COMP 3311: Database Management Systems

Lab 4 Exercise: Simple SQL DDL, DML and Constraint Statements

HOW TO GET THE CREDIT FOR THIS LAB

1. **Download** the zipped folder Lab4Exercise.zip from the ***Simple SQL DDL, DML and Constraint Statements*** entry of the Lab Schedule course webpage and **unzip** it. The folder contains three script files Lab4.sql, Lab4Constraints.sql and Lab4TestQueries.sql.

2. **Place** your InsertMyself.sql script file <u>inside</u> the Lab4Exercise folder and **modify** it to insert the following tuples.
   a. Into the Student table, an additional tuple with the following values.
      • Your student id, first name, last name and HKUST email address.
      • Any phone number of your choosing (it does not have to be your phone number).
      • The value "3.57" for the cga attribute.
      • The value "COMP" for the departmentId attribute.
      • The value "2015" for the admissionYear attribute.
   b. Into the EnrollsIn table, five additional tuples with the following values. ← <mark>NEW!</mark>

studentId	courseId	grade
<your student id>	COMP3311	95.6
<your student id>	COMP4021	88.3
<your student id>	ELEC3100	93.1
<your student id>	HUMA1020	88.4
<your student id>	MATH2421	90.5

3. **Edit** the Lab4Constraints.sql script file by editing the alter table statements in the file to do the following.
   a. For the Student, Course, Facility and EnrollsIn tables, add foreign key referential integrity constraints.
   b. For the Department table, add a constraint to check that departmentId has only a value in the set {BUS, COMP, ELEC, HUMA, MATH}.
   c. For the Student table, add constraints to (i) enforce the uniqueness of email values; (ii) check that studentId and phoneNo have exactly 8 digits only; (iii) check that cga has a value between 0 and 4; and (iv) check that admissionYear begins with a 2 and has exactly 4 digits only.
   d. For the Course table, add a constraint to check that courseId follows the pattern of exactly four letters followed by exactly four digits.
   e. For the EnrollsIn table, add a constraint to check that grade has a value between 0 and 100.

4. **Execute** the Lab4.sql script file in SQL Developer. The two lines starting with the @ symbol in the Lab4.sql script file cause the referenced InsertMyself.sql and Lab4Constraints.sql script files to be executed.
   <mark>Note:</mark> A referenced script file <u>must</u> reside in the same folder as the script file that references it.

5. **Execute** the Lab4TestQueries.sql script file in SQL Developer.
   <mark>Note:</mark> If the constraints are not correctly defined, then executing the Lab4TestQueries.sql script file will insert tuples into the tables that violate the constraints. In this case, after making corrections to your Lab4Constraints.sql script file, you will need to execute the Lab4.sql script file again <u>before</u> executing the Lab4TestQueries.sql script file.

WHAT TO SUBMIT

1. Your modified Lab4Constraints.sql script file.
2. A text file named Lab4Output.txt containing the result of executing the Lab4TestQueries.sql script file. The Lab4Output.txt file can be created by saving the SQL Developer Script Output pane to a file with this name. The expected result of executing the Lab4TestQueries.sql script file is shown in Figure 1.

HOW TO SUBMIT

By 11:59 p.m. on Friday of the current week, upload your Lab4Constraints.sql script file and Lab4Output.txt text file to Canvas by selecting "Lab 4" in the Assignments section of Canvas, and then selecting the "Submit Assignment" button. To check your submission, select the "Submission Details" button on the right side. For help, select the "Help" button at the top-right of Canvas.

Lab 4 Exercise: Simple SQL DDL, DML and Constraint Statements

```
Script Output  ×
★ ⬤ 🖫 🖨 📄 | Task completed in 0.769 seconds
STUDENTI FIRSTNAME           LASTNAME              AVGGRADE
-------- -------------------- --------------------- ----------
11111111 Typical              Student                   91.18
26186666 Warren               Buffet                     88.2
13556789 Legolas              Greenleaf                  87.1


*** REFERENTIAL INTEGRITY CONSTRAINTS VIOLATED ***

Error starting at line : 24 in command -
insert into Student values ('22222222', '*** Student ***', 'RI: No matching dept id', 'afong', '22223334', 0.00, 'PHYS', '2016')
Error report -
ORA-02291: integrity constraint (COMP3311STU000.SYS_C00220780) violated - parent key not found

Error starting at line : 26 in command -
insert into Student values ('33333333', '*** Student ***', 'RI: Dept id cannot be null', 'jchan', '23321334', 0.00, null, '2016')
Error report -
ORA-12899: value too large for column "COMP3311STU000"."STUDENT"."LASTNAME" (actual: 26, maximum: 25)

*** Cascade delete test on Student table should succeed with 1 row deleted and no rows selected ***

1 row deleted.
no rows selected

Error starting at line : 36 in command -
insert into Course values ('PHYS4311', '*** ', '*** Course ***', 'RI: No matching dept id')
Error report -
ORA-02291: integrity constraint (COMP3311STU000.SYS_C00220781) violated - parent key not found

Error starting at line : 40 in command -
insert into Facility values ('CHEM', '*** Facility *** RI: No matching dept id', 2, 5)
Error report -
ORA-02291: integrity constraint (COMP3311STU000.SYS_C00220782) violated - parent key not found

Error starting at line : 44 in command -
insert into EnrollsIn values ('13456789', 'PHYS4311', 80.6)
Error report -
ORA-02291: integrity constraint (COMP3311STU000.SYS_C00220784) violated - parent key not found

Error starting at line : 46 in command -
insert into EnrollsIn values ('99999999', 'COMP3311', 75.6)
Error report -
ORA-02291: integrity constraint (COMP3311STU000.SYS_C00220783) violated - parent key not found


*** CHECK CONSTRAINTS VIOLATED ***

Error starting at line : 55 in command -
insert into Department values ('DEPT','*** Department table: Dept id invalid','0000')
Error report -
ORA-02290: check constraint (COMP3311STU000.CHK_DEPARTMENTID) violated

Error starting at line : 58 in command -
insert into Student values ('44444444', '*** Student table:', 'CHK: Email not unique', 'cs_grande', '22223334', 0.00, 'COMP', '2016')
Error report -
ORA-00001: unique constraint (COMP3311STU000.CHK_EMAIL) violated

Error starting at line : 61 in command -
insert into Student values ('234567*9', '*** Student table:', 'CHK: Student id invalid', 'afong', '22223334', 0.00, 'COMP', '2016')
Error report -
ORA-02290: check constraint (COMP3311STU000.CHK_STUDENTID) violated

Error starting at line : 64 in command -
insert into Student values ('55555555', '*** Student table:', 'CHK: CGA out of range', 'ali', '25524334', 4.50, 'COMP', '2016')
Error report -
ORA-02290: check constraint (COMP3311STU000.CHK_CGA) violated

Error starting at line : 67 in command -
insert into course values ('comp3311','COMP','** Course Table: CHK: invalid course id','Test Man')
Error report -
ORA-02290: check constraint (COMP3311STU000.CHK_COURSEID) violated

Error starting at line : 70 in command -
insert into EnrollsIn values ('99987654', 'COMP3311', 100.1)
Error report -
ORA-02290: check constraint (COMP3311STU000.CHK_GRADE) violated
```

> **Your information should be shown in the result of this query.**

Figure 1: Example Script Output pane showing the result of executing the Lab4TestQueries.sql script file.