

## #1: procedure ADD\_STUDENT

The screenshot shows the MySQL Workbench interface with the SQL Editor open. The SQL Editor contains the following code:

```
1 #1: procedure ADD_STUDENT
2 describe sinhvien;
3 select * from sinhvien;
4
5 delimiter $
6
7 create procedure ADD_STUDENT( mssv char(8),
8                               hoten varchar(45),
9                               gioiTinh char(1),
10                              ngaySinh date,
11                              noiSinh varchar(40),
12                              diaChi varchar(100),
13                              maKhoa char(8))
14 begin
15     insert into sinhvien values (mssv, hoten, gioiTinh, ngaySinh, noiSinh, diaChi, maKhoa);
16 end$
17
18 call ADD_STUDENT('A2111992', 'Ngô Thanh Nam', 'M', '2003-12-30', 'Cần Thơ', 'Kiên Giang', 'cntt&tt')$
19
20 #2: procedure DEL_STUDENT
21 delimiter $
22
23 select * from sinhvien$
24 select * from ketqua$
25
```

The Output window shows the results of the execution:

Time	Action	Message	Duration / Each
106.10:59.02	show AVG_GRADE(S12345678)	1 row(s) returned	0.000 sec / 0.000 sec
107.11:00.73	call ADD_STUDENT(A2111992, 'Ngô Thanh Nam', 'M', '2003-12-30', 'Cần Thơ', 'Kiên Giang', 'cntt&tt')	1 row(s) affected	0.047 sec

## #2: procedure DEL\_STUDENT

The screenshot shows the MySQL Workbench interface with the SQL Editor open. The SQL Editor contains the following code:

```
20 #2: procedure DEL_STUDENT
21 delimiter $
22
23 select * from sinhvien$
24 select * from ketqua$
25
26 create procedure DEL_STUDENT(mssv char(8))
27 begin
28     if exists(select mssv from sinhvien where sinhvien.mssv = mssv)
29     then
30         delete from ketqua where ketqua.mssv = mssv;
31         delete from sinhvien where sinhvien.mssv = mssv;
32     end if;
33 end$
34
35 call DEL_STUDENT('B2111992')$
36
37 #3: procedure AVG_GRADE
38 delimiter $
39
40
41 create procedure AVG_GRADE(IN mssv char(8), OUT diemtb double)
42 begin
43     if exists(select mssv from sinhvien where sinhvien.mssv = mssv)
44     then
```

The Output window shows the results of the execution:

Time	Action	Message	Duration / Each
107.11:00.13	call ADD_STUDENT(A2111992, 'Ngô Thanh Nam', 'M', '2003-12-30', 'Cần Thơ', 'Kiên Giang', 'cntt&tt')	1 row(s) affected	0.047 sec
108.11:01.27	call DEL_STUDENT(B2111992)	1 row(s) affected	0.047 sec

### #3: procedure AVG\_GRADE

The screenshot shows the MySQL Workbench interface. The SQL Editor contains the following code for creating and executing a procedure:

```
#3: procedure AVG_GRADE
delimiter $
create procedure AVG_GRADE(IN mssv char(8), OUT diemtb double)
begin
  if exists(select mssv from sinhvien where sinhvien.mssv = mssv)
  then
    set diemtb = (select sum(diem*soTinChi)/sum(soTinChi)
                  from ketqua k inner join hocphan h on k.maHP = h.maHP
                  where k.mssv = mssv);
  else
    set diemtb = -1;
  end if;
end$
set @diemtb = 0;
call AVG_GRADE('B1456789', @diemtb);
select @diemtb;
```

The Results window shows the output of the procedure call:

Time	Action	Message	Duration / Feat
110 11:02:00	call AVG_GRADE('B1456789', @diemtb)	0 row(s) affected	0.000 sec
110 11:02:11	select @diemtb	1 row(s) returned	0.000 sec / 0.000 sec

### #4: function AVG\_GRADE

The screenshot shows the MySQL Workbench interface. The SQL Editor contains the following code for creating and executing a function:

```
#4: function AVG_GRADE
delimiter $
create function AVG_GRADE(mssv char(8))
returns double
begin
  if exists(select mssv from sinhvien where sinhvien.mssv = mssv)
  then
    return (select sum(diem*soTinChi)/sum(soTinChi)
            from ketqua k inner join hocphan h on k.maHP = h.maHP
            where k.mssv = mssv);
  else
    return -1;
  end if;
end$
select AVG_GRADE('B1234568');
```

The Results window shows the output of the function call:

Time	Action	Message	Duration / Feat
111 11:04:22	select AVG_GRADE('B1234568')	1 row(s) returned	0.000 sec / 0.000 sec

## #5: procedure AVG\_GRADE\_DEPT

The screenshot displays the MySQL Workbench interface with the SQL Editor open. The editor contains the following SQL code:

```
77 #5: procedure AVG_GRADE_DEPT
78
79 delimiter $
80
81 desc khoa$
82
83 create procedure AVG_GRADE_DEPT(makhoa char(8))
84 begin
85     select s.mssv, hoten, AVG_GRADE(kq.mssv)
86     from sinhvien s inner join khoa k on s.makhoa = k.makhoa
87     inner join ketqua kq on kq.mssv = s.mssv
88     where s.makhoa = makhoa
89     group by s.mssv;
90 end$
91
92 call AVG_GRADE_DEPT('cntt&tt')$
93
```

The Object Browser on the left shows the database structure, including tables like `sinhvien`, `khoa`, and `ketqua`. The Information tab at the bottom shows the execution results of the procedure call, which returned 1 row.

mssv	hoten	AVG_GRADE(kq.mssv)
B1234567	Nguyen Thanh Mai	2.7142857142857142
B1234568	Tran Thanh Mai	8.571428571428571
B1234569	Tran Thu Thuy	8.428571428571429
B1345679	Tran Hoang Yen	3.2857142857142858
B1345678	Tran Hong Truc	6

The Output tab at the bottom shows the execution details:

Time	Action	Message	Duration / Feat
111 11:04:27	select AVG_GRADE(B1234568)	1 row(s) returned	0.000 sec / 0.000 sec
112 11:04:50	call AVG_GRADE_DEPT(cntt&tt)	5 row(s) returned	0.000 sec / 0.000 sec