PYTHON THEORY QUESTIONS - Ruvimbo Hungwe

1. What is Python and what are its main features?
   Python is a high level interpreted programming language.

2. Discuss the difference between Python 2 and Python 3
   There a a number of differences between Python2 and Python 3. Python 3 is easier to understand and more readable than Python2. Python 3 code is not backwards compatible to Python2 however Python 2 code can be imported to python 3.

3. What is PEP 8?
   PEP 8 is the style guide for Python code.

4. In computing/computer science what is a program?
   A detailed plan or procedure for solving a problem with a computer

5. In computing / computer science what is a process?
   The execution of a computer program

6. In computing / computer science what is cache?
   Temporary memory in a computer

7. In computing / computer science what is a thread and what do we mean by multithreading?
   A thread is an instruction stream. Multithreading is a CPU feature that allows two or more instruction threads to execute independently while sharing the same process resources.

8. In computing / computer science what is concurrency and parallelism and what are the differences?

9. What is GIL in Python and how does it work?
   Global Interpreter Lock.

10. What do these software development principles mean:

    1. DRY - Don’t repeat yourself

    2. KISS - Keep it simple stupid

    3. BDUF - Big design up front

11. What is a Garbage Collector in Python and how does it work?

    It is the process by which Python periodically frees and reclaims blocks of memory that no longer are in use

12. How is memory managed in Python?
    By a memory manager which manages chunks of memory called blocks

13. What is a Python module?
    It is a file containing Python statements and definitions

14. What is docstring in Python?
    They are string literals that appear after the definition of a function

15. What is pickling and unpickling in Python? Example usage.
    Pickling is the process where a Python object hierarchy is converted into a byte stream whereas unpickling is a process where a byte stream is converted back into an object hierarchy.

16. What are the tools that help to find bugs or perform static analysis?
    PyChecker, Pylint and PyFlakes

17. How are arguments passed in Python by value or by reference? Give an example.
    By reference

18. What are Dictionary and List comprehensions in Python? Provide examples.

They are a way of storing elements

19. What is namespace in Python?

Is a collection of names for each object in Python

20. What is pass in Python?

A pass in python is a null statement

21. What is unit test in Python?

Small tests to python code

22. In Python what is slicing?

Slicing is a feature that allows the user to access parts of sequences such as strings, tuples and lists

23. What is a negative index in Python?

Negative indexes are used to access elements of an array from the last element

24. How can the ternary operators be used in python? Give an example.

It can provide a way to shorten an if else block

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

They allow the user to pass multiple arguments or keyword arguments to a function

26. How are range and xrange different from one another?

Range returns a Python list object whereas orange returns an orange object. They both provide a way to generate a list of integers.

27. What is Flask and what can we use it for?

Flask is a python web framework which can be used to create web applications in python

28. What are clustered and non-clustered index in a relational database?

A clustered index are indexes that store and sorts rows of data in the table based on their key values. Whereas in a non-clustered index the order of the index doesn't match the physical stored order of the rows.

29. What is a 'deadlock' a relational database?

An instance in which two or more transactions are waiting for one another to give up locks

30. What is a 'livelock' a relational database?

An instance in where a request for an exclusive lock is repeatedly denied as a result of many overlapping shared locks interrupting each other