[redacted]

Question 1:

Write a Python function called def_word_cnt that takes in a string and returns a dictionary where the keys are the unique words in the string and the values are the counts of each word, and then write the result into XML file name "result.xml"?

1. Send the result.xml in email for this input string *"Bạn là thí sinh tuyệt vời nhất mà tôi từng gặp. Bạn quá xuất sắc, quá tuyệt vời!"*
2. Do not use looping in Python, generate 100 files result.xml with name from result_1.xml, result_2.xml, … result_100.xml

Example:
Input: "hello world hello"
Output: {'hello': 2, 'world': 1}

Input: "data engineering is awesome"
Output: {'data': 1, 'engineering': 1, 'is': 1, 'awesome': 1}

Question 2:

How would you structure a database schema to store address information for customers, considering that the addresses of some customers may change over time? Give pros and cons for each option?

Question 3:

You are given a JSON file named "employees.json" that contains employee data in the following format:

```
[
  {
    "id": 1,
    "name": "John Doe",
    "department": "Marketing",
    "salary": 50000,
    "join_date": "2022-01-01"
  },
  {
    "id": 2,
    "name": "Jane Smith",
    "department": "Sales",
    "salary": 60000,
    "join_date": "2021-05-15"
  },
  {
    "id": 3,
    "name": "Mark Johnson",
    "department": "Finance",
    "salary": 75000,
    "join_date": "2023-02-28"
  },
  ...
]
```

Your task is to write a Python script that performs an ETL process on the given JSON file to transform and load the data into a Microsoft SQL (or any SQL) database. Here are the details:

1. Create a table named "employees" in the Microsoft SQL (or any SQL) database with the following columns: id (integer), name (text), department (text), salary (integer), and join_date (date).

2. Extract the data from the JSON file.

3. Transform the data by converting the "join_date" string to a date format and removing any unnecessary fields.

4. Load the transformed data into the "employees" table in the Microsoft SQL (or any SQL) database.

5. Handle any necessary error handling and data validation during the ETL process.

Question 4:

Given:

ORDER table containing client order information as below (one client can have any number of order):

Order_ID	Date_Order	Good_Type	Good_Amount	Client_ID
10	01.May.2019	Computer	10.000.000	88
24	06.Jun.2020	Laptop	8.000.000	123
35	07.Oct.2020	Monitor	3.000.000	10

ORDER_DELIVERY table containing order delivery information:

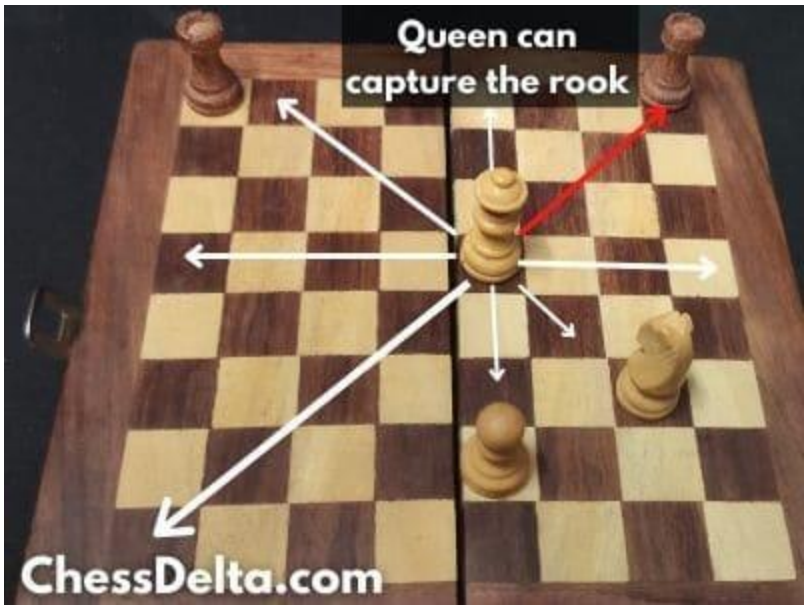
Order_ID	Date_Delivery	Delivery_Employee_Code
15	06.Jul.2020	1a
2	22.Apr.2017	5c
3	09.Nov.2018	6e

Create SQL queries which return data according to listed request:

1. Count number of unique client order and number of orders by order month.
2. Get list of client who have more than 10 orders in this year.
3. From the above list of client: get information of first and second last order of client (Order date, good type, and amount)
4. Calculate total good amount and Count number of Order which were delivered in Sep.2019
5. Assuming your 2 tables contain a huge amount of data and each join will take about 30 hours, while you need to do daily report, what is your solution?

QUESTION 5:

The eight queens puzzle is how to find an arrangement of eight chess queens on a board such that they cannot attack each other. This recursive program finds every possible solution on an 8 x 8 chess board.
Rule: Queens Puzzle Moving Rule



---------- END ----------