

MySQL Q&A

Baboo J. Cui, Yangang Cao

June 21, 2019

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1 MySQL Basic Concept

1. What is database?
A container for data
2. What is SQL?
Short for structured query language, not a patented language
3. Is SQL case sensitive?
No!
4. How to end a SQL statement?
Must be ended with ';', otherwise wont be finished
5. What is DBMS?
Database manage system
6. What is table?
List of specific data type
7. What is schema?
Layout info of tables and databases
8. What is column?
A field in a table, all tables are composed by one or many columns
9. What is row?
A row essentially is a record
10. What is data type?
The type of data(straight forward)
11. What is primary key?
A column that can uniquely determine a row(record)
12. Properties of primary key?
Must be unique for each row, cannot be NULL

2 MySQL Software

1. What 2 parts does MySQL contain?
Server part and client part
2. How to install MySQL?
Use command `$ apt install mysql-server`, note, the program by default should be server!
3. How to connect to MySQL in console?
Use command `$ mysql -u UNAME [-h HOST_IP] [-P PORT_NUM] -p` to login into database
4. How to connect to MySQL by workbench?
GUI, easy

5. How to exit MySQL?
Use command > quit or > exit
6. What is default port of MySQL?
Port 3306
7. How to rename connection name in workbench?
Topbar Database -> Manage Connections -> Connection Name

3 Show Top-Level Info

1. How to show all databases?
Use command > SHOW DATABASES;
2. How to choose a database to use?
Use command > USE database_name; Data can be used only after the database is opened!
3. How to show all tables info in a database?
Use command > SHOW TABLES; Tip: a schema usually has more than 1 table
4. How to show column info of a table?
Two ways: use command > SHOW COLUMNS FROM table_name; or > DESCRIBE table_name;
5. What will be show in column info?
Field(name of col), Type(int, char), NULL(control if could be empty), Key(primary key?), Default, Extra(auto_incre?)
6. How to see current accessibility?
Use command > SHOW GRANTS;
7. Use command > SHOW GRANTS;
Use command > SHOW STATUS;

4 Retrieving Data

1. How to show a table?
Use command > SELECT * FROM table_name; Tip: * is wildcard, it is not efficient, result orders may vary
2. How to show a column?
Use command > SELECT col_name FROM table_name;
3. How to show several columns?
Use command > SELECT col_1, col_2 FROM table_name; Tip: add “,” between several columns
4. Show distinct values in certain column?
Use command > SELECT DISTINCT col_name FROM table_name; Tip: add “,” between several columns

5. Show limited num of output?
Use command `> SELECT col_name FROM table_name LIMIT num;` This will only output num rows, e.g. num=10
6. Show limited num of output with offset?
Use command `> SELECT col_name FROM table_name LIMIT num1 OFFSET num2;` start from num2 with limit=num1
7. What is about fully qualified table name?
Use “.” operator to specify column or table, e.g. `> SELECT table_name.col_name FROM table_name;`

5 Sorting Retrieving Data

1. How to order the output?
Use keyword ORDER BY, e.g. `> SELECT col_1, col_2, col_3 FROM table ORDER BY col_1, col_2;` Tip: first go through col_1 and then col_2
2. How to specifying order direction?
By default, ASC(ascending) is used, we can set it to DESC: `> SELECT col FROM table ORDER BY col DESC;`
3. What is the range of DESC?
DESC only works on its following column, apply to more columns if DESC is needed
4. Relationship between ORDER BY and LIMIT?
LIMIT must follow ORDER BY, namely, ORDER BY cannot be used before LIMIT

6 Data Filtering

1. How to add search criteria?
Use keyword WHERE, add a where clause
2. Relationship between ORDER BY and WHERE?
ORDER BY should follow WHERE, ORDER BY deals with output generated by WHERE
3. How to search with equality constraint?
Add equality condition after WHERE: `> SELECT col FROM table WHERE col=num`(like column condition)
4. WHERE clause operators?
=, !=, <, <=, >, >=, BETWEEN, all of them are quite straightforward
5. How to use keyword BETWEEN?
Use clause BETWEEN a AND b, `> SELECT col FROM table WHERE col BETWEEN a AND b;`
6. How to check NULL value?
Use clause WHERE col IS NULL, Note that NULL is a special value, must deal with it specifically

