**POSTSESSION TASK QUESTIONS**

Date : 27-02-2024

**Python Questions:**

1. Write a Python function that takes a list of integers as input and returns the second smallest element in the list.

def second\_smallest(nums):

if len(nums) < 2:

return "List must have at least two elements"

sorted\_nums = sorted(nums)

return sorted\_nums[1]

numbers = [5, 2, 8, 1, 9, 3]

print("Second smallest element:", second\_smallest(numbers))

**Output:**

Second smallest element: 2

2. Create a Python class named `Employee` with attributes `name` and `salary`. Write a method `get\_tax\_rate()` that returns the tax rate based on the salary, where tax rates are categorized as follows: 0% for salary less than 50000, 10% for salary between 50000 and 100000, and 20% for salary greater than 100000.

class Employee:

def \_\_init\_\_(self, name, salary):

self.name = name

self.salary = salary

def get\_tax\_rate(self):

if self.salary < 50000:

return 0

elif 50000 <= self.salary < 100000:

return 0.10

else:

return 0.20

# Example usage:

employee1 = Employee("John", 45000)

employee2 = Employee("Alice", 75000)

employee3 = Employee("Bob", 120000)

print(employee1.name, "Tax Rate:", employee1.get\_tax\_rate())

print(employee2.name, "Tax Rate:", employee2.get\_tax\_rate())

print(employee3.name, "Tax Rate:", employee3.get\_tax\_rate())

**Output:**

John Tax Rate: 0

Alice Tax Rate: 0.1

Bob Tax Rate: 0.2

3. Write a Python function to check if a given string is a palindrome or not (considering only alphanumeric characters and ignoring cases).

def is\_palindrome(s):

# Remove non-alphanumeric characters and convert to lowercase

cleaned\_str = ''.join(char.lower() for char in s if char.isalnum())

# Check if the cleaned string is equal to its reverse

return cleaned\_str == cleaned\_str[::-1]

# Example usage:

string1 = "A man, a plan, a canal, Panama!"

string2 = "race a car"

print(f'"{string1}" is a palindrome:', is\_palindrome(string1))

print(f'"{string2}" is a palindrome:', is\_palindrome(string2))

**Output:**

"A man, a plan, a canal, Panama!" is a palindrome: True

"race a car" is a palindrome: False

4. Implement a Python generator function called `fibonacci\_generator` that yields the Fibonacci sequence indefinitely.

def fibonacci\_gen():

a = 0

print(a)

b = 1

print(b)

# for i in range(100):

while True:

c = a + b

print(c)

a = b

b = c

fibonacci\_gen()

**SQL Questions:**

1. Write an SQL query to find the second highest salary from an Employee table.

SELECT DISTINCT Salary

FROM Employee

ORDER BY Salary DESC

OFFSET 1 ROW

FETCH NEXT 1 ROW ONLY;

2. Consider a table named `Orders` with columns `order\_id`, `customer\_id`, and `order\_date`. Write an SQL query to find the customer\_id(s) who placed the most orders in a given month.

SELECT customer\_id

FROM (

SELECT customer\_id, COUNT(\*) AS order\_count

FROM Orders

WHERE EXTRACT(MONTH FROM order\_date) = month -- Replace month with the desired month (e.g., 1 for January)

GROUP BY customer\_id

ORDER BY order\_count DESC

LIMIT 1

) AS max\_orders;

3. Given a table named `Products` with columns `product\_id`, `product\_name`, and `unit\_price`, write an SQL query to find the top 5 most expensive products.

SELECT product\_id, product\_name, unit\_price

FROM Products

ORDER BY unit\_price DESC

LIMIT 5;