1. What is a regex (regular expression), and why is it useful in data science?
   - It's a sequence of characters that defines a pattern used to match and compare to a specific text.
   - It is useful for data cleaning , text manipulation , pattern matching and data validation.

2. Create a regex to validate email addresses.
   - ^[a-zA-Z0-9._+-]+@[a-zA-Z0-9]+\.[a-zA-Z]{2,}

3. What do you know about databases (Definition and types)?
   -A database is an organized collection of data that can be accessed, managed, and updated efficiently. it stores information in a structured format to enable easy retrieval, manipulation, and querying.
   a. A relational database : organize data into one or more table , each table has a unique key identifies each row.
   b. Non-relational database : do not use a fixed schema , designed for unstructured data.
4. What is the difference between foreign key and primary key?
   -primary key : is a unique key that identifies each record in a table
   - foreign key : A column that establishes a relationship between two tables by referencing the primary key in another table.

5. Difference between RANK and DENSE_RANK ?
   - RANK : assigns the same rank to tied rows, but skips the next rank(s). Used when gaps in ranking are acceptable
   - DENSE RANK : Assigns the same rank to tied rows but does not skip ranks. Used when continuous ranking is needed without gaps.
6. What is the difference between WHERE and HAVING clauses?
   - WHRER : is a clause that indicates you want to filter the result set to include only rows where the following condition is true.
   - HAVING : was added to sql because the where keyword could not be used with aggregate functions.
7. What is the difference between DELETE and TRUNCATE clauses?
   - DELETE : Removes specific rows from a table based on a condition, Can include a WHERE clause to filter rows for deletion and Slower for large datasets.
   - TRUNCATE : Removes all rows from a table, Does not support a WHERE clause. Faster because it deallocates entire data pages without logging individual rows.

8. What are the differences between INNER JOIN, LEFT JOIN, RIGHT JOIN, and FULL JOIN?
   - INNER JOIN : It is used to return all the rows from multiple tables where the join condition is satisfied.
   - LEFT JOIN : used to return all the rows from the left table but only the matching rows from the right table where the join condition is fulfilled.
   - RIGHT JOIN : used to return all the rows from the right table but only the matching rows from the left table where the join condition is fulfilled.
   - FULL JOIN : returns all the records when there is a match in any of the tables. Therefore, it returns all the rows from the left-hand side table and all the rows from the right-hand side table.

9. SQL PROBLEM 1 :
   - SELECT TWEET_ID

     FROM TWEETS

     WHERE LENGTH(CONTENT) > 15

10. SQL PROBLEM 2 :
    - SELECT teacher_id ,

      COUNT(DISTINCT subject_id) AS cnt

      FROM teacher table
      GROUB BY teacher_id

11. SQL PROBLEM 3:
    - SELECT name FROM Embloyee table
      WHERE(
      SELECT managerId
      FROM Embloyee table
      WHERE managerId is NOT NULL
      GROUP BY managerId
      HAVING COUNT(id) >= 5)