7. Logical operators for WHERE clause?
Basically 3 operators: AND, OR and NOT
8. Priority of logical operator?
NOT>AND>OR. Dont have to remember these, use “()” to make everything clear
9. What is IN operator for?
To specify a certain value in a set, > SELECT col FROM table WHERE col IN (a, b, c);

7 Wildcard Filtering

1. What is wildcard?
Special chars that is used to match certain pattern
2. What is the keyword for using wildcard?
Keyword LIKE, > SELECT col FROM table WHERE col LIKE ‘1f%’;
3. What does “%” match?
“%” matches any char by anytime, sounds like whatever. “%” doesnt match NULL, matching may be case sensitive base on settings
4. What does “_” match?
“_” matches any char by one time
5. Techniques of using wildcard?
Don’t use too much, resource consuming; Any matching start with wildcard is very slow

8 Searching with Regular Expression

1. What is regular expression for?
For matching special string in context, regular expression is a special language
2. Which keyword is related to regular expression?
Use keyword REGEXP
3. Similarity between wildcard and regexp?
They both are used for matching a string(though in different way)
4. Difference between wildcard and regexp?
Wildcard is offered in system level and regexp is a language. LIKE is for whole string, REGEXP is for substring
5. What is the format for using regular expression?
By clause REGEXP ‘regexp_statement’ > SELECT col FROM table WHERE col REGEXP ‘regexp’;
6. How to make REGEXP case-sensitive?
By adding a keyword BINARY after REGEXP

7. What does “.” do in regexp?
For matching any one char
8. How to match more than one case?
Connect more than one case by “|”, e.g REGEXP ‘1000|2000’, like OR in SELECT, or use “[]”, e.g REGEXP ‘[123] ton’
9. How to match a number?
By REGEXP ‘[0-9]’
10. How to match a letter?
By REGEXP ‘[a-z]’
11. How to match special content like “.”
Add ‘\’ before it, e.g REGEXP ‘\.’ Usually regexp requires one ‘\’, but regexp in MySQL requires two
12. What is character class?
Just remember some: [:alnum:]=letter+num, [:alpha:]=letter, [:digit:]=num
13. What is “*” for?
Match any times, include zero time
14. What is “+” for?
Match one or many times
15. What is “?” for?
Match zero time or one time
16. What is “{n}” for?
For matching n times
17. What is “{n,}” for?
For matching at least n times
18. What is “{n, m}” for?
For matching n to m times
19. What is “^” for?
Indicate the beginning of the text
20. What is “\$” for?
Indicate the ending of text
21. What is “[[:<:]]”?
Indicate the beginning of a word
22. What is “[[:>:]]”?
Indicate the ending of a word

9 Create Calculated Field

1. What is field?
Field == column (almost)
2. What is calculated field?
Do something to field(s), it is not in database, it is generated during the run time
3. Concatenate field?
Use keyword CONCAT(), e.g. > SELECT CONCAT(col_1, +, col_2) FROM table;
4. What does Trim(), LTrim() and RTrim() do?
They all act on column(field) for deleting extra white-space
5. How to use alias?
Use keyword AS. e.g > SELECT whatever AS alias__name FROM table; note that alias is also called derived column
6. What is the range of AS?
AS only works on its previous column, namely give an alias name right before it
7. Arithmetic operation in MySQL?
Easy: +, -, *, /
8. Example of arithmetic operation?
> SELECT price, quantity, price*quantity AS total FROM table;
9. How to get current time?
> SELECT Now();

10 Using Data Manipulation Function

1. How to convert text to upper case?
Use function UPPER(str), Tip on LOWER(str)
2. How to get length of string?
Use function LENGTH(str)
3. How to trim a string?
Use function TRIM(str), Tip on LTRIM(str) and RTRIM(str)
4. How to get current time info?
SELECT NOW();
5. How to get current date?
SELECT CURDATE();
6. How to get current time?
SELECT CURTIME();

