East West University
Department of Computer Science and Engineering

CSE302: Lab 02 Handout
Course Instructor: Md Al-Imran

Intermediate level DDL and simple DML statements

Lab Objective

Familiarize students with intermediate level DDL commands and simple DML statements in SQL.

Lab Outcome

After completing this lab successfully, students will be able to:

1. Understand and execute DDL commands to define integrity constraints and modify the database schema.
2. Construct DML statements to perform queries involving distinct keyword, generalized projection, simple multi-table queries and so on.

Psychomotor Learning Levels

This lab involves activities that encompass the following learning levels in psychomotor domain.

Level	Category	Meaning	Keywords
P1	Imitation	Copy action of another; observe and replicate.	Relate, Repeat, Choose, Copy, Follow, Show, Identify, Isolate.
P2	Manipulation	Reproduce activity from instruction or memory	Copy, response, trace, Show, Start, Perform, Execute, Recreate.

Lab Activities:

1. **Schema Definition along with Integrity Constraints**

```
CREATE TABLE <table_name>
(
  <attribute_name1> <datatype> [NOT NULL],
  <attribute_name2> <datatype> [NOT NULL],
  ...,
  [constraint <constraint_name>] primary key (<attribute_name,…>),
  [constraint <constraint_name>] foreign key (<attribute_name,…>)
references <parent_table_name>(<attribute>) [ON DELETE CASCADE]),
  [constraint <constraint_name>] check (<condition>)
);
```

   Task:

   - *Create department relation with dept_name, building and budget attributes where dept_name must be the primary key and budget must be positive.*
   - *Create another relation course with course_id, title, dept_name and credits where course_id is the primary key, dept_name is the foreign key and credits must be greater than or equal to 1.*

2. **Schema Modification**

   Adding a new attribute:

```
    ALTER TABLE <table_name> ADD <attribute_name> <datatype>;
```

   Dropping an attribute:

```
    ALTER TABLE <table_name> DROP column <attribute_name>;
```

   Modifying data type of an attribute (Column must be empty/has no values):

```
    ALTER TABLE <table_name> MODIFY <attribute_name> <new_type>;
```

Renaming an attribute:

```
    ALTER TABLE <table_name> RENAME column <attribute_name> to <new_attribute_name>;
```

Renaming a table:

```
    ALTER TABLE <table_name> RENAME TO <new_table_name>;
```

Adding a constraint into a table (primary key constraint, foreign key constraint):

```
    ALTER TABLE <table_name> ADD CONSTRAINT <constraint_name> <constraint>;
```

Deleting a constraint from a table:

```
    ALTER TABLE <table_name> DROP CONSTRAINT <constraint_name>;
```

Checking all constraints:

```
    SELECT * FROM user_cons_columns WHERE TABLE_NAME =
    <table_name>;
```

Dropping a Table (both data and schema):

```
    DROP TABLE <table_name>;
```

3. Manipulating Data (DML)

Basic Query Structure

```
SELECT A1, A2, ..., An [list of attributes]
FROM r1, r2, ..., rm [list of relations]
WHERE P [condition]
```

Inserting records into a table:

```
    INSERT INTO <table_name> VALUES (…, …, …);
```

Deleting records from a table:

```
    DELETE FROM <table_name> WHERE <condition>;
```

Updating values of a record in a table:

```
    UPDATE <table_name>
    SET <attribute_name> = <value>
    WHERE <condition>;
```

Multi-table queries

Cartesian product:

```
    select *
    from instructor, department;
```

This generates many tuples which are not meaningful. To get the meaningful tuples, you need to write:

```
    select *
    from instructor, department;
    where instructor.dept_name = department.dept_name;
```

Natural join:

```
    select * from instructor natural join department;
```

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You must write all SQL statements in notepad first and save them with .sql extension. Then execute your SQL scripts.

Lab Task # 01 (Schema Definition):

Write SQL statements to create the following tables with the given constraints:

i) Account

account_no	char(5)	Primary key
balance	number	Not null and cannot be less than 0

ii) Customer

customer_no	char(5)	Primary key
customer_name	varchar2(20)	Not null
city	varchar2(20_	

iii) Depositor

account_no	char(5)	
customer_no	char(5)	
		Primary_key(account_no, customer_no)

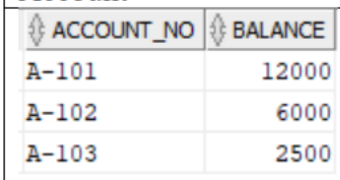
Lab Task # 02 (Schema Modification):

After executing each of these SQL statements execute the command – **`desc <table_name>`** to confirm the changes:

i. Write SQL statement to add a new attribute ‘date_of_birth’ (date type) in customer table.
ii. Write SQL statement to drop the attribute ‘date_of_birth’ from customer table.
iii. Write SQL statement to rename the attribute account_no, customer_no from depositor table to a_no and c_no, respectively.
iv. Write SQL statements to add two foreign key constraints ‘depositor_fk1’ and ‘depositor_fk2’ which identifies a_no and c_no as a foreign key.

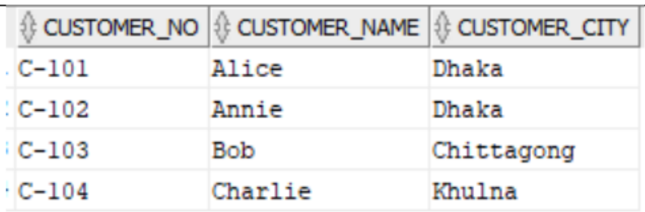
Lab Task # 03 (Inserting records into table):

Account



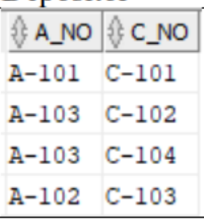
ACCOUNT_NO	BALANCE
A-101	12000
A-102	6000
A-103	2500

Customer



CUSTOMER_NO	CUSTOMER_NAME	CUSTOMER_CITY
C-101	Alice	Dhaka
C-102	Annie	Dhaka
C-103	Bob	Chittagong
C-104	Charlie	Khulna

Depositor



A_NO	C_NO
A-101	C-101
A-103	C-102
A-103	C-104
A-102	C-103

Lab Task # 04 (Writing Queries):

i. Display customer name and customer city only.
ii. Display the unique customer city. No repetitions are allowed.
iii. Find account numbers with balance more than 7000.
iv. Find customer number and customer name who live in Khulna.
v. Find customer number and customer name who do not live in Dhaka.
vi. Find customer name and customer city who have accounts with balance more than 7000.
vii. Find customer name and customer city who have accounts with balance more than 7000 and do not live in Khulna.
viii. Find account number and balance for those accounts which belong to a customer with id ‘C-102’.
ix. Find all account number and balance for those accounts which belong to customers of Dhaka and Khulna city.
x. Find the customer who have no accounts. [Result of this query will be empty for this dataset. However, you must write the correct SQL]

In class evaluation