

ASSESSMENT

Python and MySQL
assessment test 2 hours

NO	TASK	POINTS
1	Theory questions	20
2	Concept question	8
3	Coding question	8
4	Coding question	8
5	Concept question	8
6	Concept with practical example	8
7	Concept question	8
8	SQL practical question	10
9	Coding question	22
TOTAL		100

1. Python theory questions	10 points
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1. What is the program?
2. What is the process?
3. What is Cache?
4. What is Thread and Multithreading?
5. What is GIL in Python and how does it work?
6. What is Concurrency and Parallelism and what are the differences?
7. What do these stand for in programming: DRY, KISS, BDF
8. What is Garbage collector? How does it work?
9. What are 'deadlock' and 'livelock' in a relational database?
10. What is Flask and what can we use it for?

2. Discuss the difference between Python 2 and Python 3	8 points
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3. Write a function that can define whether a word is a Palindrome or not (a word, phrase, or sequence that reads the same backwards as forwards, e.g. <i>madam</i>)	8 points
4. Write tests for the newly created Palindrome function. Provide a brief explanation for your test case options.	8 points
5. Agile methodology, Scrum: name at least 3 types of meetings that are exercised by Agile teams and describe the objective of each meeting.	8 points
6. Exception handling in Python, explain what each of the following blocks means in the program flow: Try, except, else, finally	8 points
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.	8 points
8. Given two SQL tables below: authors and books. <ul style="list-style-type: none"> • The authors dataset has 1M+ rows • The books dataset also has 1M+ rows Create an SQL query that shows the TOP 3 authors who sold the <u>most books in total</u> !	10 points

AUTHORS

author_name	book_name
author_1	book_1
author_1	book_2
author_2	book_3
author_2	book_4
author_2	book_5
author_3	book_6

BOOKS

book_name	sold_copies
book_1	1000
book_2	1500
book_3	34000
book_4	29000
book_5	40000
book_6	4400

9. TWO NUMBER SUM:

22 points

- Write a function that takes in a non-empty array of distinct integers and an integer representing a target sum. If any two numbers in the input array sum up to the target sum, the function should return them in an array, in any order. If no two numbers sum up to the target sum, the function should return an empty array.
- Note that the target sum has to be obtained by summing two different integers in the array. You cannot add a single integer to itself in order to obtain the target sum.
- You can assume that there will be at most one pair of numbers summing up to the target sum.

Sample Input: numbers = [3, 5, -4, 8, 11, 1, -1, 6] target_sum = 10

Sample Output: [-1, 11] the numbers can be in any order, it does not matter.

