《数据库系统实验》

实验报告

题目	实验七
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一. 实验环境：
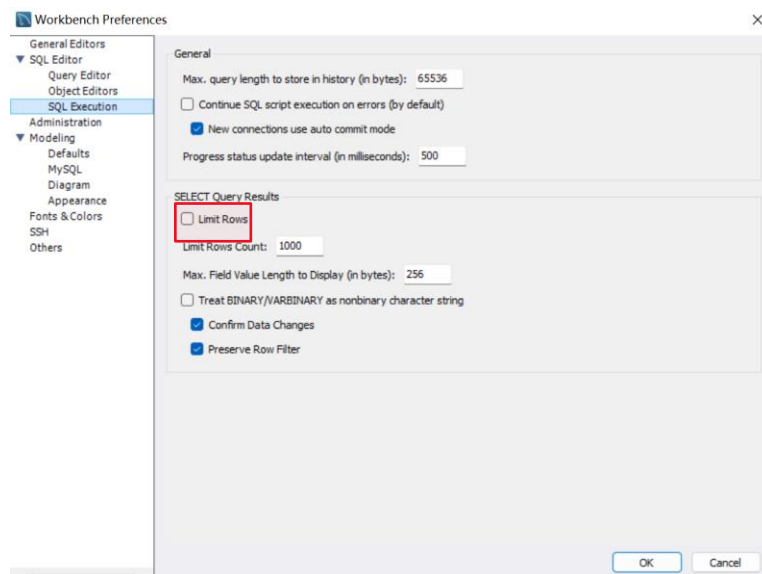
操作系统：Windows64 位

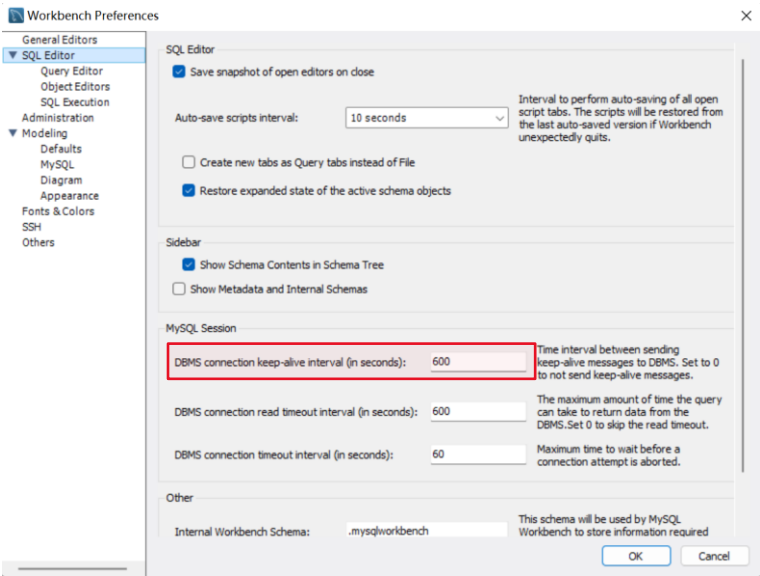图形界面：MySQL Workbench

二. 实验内容与完成情况：

1. 创建 test 表

代码：

```
create table if not exists test(
id int unique auto_increment, --  默认自增
rq datetime null,
srq varchar(20) null,
hh smallint null,
mm smallint null,
ss smallint null,
num numeric(12,3),
primary key(id)
)auto_increment=1 engine=MyISAM;
```

2. 创建过程 p1，用于向 test 表中插入 80000 条记录

取消查询行数限制

提高数据库连接的超时时间为 600s，否则过程 p1 会执行失败

代码：

```
delimiter //
create procedure if not exists p1()
begin
    set @i=1;
    while @i<=80000 do
        insert into test(rq,srq,hh,mm,ss,num)
            values (now(),now(),hour(now()),

    minute(now()),second(now()),rand(@i)*100);
        set @i=@i+1;
    end while;
end //


call p1//
delimiter ;
```

查看 test 表结果：

id	rq	srq	hh	mm	ss	num
1	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	40.540
2	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	65.559
3	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	90.577
4	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	15.595
5	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	40.614
6	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	65.632
7	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	90.650
8	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	15.669
9	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	40.687
10	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	65.705
11	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	90.723
12	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	15.742
13	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	40.760
14	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	65.778
15	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	90.797
16	2024-11-29 17:37:53	2024-11-29 17:37:53	17	37	53	15.815

id	rq	srq	hh	mm	ss	num
79987	2024-11-29 17:39:28	2024-11-29 17:39:28	17	39	28	55.158
79988	2024-11-29 17:39:28	2024-11-29 17:39:28	17	39	28	80.176
79989	2024-11-29 17:39:28	2024-11-29 17:39:28	17	39	28	5.194
79990	2024-11-29 17:39:28	2024-11-29 17:39:28	17	39	28	30.212
79991	2024-11-29 17:39:28	2024-11-29 17:39:28	17	39	28	55.231
79992	2024-11-29 17:39:28	2024-11-29 17:39:28	17	39	28	80.249
79993	2024-11-29 17:39:28	20 2024-11-29 17:39:28		39	28	5.267
79994	2024-11-29 17:39:28	2024-11-29 17:39:28	17	39	28	30.286
79995	2024-11-29 17:39:28	2024-11-29 17:39:28	17	39	28	55.304
79996	2024-11-29 17:39:28	2024-11-29 17:39:28	17	39	28	80.322
79997	2024-11-29 17:39:28	2024-11-29 17:39:28	17	39	28	5.341
79998	2024-11-29 17:39:28	2024-11-29 17:39:28	17	39	28	30.359
79999	2024-11-29 17:39:28	2024-11-29 17:39:28	17	39	28	55.377
80000	2024-11-29 17:39:28	2024-11-29 17:39:28	17	39	28	80.396
NULL	NULL	NULL	NULL	NULL	NULL	NULL

