

MySQL索引简单例子

建表

index_a表只有主键, 无其他索引

```
mysql> create table index_a (
-> id int unsigned not null auto_increment,
-> title varchar(64) not null,
-> name varchar(16) not null,
-> stock int not null default 0,
-> create_time int not null default 0,
-> primary key (id)
-> );
```

Query OK, 0 rows affected (0.36 sec)

index_b表有主键和单列索引

```
mysql> create table index_b (
-> id int unsigned not null auto_increment,
-> title varchar(64) not null,
-> name varchar(16) not null,
-> sn varchar(12) not null default '',
-> stock int not null default 0,
-> create_time int not null default 0,
-> primary key (id),
-> unique key name(name) using btree,
-> unique key sn(sn) using btree
-> );
```

Query OK, 0 rows affected (0.58 sec)

index_c表有主键和组合索引

```
mysql> create table index_c (
-> id int unsigned not null auto_increment,
-> title varchar(64) not null,
-> name varchar(16) not null,
-> sn varchar(12) not null default '',
-> stock int not null default 0,
-> create_time int not null default 0,
-> primary key (id),
-> KEY name_sn_index(name, sn) using btree
-> );
```

Query OK, 0 rows affected (0.48 sec)

PHP脚本插入数据

```
<?php
```

```
// 三个表分别插入100w条数据
```

```
set_time_limit(0);
```

```
// 断掉连接 后台挂起
```

```
// fastcgi_finish_request();
```

```
$host = 'localhost';
```

```
$db = 'samp_db';
```

```
$user = 'samp';
```

```
$pass = 'samp';
```

```
$conn = new PDO('mysql:host='.$host.'.dbname='.$db, $user, $pass);
```

```
$sth = $conn->beginTransaction();
```

```
$sql = 'insert into index_a
(title, name, sn, stock, create_time)
values (?, ?, ?, ?, ?)'; # index_a另外换成index_b index_c
$sth = $conn->prepare($sql);
```

```
$time = strtotime('2010-01-01');
```

```
echo date('H:i:s') . '<br>';
```

```
for ($i = 1; $i < 1000000; $i++) {
// 设置当前第几个
$num = substr($i + 1000000, 1, 6);
// 插入数据
$sth->execute([
'title_', $num,
'name_', $num,
```

```
'sn_', $num,
    rand(1000, 2000),
    $time,
]);
$time += 50;
// 每1w条提交一次
if ($i % 10000 == 0) {
    $conn->commit();
    $conn->beginTransaction();
}
}
$conn->commit();
echo date('H:i:s');
```

索引简单测试

通过指定name分别查询

a表name无索引

b表name有单列索引

c表name有组合索引

```
mysql> set profiling=1;
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> select * from index_a where name='name_876543';
.....
```

```
mysql> select * from index_b where name='name_876543';
.....
```

```
mysql> select * from index_c where name='name_876543';
.....
```

```
mysql> show profiles;
```

Query_ID	Duration	Query
1	1.70158355	select * from index_a where name='name_876543'
2	0.00110591	select * from index_b where name='name_876543'
3	0.02820820	select * from index_c where name='name_876543'

3 rows in set (0.00 sec)

通过title查询

a b c三表title均无索引

```
mysql> select * from index_a where title = 'title_456789';
.....
```

```
mysql> select * from index_b where title = 'title_456789';
.....
```

```
mysql> select * from index_c where title = 'title_456789';
.....
```

```
mysql> show profiles; # 只显示相关
```

Query_ID	Duration	Query
4	0.51155937	select * from index_a where title = 'title_456789'
5	0.63892961	select * from index_b where title = 'title_456789'
6	0.54366214	select * from index_c where title = 'title_456789'

6 rows in set (0.00 sec)

测试like

a表name无索引

b表name有单列索引

c表name有组合索引

```
mysql> select * from index_a where name like '%www';
.....
```

```
mysql> select * from index_b where name like '%www';
.....
```

```
mysql> select * from index_c where name like '%www';
.....
```

```
mysql> select * from index_a where name like 'www%';
.....
```

```
mysql> select * from index_b where name like 'www%';
.....
```

```
mysql> select * from index_c where name like 'www%';
.....
```

```
mysql> show profiles;
```

