1. Python theory questions

1. What is the program?

A Programm is a set of instructions that is given to a computer to follow. Software is made up of multiple programs that all work together

2. What is the process?
   A process is a set of instructions a computer is dealing with. An example of this is running a set of code, a computer will be 'processing' this set of code

3. What is Cache?
   Cache is a hard/software object that stores data to support the functionality of a computer/ device. Having a cache helps programs run faster or more efficient, and clearing 'cache' will eliminate any problems with performance

4. What is Thread and Multithreading?
   Threading is when a computer is able to split itself so it is able to process tasks and code simultaneously. Multi threading is when a thread of code is being used by multiple processors.

5. What is GIL in Python and how does it work?
   GIL is Global interpreter lock and this is a way for Python to be used safely with C libraries. GIL allows multithreading

6. What is Concurrency and Parallelism and what are the differences?

7. What do these stand for in programming: DRY, KISS, BDUF
   DRY: don't repeat yourself KISS: Keep it simple stupid!!!
   BDUF:big design up front

8. What is Garbage collector? How does it work?
   garbage collector is a way for python to monitor all of its objects that it has stored. Garbage collector is like a memory manager that will get rid of un-needed objects and is responsible for memory management within python.

9. What are ‘deadlock’ and ‘livelock’ in a relational database?
   dead lock is what happens when there is a conflict within processes that are attempting to access the same resource. This happens when two processes are trying to get to the resource at the same time. One process will win and the other will loose, the loosing process will have to wait until the winning process has finished using this resource.

Livelock is similar to deadlock in that two processes are aiming to get to the same resource, however in lovelock both processes are not able to access it at all as they are waiting for the other to go first. Livelock processes will change in condition in aim to get to their destination, it is because of this that both processes struggle to reach the destination.

10. What is Flask and what can we use it for?
    flask is an integrative framework used in python, it is used to easily write web based applications.

2. Discuss the difference between Python 2 and Python 3

Python 3 is the updated version of Python 2, although similar Python has many updated features. This includes the use of importable modules which are helpful when processing particular types of software eg maths. Python 3 was developed to be more effective, this means you will have to repeat yourself less when writing programs which makes for much easier to understand code. Python 3 is known for its readability for this reason. Python 2 can only be written with English characters- this is different to updated python 3 which is able to use special characters such as @ and \ . This has mean that you are able to do more things within your code as there are more functions that are readily available to use.

The syntax used in python 2 is different to python 3, python 3 is known to be more clearer and easy to read.

```
3. def word (inputstring):
    return inputstring [::1]
def Palindrone (inputstring):
    reverseString= word(inputstring)
    if (inputstring == reverseString):
        return True
    return False
s= input("Enter a string")
result = Palindrone(s)
if result ==1:
    print ("the string is a Palindrone")
else: print ("the string is not a palindrome”)
```

```
4. #This is my tes, here we are checking to see if it works.
we are asserting the palidrome program with a word and
assessing whethere it is true or not.

import unittest
import word

class TestWord(unittest.TestCase):

  def test_word(self):
    assert word('mum') == True
```

```
    assert word ('LOL') == True
    assert word ('pizza') == False
```

```
if __name__== 'main':
  unittest.main()
```

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5. Agile methodology, Scrum:name at least 3 types of meetings that are exercised by Agile teams and describe the objective of each meeting.

1- Daily Scrum, meeting held every day for about 15 minutes set boundaries and tone for the day. This can be lead by scrum master. They will address what has been completed and what priorities there are for the day and also any extra tasks that need to be addressed.
2- Backlog refinement, this meeting is done to address backlog items and delegate them to members within the team. This is time to reflect on where the teams strengths lie and who may wish to take on those back log items
3- Sprint Planning meeting, this is a meeting initiated by the product owner/ manager. They are responsible for who will be in charge of the sprint. The PO will delegate the tasks to the rest of the team and will highlight where they want more attention to detail or effort. The person who is in charge of this sprint may be dependent on what part of software development this item is at.

6. Exception handling in Python, explain what each of the following blocks means in the program flow:

Try - run this code first

Except- an exception, run this exception if there is an unanticipated response

Else- the third thing to run if there are no exceptions as above

Finally- this code will always run, despite any exceptions or ‘else’s.

7. **How can we connect a Python program (process) with a database? Explain how it works and how do we fetch / insert data into DB tables from a python program.**

We are able to connect through a database through importing modules on Python. My SQL connector is an add on that allows python to look into databases of the local user. After this the user must use a connect () method to pair up their python IDE and their local database, here a user must input their details of the SQL workbench to gain access to the databases they wish to pair with python.

Once access is gained into my SQL workbench through python, the use must use the cursor () method to navigate through the program and select the correct data base they with to use.

8. SQL Question

SELECT DISTINCT authors.author_name, books.book_name, books.sold_copies

FROM authors

LEFT JOIN books

on authors.book_name = books.book_name

GROUP BY author_name

order by sold_copies desc

;

8. my_numbers = [3, 5, -4, 8, 11, 1, -1, 6]

```
target = 10
sum_to_target = []
```

```
def two_number_sum(my_numbers, target):
    for number in my_numbers:
        num_to_target = target - number
        if num_to_target in my_numbers and num_to_target != number:
            return [number, num_to_target]
        sum_to_target.append(number)
    return[]
```

```
print(two_number_sum(my_numbers, target))
```