3. 未建索引时按以下步骤操作

（1）单记录插入

代码：

```
select @i:=max(id) from test;
insert into test(rq,srq,hh,mm,ss,num)
        values (now(),now(),hour(now()),
        minute(now()),second(now()),rand(@i)*100);
```

执行结果：

id	rq	srq	hh	mm	ss	num
79989	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	5.194
79990	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	30.212
79991	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	55.231
79992	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	80.249
79993	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	5.267
79994	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	30.286
79995	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	55.304
79996	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	80.322
79997	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	5.341
79998	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	30.359
79999	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	55.377
80000	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	80.396
80001	2024-11-29 17:53:04	2024-11-29 17:53:04	17	53	4	80.396
NULL	NULL	NULL	NULL	NULL	NULL	NULL

⚠ 7 17:53:04 insert into test(rq,srq,hh,mm,ss,num) values (now(),now(),hour(now()), minute(now()),second(now()),rand... 1 row(s) affected, 1 warning(s): 1265 Data truncated for column 'num' at row 1   0.000 sec

用时 0.000s

（2）查询所有记录，按 id 排序

代码：

```
select * from test order by id;
```

执行时间：

✓ 8 20:20:20 select * from test order by id   80001 row(s) returned   0.297 sec / 0.031 sec

用时 0.297s

（3）查询所有记录，按 mm 排序

代码：

```
select * from test order by mm;
```

执行时间：

✓	9 20:48:00 select * from test order by mm	80001 row(s) returned	0.328 sec / 0.031 sec

用时 0.328s

（4）单记录查询

代码：

```
select id from test where id=51;
```

执行结果：

	id
▶	51
＊	NULL

✓	10 20:51:28 select id from test where id=51	1 row(s) returned	0.000 sec / 0.000 sec

用时 0.000s

4. 对 test 表的 mm 字段建立非聚集索引

（1）建立索引耗时

代码：

```
create index indexname1 on test(mm);
```

执行结果：

查看 test 的索引表

Show index from test;

test	1	indexname1	1	mm	A	3	NULL	NULL	YES	BTREE		YES	NULL

执行时间：

✓	11 20:59:53 create index indexname1 on test(mm)	80001 row(s) affected Records: 80001 Duplicates: 0 Warnings: 0	0.765 sec

用时 0.765s

（2）单记录插入

代码：

```
select @i:=max(id) from test;
insert into test(rq,srq,hh,mm,ss,num)
    values (now(),now(),hour(now()),
    minute(now()),second(now()),rand(@i)*100);
```

执行结果：

id	rq	srq	hh	mm	ss	num
79991	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	55.231
79992	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	80.249
79993	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	5.267
79994	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	30.286
79995	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	55.304
79996	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	80.322
79997	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	5.341
79998	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	30.359
79999	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	55.377
80000	2024-11-29 17:52:30	2024-11-29 17:52:30	17	52	30	80.396
80001	2024-11-29 17:53:04	2024-11-29 17:53:04	17	53	4	80.396
80002	2024-11-29 21:14:28	2024-11-29 21:14:28	21	14	28	5.414
NULL	NULL	NULL	NULL	NULL	NULL	NULL

⚠ 14 21:14:28 insert into test(rq,srq,hh,mm,ss,num) values (now(),now(),hour(now()), minute(now()),second(now()),ra... 1 row(s) affected, 1 warning(s): 1265 Data truncated for column 'num' at row 1   0.000 sec

用时 0.000s

（3）查询所有记录，按 id 排序
代码：

```
select * from test order by id;
```

执行时间：

✅ 15 21:20:40 select * from test order by id   80002 row(s) returned   0.282 sec / 0.031 sec

用时：0.282s<0.297s，用时减少

（4）查询所有记录，按 mm 排序
代码：

```
select * from test order by mm;
```

执行时间：

✅ 16 21:23:06 select * from test order by mm   80002 row(s) returned   0.281 sec / 0.031 sec

用时 0.281s<0.328s，用时减少

（5）单记录查询
代码：

```
select id from test where id=51;
```

执行结果：

id
51
NULL

✅ 17 21:24:57 select id from test where id=51   1 row(s) returned   0.000 sec / 0.000 sec

用时 0.000s

（6）删除索引
代码：

```
drop index indexname1 on test;
```

执行结果：

查看 test 的索引表

Show index from test;

	Table	Non_unique	Key_name	Seq_in_index	Column_name	Collation	Cardinality	Sub_part	Packed	Null	Index_type	Comment	Index_comment	Visible	Expr
▶	test	0	PRIMARY	1	id	A	80000	NULL	NULL		BTREE			YES	NULL
	test	0	id	1	id	A	80000	NULL	NULL		BTREE			YES	NULL

执行时间

⊘	18 21:26:56	drop index indexname1 on test	80002 row(s) affected Records: 80002 Duplicates: 0 Warnings: 0	0.609 sec

用时 0.609s

查看 test 的索引表

Show index from test;