Query_ID	Duration	Query
----------	----------	-------

1	3.31670231	select * from index_a where name like '%www'
2	3.24503318	select * from index_b where name like '%www'
3	3.53191539	select * from index_c where name like '%www'
4	3.58034354	select * from index_a where name like 'www%'
5	0.00045643	select * from index_b where name like 'www%'
6	0.00040764	select * from index_c where name like 'www%'

6 rows in set (0.00 sec)

综上: MySQL对于like 'www%' 索引有效, 对于'%www' 索引无效。

测试or

a 无索引

b name sn都有索引

c (name, sn) 组合索引

mysql> select * from index_a where name='name_556677' or sn = 'sn_667788';

mysql> select * from index_b where name='name_556677' or sn = 'sn_667788';

mysql> select * from index_c where name='name_556677' or sn = 'sn_667788';

.....

mysql> show profiles;

Query_ID	Duration	Query
1	0.59950080	select * from index_a where name='name_556677' or sn = 'sn_667788'
2	0.00161993	select * from index_b where name='name_556677' or sn = 'sn_667788'
3	0.60054383	select * from index_c where name='name_556677' or sn = 'sn_667788'

3 rows in set (0.00 sec)

综上: or需要条件都加索引才命中[bc表对比, ac表对比]

mysql> select * from index_a where name in ('name_111111', 'name_333333');

mysql> select * from index_b where name in ('name_111111', 'name_333333');

mysql> select * from index_c where name in ('name_111111', 'name_333333');

.....

2 rows in set (0.00 sec)

mysql> show profiles;

Query_ID	Duration	Query
1	0.63480784	select * from index_a where name in ('name_111111', 'name_333333')
2	0.00107901	select * from index_b where name in ('name_111111', 'name_333333')
3	0.00122203	select * from index_c where name in ('name_111111', 'name_333333')

3 rows in set (0.00 sec)

综上: in可以命中索引

测试范围符号(>, >=, <, <=, between)

先为index_b的stock加上索引

mysql> alter table index_b add index stock(stock);

Query OK, 0 rows affected (5.09 sec)

Records: 0 Duplicates: 0 Warnings: 0

MariaDB [samp_db]> select count(1) from index_a where stock > 1900;

MariaDB [samp_db]> select count(1) from index_b where stock > 1900;

MariaDB [samp_db]> select count(1) from index_c where stock > 1900;

MariaDB [samp_db]> select count(1) from index_a where stock between 1000 and 1050;

MariaDB [samp_db]> select count(1) from index_b where stock between 1000 and 1050;

MariaDB [samp_db]> select count(1) from index_c where stock between 1000 and 1050;

.....

MariaDB [samp_db]> show profiles;

Query_ID	Duration	Query
4	1.09335718	select count(1) from index_a where stock > 1900
5	0.05711385	select count(1) from index_b where stock > 1900
6	0.31060459	select count(1) from index_c where stock > 1900
7	0.34946092	select count(1) from index_a where stock between 1000 and 1050
8	0.03301252	select count(1) from index_b where stock between 1000 and 1050
9	0.31163826	select count(1) from index_c where stock between 1000 and 1050

```
9 rows in set (0.00 sec)
# 通过时间对比, 以及explain, 比较符, between可以命中索引[不全面]
# 测试and
MariaDB [samp_db]> select * from index_a where name='name_555666' and sn='sn_777888';
.....
MariaDB [samp_db]> select * from index_b where name='name_555666' and sn='sn_777888';
.....
MariaDB [samp_db]> select * from index_c where name='name_555666' and sn='sn_777888';
.....
MariaDB [samp_db]> show profiles;
```

Query_ID	Duration	Query
1	0.61768279	select * from index_a where name='name_555666' and sn='sn_777888'
2	0.00109431	select * from index_b where name='name_555666' and sn='sn_777888'
3	0.00079209	select * from index_c where name='name_555666' and sn='sn_777888'

```
3 rows in set (0.00 sec)
# 综上: 单列以及组合所以可以命中 「最左前缀匹配原则」
```