1. **What is the role of the "CAST" function in SQL and how does it help with formatting and conversion of data? (not applicable using code eval)**

   It is used to convert an expression of one data type into another

   Syntax:

   CAST (expression AS data_type)

   Example:

   SELECT CAST('2022-01-01' AS date) AS converted_date; # 2022-01-01

   SELECT CAST(3.14159 AS decimal(5,2)) AS formatted_number; # 3.14

2. **How many formatting and conversion functions are available in SQL, and what are they used for? (not applicable using code eval)**

   Cast:

   Convert data into different data types such as char, time, date, datetime

   SELECT CAST("ABC" as CHAR) as converted_data FROM dual;

   Convert_TZ:

   Convert a date and time value from one time zone to another.

   For example, to convert a datetime value from UTC to Pacific Standard Time

   SELECT CONVERT_TZ(column_name, 'UTC', 'PST') as converted_data FROM table_name;

   UTC_Timestamp:

   Returns the current UTC date and time

   SELECT UTC_TIMESTAMP as current_utc_time;

   Str_To_Date:

   Convert a string expression into a date or datetime value.

   For example, to convert a string into a date value

   SELECT STR_TO_DATE("2021-01-12", '%Y-%m-%d') as converted_data FROM table_name;

   Time_Format:

   Format a time value. For example, to format a time value into a 12-hour clock format

   SELECT TIME_FORMAT("12:15 55", '%h:%i %p') as formatted_time FROM dual;

3. **What are the differences between the mathematical functions "ln," "log10," "log2," and "exp"?**

   ln (natural logarithm) : returns the logarithm of a value to the base e (approximately 2.718).

   log10 : returns the logarithm of a value to the base 10.

   log2 : returns the logarithm of a value to the base 2.

   exp : returns the value of e raised to the power of the input value.

4. **What is the difference between the functions "round," "ceil," "floor," and "truncate" in SQL?**

   round : rounds a decimal value to the specified number of decimal places.
   ceil : rounds a decimal value up to the nearest integer.
   floor : rounds a decimal value down to the nearest integer.
   truncate: truncates a decimal value to the specified number of decimal places, discarding the fractional part.

5. **What is the difference between sqrt, mod, div, and power functions in SQL**

   SQRT
   - select sqrt(4) from dual;
   - select power(4,(1/2)) from dual;

   MOD
   - select mod(5,2) from dual;
   - select 5 % 2 from dual;

   DIV
   - select 5 / 2 from dual;
   - select 5 div 2 from dual;

   POWER
   - select 4 * 4 from dual;
   - select power(4,2) from dual;

6. **How can you determine the sign of a value in SQL, and what is the "abs" function used for?**

   Sign:

```
SELECT
CASE
        WHEN value < 0 THEN 'Negative'
        WHEN value = 0 THEN 'Zero'
        ELSE 'Positive'
END AS sign
FROM mytable;
```

   Abs:

```
SELECT abs(-123) AS absolute_value;
```

7. **How to check the minimum value for row-wise and column-wise data in sql?**
[Hint: lowest, min] **(not applicable using code eval)**
Row-wise
- select lowest(2, 5, 1, 2, 5, 4) from dual;
- select lowest(table1.column1, table2.column1, table3.column1) from table1, table2, table3;

Column-wise
- select min(column) from table_name;

8. **How to check the maximum value for row-wise and column-wise data in sql?**
[Hint: greatest, max] **(not applicable using code eval)**
Row-wise
- select greatest(2, 5, 1, 2, 5, 4) from dual;
- select greatest(table1.column1, table2.column1, table3.column1) from table1, table2, table3;

Column-wise
- select max(column) from table_name;

9. **What is the difference between coalesce and ifnull functions in sql?**
They both serve the same purpose of returning the first non-NULL value in a list of arguments.
The main difference between COALESCE and IFNULL is the number of arguments that each function takes. COALESCE can take multiple arguments, whereas IFNULL only takes two arguments.
Example:
select coalesce(1, Null, 2, 3, Null) from dual;
select ifnull(column, 0) from table_name; # replace null values by 0

10. **What is the flow of the execution for sorting columns in sql?**
From → where → select → order by → limit → offset
Tables → filtering columns → restricting only columns → sorting columns → restricting only rows → starting index of the selected row

11. **How to sort data based on individual columns, including the default sorting method and custom sorting options in SQL?**
Sorting with Ascending or Descending order
select * from table_name order by column1 asc, column2 desc, column asc;

Custom Sorting
select * from table_name order by (case when column2 = 'condition' then 1 when column2 = 'condition' then 2 else 3 end), column1;

select * from table_name order by field(column, value1, value2, value3); # values should be present in the column if omitted it is sorted last

12. What is the field function in SQL and how is it used in the ORDER BY clause to sort data based on custom sorting options? (not applicable using code eval)

It returns the position of a value within a set of values, which can then be used in the ORDER BY clause to sort the data.

For example, if you have a table named "employees" with columns "last_name" and "first_name", you can sort the data by the last name in ascending order, and then by the first name in descending order

SELECT * FROM employees ORDER BY field(last_name, first_name) DESC;