7. How to get part of date?
DAY(date), MONTH(date), YEAR(date), Tip: HOUR(time), MINUTE(time), SECOND(time)
8. What is date format in SQL?
yyyy-mm-dd, Use =, BETWEEN in WHERE to make time control powerful
9. How to avoid data format error in SQL?
Always use DATE() to do type coercion to avoid that
10. Any common numerical function?
ABS(), EXP(), MOD(), PI(), RAND(), SQRT(), TAN(), SIN()

11 Summarizing Data(Aggregate Function)

1. What is aggregate function?
A function that works on a column and return a scalar value
2. What are all aggregate function offered in SQL?
AVG() for average, COUNT(), MAX(), MIN(), SUM(), all 5 functions
3. How AVG() acts on NULL value?
Just ignore the value, Tip: AVG() only works on one column
4. Default of aggregate function?
By default, ALL condition is used, if distinct values are required, use DISTINCT keyword, > SELECT AVG (DISTINCT col)

12 Grouping Data

1. How to create group?
Use keyword GROUP BY, usually is used with aggregate function
2. What keyword is used for setting condition?
Use keyword HAVING, e.g > SELECT COUNT(*), price FROM juno.app_order GROUP BY price HAVING price>10000 ORDER BY price;
3. Keywords order with HAVING?
SELECT, FROM, WHERE, GROUP BY, HAVING, ORDER BY, LIMIT,
Tip: LIMIT is almost always in the end
4. Difference between WHERE and HAVING?
WHERE is used before grouping and HAVING is for grouped result

13 Subquery

1. What is subquery?
Nest one SQL statement into another
2. Scope of variable?
Usually, use table.var to specify the variable

3. When will subquery be used?
Usually in IN statement, other statements also use this
4. Comment on subquery?
For convenience, subquery can be decomposed into several statements, also it can be used with calculated fields

14 Joining Tables(inner join)

1. What is primary key?
A unique value that can determine a record(row)
2. What is foreign key?
A column(field) that contains the primary key of another table
3. What is called scale well?
System works well when magnitude of database increases significantly
4. How to join table?
Just write more than 2 tables after select, this will create a Cartesian product, Usually WHERE statement is required to make it work
5. What is inner join?(Most common one)
It is equal-join, based on value equality
6. Syntax of inner join?
> SELECT a_c1, a_c2, b_c1, b_c2 FROM a INNER JOIN b ON a.a_c1=b.b_c;
note ON is used, not WHERE
7. Disadvantage of join?
Dont join too much if unnecessary, performance will be very poor

15 Advanced Join(self join and outer join)

1. How many joins are there?
Inner join(equal-join), self join, natural join(trivial), outer join.
2. What is self join?
Select part of table based on feature of itself. E.g > SELECT t1.c1, t1.c2
FROM tab AS t1, tab AS t2 WHERE t1.c=t2.c AND t2.c1=val;
3. Could self join be achieved by other methods?
Yes, subquery can achieve the same result
4. What is outer join?
Join that contains irrelevant rows in table(will show everything of one table).
Use key word LEFT OUTER JOIN or RIGHT OUTER JOIN, left and right must be specific
5. Key words of outer join with aggregation?
SELECT, COUNT, AS, ON, GROUP BY

16 Combining Queries

1. What is combining queries?
Execute more than one `SELECT` and return result as one
2. How to combine queries?
Use keyword `UNION`
3. Regulation on `UNION`?
Must be more than 2 `SELECT`, each `SELECT` result must be compatible, repetition is deleted by default
4. How to show all result(repeated included)?
Add keyword `ALL` after `UNION`, namely `UNION ALL`
5. Where `ORDER BY` should be used w.r.t. `UNION`?
In the end, `ORDER BY` works on the total result

17 Extra

1. Cannot install `mysqlclient` in `centOS`
\$ `yum install mysql-community-devel.x86_64`