# INFO90002 Week 8 Lab

## Objectives:

- In this week's lab you will test how referential integrity works in MySQL using foreign keys.

## Section 1: Referential Integrity

In the following section you will be creating four tables and testing the PK-FK integrity constraints between and within tables.

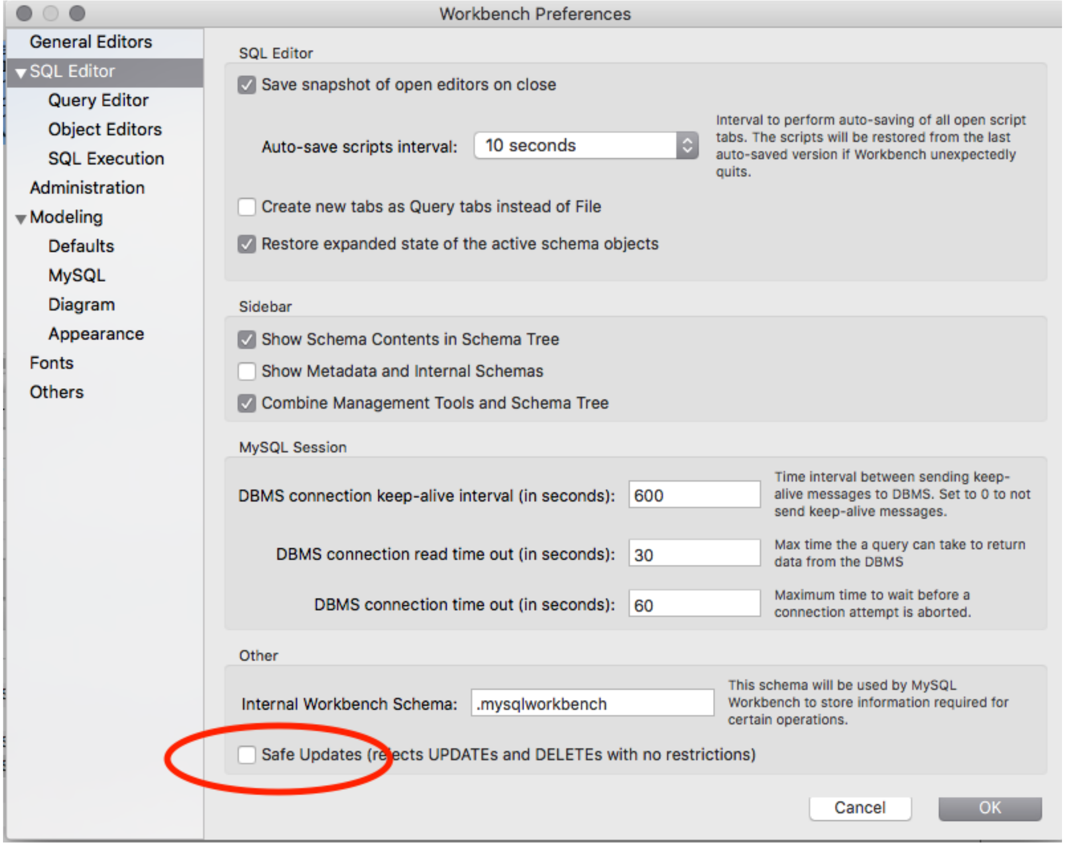
### PREREQUISITE:

Please ensure that you have disabled SAFE UPDATES in the Preferences

ON Windows MySQL Worksheet

EDIT→ PREFERENCES→SQL EDITOR->OTHER

Uncheck the  safe update check box.



SQL Editor

☑ Save snapshot of open editors on close

Auto-save scripts interval: 10 seconds

Interval to perform auto-saving of all open script tabs. The scripts will be restored from the last auto-saved version if Workbench unexpectedly quits.

□ Create new tabs as Query tabs instead of File

☑ Restore expanded state of the active schema objects

Sidebar

☑ Show Schema Contents in Schema Tree

□ Show Metadata and Internal Schemas

☑ Combine Management Tools and Schema Tree

MySQL Session

DBMS connection keep-alive interval (in seconds): 600

Time interval between sending keep-alive messages to DBMS. Set to 0 to not send keep-alive messages.

DBMS connection read time out (in seconds): 30

Max time the a query can take to return data from the DBMS

DBMS connection time out (in seconds): 60

Maximum time to wait before a connection attempt is aborted.

Other

Internal Workbench Schema: .mysqlworkbench

This schema will be used by MySQL Workbench to store information required for certain operations.

□ Safe Updates (rejects UPDATEs and DELETEs with no restrictions)

*Figure 1 Screenshot of MySQL Workbench SQL Editor Preferences window*

### 1.1. Connect to your MySQL database hosted on the engineering server

1.2 On LMS in the LABS (practical) folder and download the SQL script scott.sql and install the Scott-Tiger tables by running the script scott.sql from MYSQL Workbench

FILE -> OPEN SQL SCRIPT

The "Scott-Tiger" script has installed 4 tables and populated three of them, EMP, DEPT and SALGRADE. However, the install script has not added the foreign key relationship between EMP & DEPT table using the deptno column.

