization.

→ **Serialization** is the process of converting an object into a stream of bytes to store the object or transmit it to memory, a database, or a file. Its main purpose is to save the state of an object in order to be able to recreate it when needed. The reverse process is called **deserialization**.

1. What is monkey patching and is it ever a good idea?

[CodeMentor: Q7](https://www.codementor.io/sheena/essential-python-interview-questions-du107ozr6)

1. How do you keep track of different versions of your code?

[CodeMentor: Q5](https://www.codementor.io/sheena/essential-python-interview-questions-du107ozr6)

EXCEPTION | HANDLING HANDLING

1. What is Exception? How to handle it?
2. What is raise? What is the purpose of it?

[raise](https://composingprograms.com/pages/33-exceptions.html)

1. What is assert?

[assert](https://dbader.org/blog/python-assert-tutorial)

1. How can we define custom exception?

MULTIPROCESSING | PARALLELISM

1. What is synchronous execution?
2. What is asynchronous execution?
3. What is parallel programming?
4. What is multiprocessing?
5. Python and multithreading. Is it a good idea? List some ways to get some Python code to run in a parallel way.

[CodeMentor: Q4](https://www.codementor.io/sheena/essential-python-interview-questions-du107ozr6)

1. Does python allow multithreading? If yes how it works?
2. Does python allow multiprocessing? If yes how it works?
3. What is GIL in python?

[GIL](https://softwareengineering.stackexchange.com/questions/186889/why-was-python-written-with-the-gil)

1. What is the difference between multiprocessing and multithreading?
2. What is the difference between synchronous and asynchronous execution?
3. What is the difference between parallel processing and asynchronous processing?
4. What are the libraries available for multiprocessing and asynchronous processing in python?

REGEX - [PSF - re module](https://docs.python.org/3/library/re.html)

1. re.match() vs re.search().

→[PSF](https://docs.python.org/2/library/re.html#search-vs-match)

1. What is the difference between read(), readline(), readlines() and simply reading a line from file object(for line in f:)?

[Ref-1](https://www.sololearn.com/Discuss/116640/difference-between-readline-and-readlines)

[Ref-2](https://stackoverflow.com/questions/38105507/when-should-i-ever-use-file-read-or-file-readlines)

PROBLEM SOLVING

1. -11 % 10 output? #YouPlus
2. -11 // 10 output? #YouPlus
3. Explain the execution steps for expression a\*\*b\*\*c. #YouPlus
4. Convert a number to word smartly i.e 1055 - One thousand and fifty five. #Dell
5. Fibonacci Series #ANZ
6. Find the all the numbers which are multiple of three and not divisible by five.

#ANZ

1. Find the missing number between N ordered numbers. #AvailFianance
2. Open a file which contain 1-N numbers in order. Find the missing numbers efficiently. #Adobe
3. Open a text file. Check the following condition on each word in text file and return match word.

* Word length should be 2 <= word length <= 5
* First char should be vowel (‘a’, ‘e’, ‘i’, ‘o’, ‘u’)
* Last char should not be vowel. #Dell

REFERENCES

# CodeMentor: [15 Essential Python Interview Questions](https://www.codementor.io/sheena/essential-python-interview-questions-du107ozr6)

1. Docs.python(VIMP): [FAQ](https://docs.python.org/3/faq/design.html)
2. Blackecho: [Understanding pythons underline data structures](https://blackecho.github.io/blog/programming/2016/03/23/python-underlying-data-structures.html)
3. Realpython: [OOPS](https://realpython.com/python3-object-oriented-programming/)

Python Libraries References

1. [NumPy](https://www.geeksforgeeks.org/numpy-in-python-set-1-introduction/)
2. [Matplotlib](https://www.geeksforgeeks.org/python-introduction-matplotlib/)
3. [Scikit-image](https://www.geeksforgeeks.org/getting-started-scikit-image-image-processing-python/)
4. [cProfile](https://medium.com/@alaminopu.me/profiling-your-python-3-code-8c3f695e62da)
5. Python 2to3 tool to convert python2 code to python3

<https://docs.python.org/3/library/2to3.html#to3-reference>