数据库系统实验 6 实验报告

数据科学与计算机学院 计算机科学与技术 2016 级
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1 实验 6 存储过程实验

1.1 无参数的存储过程

定义一个存储过程，根据选课记录更新所有学生的绩点。

```
delimiter //
create procedure Proc_CalCred()
begin
    set SQL_SAFE_UPDATES = 0;
    update student
    set tot_cred = (
        select sum(credits)
        from takes natural join course
        where (takes.grade is not null) and takes.grade <> 'F' and student.ID =
            takes.ID
    );
    set SQL_SAFE_UPDATES = 1;
end //
delimiter ;
```

执行存储过程 Proc_CalCred 。

```
CALL `lab`.`Proc_CalCred`();
```

1.2 有参数的存储过程

定义一个存储过程，根据选课记录更新指定学生（学号）的绩点。

```
delimiter //
create procedure Proc_CalCred4Student(stu varchar(5))
begin
    update student
    set tot_cred = (
        select sum(credits)
        from takes natural join course
        where (takes.grade is not null) and takes.grade <> 'F' and student.ID =
            takes.ID
```

```
    )
    where student.ID = stu;
end //
delimiter ;
```

执行存储过程。

```
CALL `lab`.`Proc_CalCred4Student`('1000');
```

1.3 有局部变量的存储过程

定义一个存储过程，根据选课记录更新指定学生（姓名）的绩点。

```
delimiter //
create procedure Proc_CalCred4Student_2(stu_name varchar(20))
begin
    declare idkey varchar(5);
    select ID into idkey
    from student
    where name = TRIM(stu_name);
    update student
    set tot_cred = (
        select sum(credits)
        from takes natural join course
        where (takes.grade is not null) and takes.grade <> 'F' and student.ID =
            takes.ID
    )
    where student.ID = idkey;
end //
delimiter ;
\end{lstlisitng}

执行存储过程。

\begin{lstlisting}[language=sql]
CALL `lab`.`Proc_CalCred4Student_2`('Manber');
```

查看存储过程执行结果。

```
select tot_cred from student where name = 'Manber';
```

1.4 有输出参数的存储过程

定义一个存储过程，根据选课记录更新指定学生（姓名）的绩点。

```
delimiter //
create procedure Proc_CalCred4Student_3(stu_name varchar(20), out cred decimal(3,0))
begin
    declare idkey varchar(5);
    select ID into idkey
    from student
```

```
    where name = TRIM(stu_name);
    update student
    set tot_cred = (
        select sum(credits)
        from takes natural join course
        where (takes.grade is not null) and takes.grade <> 'F' and student.ID =
            takes.ID
    )
    where student.ID = idkey;
    select tot_cred into cred
    from student
    where ID = idkey;
end //
delimiter ;
```

执行存储过程。

```
CALL `lab`.`Proc_CalCred4Student_3`('Manber', @a);
select @a;
```

结果如下：

```
+------+
| @a   |
+------+
|   42 |
+------+
1 row in set (0.01 sec)
```

检查下列 SQL 语句执行结果与上述结果是否一致。

```
select sum(credits)
from takes natural join course natural join (select ID, name from student) as stu
where (takes.grade is not null) and takes.grade <> 'F' and stu.ID = takes.ID and stu
    .name = 'Manber';
```

结果如下：

```
+--------------+
| sum(credits) |
+--------------+
|           42 |
+--------------+
1 row in set (0.01 sec)
```

1.5 删除存储过程

```
drop procedure `Proc_CalCred4Student_3`;
```

执行存储过程。

```
CALL `lab`.`Proc_CalCred4Student_3`('Manber');
```

执行结果

```
ERROR 1305 (42000): PROCEDURE lab.Proc_CalCred4Student_3 does not exist
```

1.6 实验总结

存储过程实际上是将重复性很高的一些操作，封装到一个存储过程中，从而简化了 SQL 的调用。对于大量的查询操作，可以减少 SQL 语句的传输，从而减少流量。存储过程的接口都是统一的，并且不会暴露数据库的结构，能确保数据的安全。