1.3. Add the Foreign Key constraint in the EMP table which references the Primary Key in the DEPT table.

```
ALTER TABLE EMP
ADD CONSTRAINT FK_DEPT
FOREIGN KEY (deptno) REFERENCES DEPT(deptno)
ON DELETE CASCADE
ON UPDATE CASCADE
;
```

Now query the information_schema (the meta data also known as a data dictionary) to see the constraints

```
SELECT *
FROM information_schema.table_constraints
WHERE TABLE_NAME in ('emp', 'dept');
```

The organisation has decided to invest in the movie business and has hired the director Stephen Soderbergh

1.4. Write an insert statement to add a row to the EMP table.

| Column | Value: |
|---|---|
| empno | 8182 |
| name | SODERBERGH |
| job | DIRECTOR |
| boss | 7839 |
| hiredate | 2012-08-25 |
| salary | 8000 |
| comm | NULL |
| deptno | NULL |

HINT: Insert statements look something like this

```
INSERT INTO TABLE
VALUES (Col1, Col2, Col3, Col4, Col5, Col6, Col7, Col8);
```

Answer:

```
INSERT INTO EMP
```

```
VALUES (8182, 'SODERBERGH', 'DIRECTOR', 7839, '2012-08-25',8000,
NULL, NULL);
```

Note that currently we have not assigned a department number (deptno) to Steven Soderbergh.

A decision has been made to assign Steven Soderbergh to the new MOVIES department.

1.5. Update Steven Soderbergh's record in the EMP table so that he is in deptno 50.

```
UPDATE EMP
SET DEPTNO=50
WHERE NAME = 'SODERBERGH';
```

What happened? Why did it happen? What is Steven Soderbergh's current department number in the EMP table?

```
SELECT DepartmentID
FROM employee
WHERE NAME = 'SODERBERGH';
```

A referential integrity error occurred. The Foreign Key constraint did not allow the update as there is no department 50 in the DEPT table

Add the MOVIE department to the DEPT table:

1.6. Insert the following values into the DEPT table

| Column Name: | Value: |
|---|---|
| deptno | 50 |
| name | MOVIE |
| location | HOLLYWOOD |

```
INSERT INTO DEPT
VALUES (50,'MOVIE','HOLLYWOOD');
```

1.7. Now repeat question 5 and update Soderbergh's department to 50. Did this succeed? Why did it succeed?

It succeeded because there is a Primark Key row in DEPT table that has a value that matches the Foreign key value in the EMP table.

1.8. Add the Boss/Employee Foreign Key to the EMP table. Name the relationship FK_Boss

*HINT: Refer to the syntax in Q2.3 to write the Boss Employee foreign key / primary key relationship.*

```
ALTER TABLE EMP
ADD CONSTRAINT FK_BOSS
FOREIGN KEY (boss) REFERENCES EMP(empno)
ON DELETE CASCADE
ON UPDATE CASCADE
;
```

Query the information_schema meta data to see the table constraints on the EMP & DEPT tables

```
SELECT *
FROM information_schema.table_constraints
WHERE TABLE_NAME in ('emp', 'dept');
```

The business has recruited its first actor Jennifer Lawrence and Jennifer will be making a movie with Steven Soderbergh.

1.9 Write an INSERT statement to add Jennifer Lawrence's information to the EMP table

| Column | Value: |
|---|---|
| empno | 8385 |
| name | LAWRENCE |
| job | ACTOR |
| boss | 8182 |
| hiredate | 2012-08-28 |
| salary | 8500 |
| comm | NULL |
| deptno | 50 |

```
INSERT INTO EMP
VALUES (8385, 'LAWRENCE', 'ACTOR',8182, '2012-08-28',8500, NULL,
50):
```

Confirm that both Soderbergh and Lawrence are both in department 50 'Hollywood'.

1.10 Write a query.to retrieve the employee number, name, their manager's employee number, department number and their department name for all employees in department 50.

```
SELECT empno, emp.name, boss, deptno, dept.name
FROM EMP inner join DEPT
ON Emp.Deptno = Dept.Deptno
WHERE Emp.Deptno = 50;
```

The President Mr King has decided to that number 50 is bad luck and want's the movie department to be department number 60.

1.11 Update the MOVIE department in the DEPT table so it is now department number (deptno) 60.

```
UPDATE DEPT
SET DEPTNO = 60
```

```
WHERE DEPTNO=50;
```

1.12 Rerun the query you wrote in 2.10. Is there any differences to your result set? Why?

*HINT: Because we had cascade on the foreign key constraint the change to the primary key has been applied to all foreign keys referencing the primary key.*

```
SELECT empno, emp.name, boss, deptno, dept.name
FROM EMP inner join DEPT
ON Emp.Deptno = Dept.Deptno
WHERE Emp.Deptno = 50;
```

There are no rows returned. This is because the constraint has updated the foreign key records in the EMP table

1.13 Change your query so that you return all employees in department (deptno) 60.

```
SELECT empno, emp.name, boss, deptno, dept.name
FROM EMP inner join DEPT
ON Emp.Deptno = Dept.Deptno
WHERE Emp.Deptno = 60;
```

Stephen Soderbergh has been fired over creative differences with the president of the company Mr King. Mr King has demanded that Soderbergh be deleted from the EMP table.

1.14 Write the delete statement to remove Soderbergh from the EMP table

What happened? Why did it happen?

```
DELETE FROM EMP
WHERE Name = 'SODERBERGH';
```

An error occurred because there are foreign key records referencing the Soderbergh record.

1.15. Update the record or records that need to be changed before we can delete Soderbergh from the Emp table, then delete Soderbergh from the EMP table.

```
UPDATE EMP
SET BOSS=7839
WHERE NAME = 'LAWRENCE'
COMMIT;
DELETE FROM EMP
WHERE Name = 'SODERBERGH';
```

1.16 USING DDL Drop the DEPT, EMP, SALGRADE and BONUS tables in that order

```
DROP TABLE DEPT;
DROP TABLE EMP;
DROP TABLE SALGRADE;
DROP TABLE BONUS;
```

End of Week 8 Lab