> 【有道云笔记】https://note.youdao.com/s/T2FZ3b0M

关于《Mysql索引优化实战一》中课上示例是基于Mysql5.7的。mysql8也同样适用，有区别会在本文档中进行记录

示例表

如果示例脚本执行失败，可以使用下面的脚本

```
-- 删除已存在的 insert_emp 存储过程（如果存在的话）
DROP PROCEDURE IF EXISTS insert_emp;

-- 修改语句结束符为 ;;
DELIMITER ;;

-- 创建 insert_emp 存储过程
CREATE PROCEDURE insert_emp()
BEGIN
  DECLARE i INT DEFAULT 1;
  WHILE i <= 100000 DO
    INSERT INTO employees(name, age, position) VALUES(CONCAT('zhuge', i), i, 'dev');
    SET i = i + 1;
  END WHILE;
END;;

-- 恢复语句结束符为 ;
DELIMITER ;

-- 调用 insert_emp 存储过程
CALL insert_emp();
```

举一个大家不容易理解的综合例子：

4、in和or在表数据量比较大的情况会走索引，在表记录不多的情况下会选择全表扫描

- **mysql5.7**

做一个小实验，将employees 表复制一张employees_copy的表，里面保留两三条记录

```
EXPLAIN SELECT * FROM employees_copy WHERE name in ('LiLei','HanMeimei','Lucy') AND age = 22 AND position ='manager
```

id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	SIMPLE	employe	(Null)	ALL	idx_name_age_position	(Null)	(Null)	(Null)	3	100	Using where

```
EXPLAIN SELECT * FROM employees_copy WHERE (name = 'LiLei' or name = 'HanMeimei') AND age = 22 AND position ='manag
```

信息 结果1 概况 状态

id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	SIMPLE	employe	(Null)	ALL	idx_name_age_position	(Null)	(Null)	(Null)	3	66.67	Using where

- **mysql 8**

```
EXPLAIN SELECT * FROM employees_copy WHERE name in ('LiLei','HanMeimei','Lucy') AND age = 22 AND position ='manager';
```

信息 结果 1 结果 2 剖析 状态

id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	SIMPLE	employees_copy	(Null)	range	idx_name_age_posit	idx_nan	140	(Null)	3	100.00	Using index con

```
EXPLAIN SELECT * FROM employees_copy WHERE (name = 'LiLei' or name = 'HanMeimei') AND age = 22 AND position ='manager';
```

信息 结果 1 结果 2 剖析 状态

id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	SIMPLE	employees_copy	(Null)	range	idx_name_age_posit	idx_name_age_posit	140	(Null)	2	100.00	Using index condit

mysql8中in和or在表记录不多的情况下也会走索引。

Order by与Group by优化

Case 6：

查询创建工具 查询编辑器

```
EXPLAIN select * from employees where name = 'zhuge' order by age asc,position desc;
```

信息 结果1 概况 状态

id	select_type	table	partitio	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	SIMPLE	employe	(Null)	ref	idx_name_age_position	idx_name_age_position	74	const	5061	100	Using index conditic

分析：

虽然排序的字段列与索引顺序一样，且order by默认升序，这里position desc变成了降序，导致与索引的排序方式不同，从而产生Using filesort。Mysql8以上版本有降序索引可以支持该种查询方式。

Mysql8降序索引示例

```
ALTER TABLE `employees_copy2` DROP INDEX `idx_name_age_position`;
ALTER TABLE `employees_copy2` ADD INDEX `idx_name_age_position` (`name`,`age`,`position` DESC) USING BTREE ;

EXPLAIN SELECT * FROM employees_copy2 WHERE name ='zhuge' order by age asc,position desc;
```

息 结果 1 剖析 状态

d	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	SIMPLE	employees_copy2	(Null)	ref	idx_name_age_posit	idx_nan	74	const	1	100.00	(Null)

Case 7：

- mysql8

filesort文件排序方式

MySQL8中max_length_for_sort_data默认4096字节