
# Department of Computer Science
# MY University, Islamabad.

## Implementation Phase (LAB)

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|---|---|
| **Project No:** | **04** |
| **Course Title:** | **Database Systems** |
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| **Batch:** | **Fall2023** |
| **Program:** | **AI** |
| **Semester:** | **6th** |
| **Lab Instructor:** | **Mr. Hamza Javed** |
| **Submission Date:** | **28/04/24** |

MY UNIVERSITY
STEP INTO TOMORROW

**DepartmentofComputerScience**

**Spring-2024 DataBase Systems (CS-103)**

# Lab Task # 04

## Data Definition Language (DDL) and Constraints

*Instructors: Mr. Hamza Javed* *Date: 19 April 2023*

**Important Instruction**

1. No plagiarism allowed.
2. You will required to submit only soft copy via google classroom
3. Late submission not accepted
4. Rename submission file DB24-Name-RegNo. **like: DB24-hamza-1234**
5. You will required to submit single **pdf**

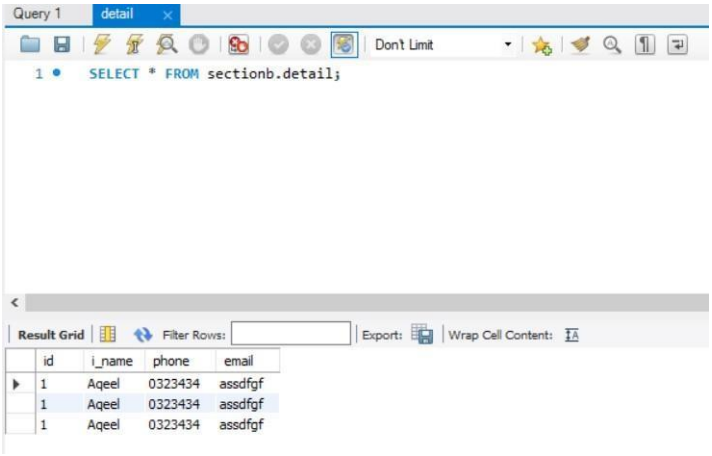
**Submission Example**

**Question .**

**Write query to select all data from table:**

**Solution**

**SELECT * FROM db.detail;**




**Question 1**

**Tasks:1**

1. **Create Department table based on the following design:**

| Column Name | Data Type | Allow Nulls |
|---|---|---|
| deptno | Int | ☐ |
| dname | varchar(14) | ☑ |
| loc | varchar(13) | ☑ |
| | | ☐ |

**Solution**

Query 1 | department_table - Table | department

Limit to 1000 rows

```
1  CREATE SCHEMA IF NOT EXISTS company;
2
3  CREATE TABLE company.department (
4      dept_no INT,
5      dept_name VARCHAR(14) NULL,
6      dept_loc VARCHAR(13) NULL
7  );
8
9
```

**Table: department**

**Columns:**

| | |
|---|---|
| dept_no | int |
| dept_name | varchar(14) |
| dept_loc | varchar(13) |

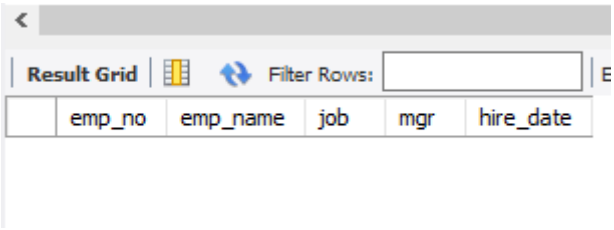


2. **Create Employee table based on the following design:**

| Column Name | Data Type | Allow Nulls |
|---|---|---|
| empno | Int | ☐ |
| ename | varchar(10) | ☐ |
| job | varchar(9) | ☑ |
| mgr | Int | ☑ |
| hiredate | date | ☑ |

**Solution**

```
CREATE TABLE company.employee (
    emp_no INT,
    emp_name VARCHAR(10) ,
    job VARCHAR(9) NULL,
    mgr INT NULL ,
    hire_date DATE NULL
);
```

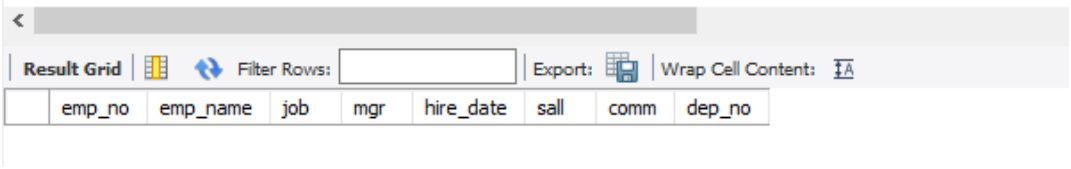



3. **Modify Employee table and add three more columns:**

| Column Name | Data Type | Allow Nulls |
|---|---|---|
| empno | Int | ☐ |
| ename | varchar(10) | ☐ |
| job | varchar(9) | ☑ |
| mgr | Int | ☑ |
| hiredate | date | ☑ |
| sal | Int | ☑ |
| comm | Int | ☑ |
| deptno | Int | ☑ |
| | | ☐ |

**Solution**

```
ALTER TABLE company.employee
ADD COLUMN sall INT NULL,
ADD COLUMN comm INT NULL,
ADD COLUMN dep_no INT NULL;
```



4. **Insert at least five Record into Employee table**

**Solution**

```
INSERT INTO company.employee (emp_no, emp_name, job, mgr, hire_date, sall, comm, dep_no)
VALUES
    (1, 'Fakhar', 'Manager', NULL, '2022-01-01', 50000, NULL, 101),
    (2, 'Saif', 'Analyst', 1, '2022-02-15', 40000, 2000, 102),
    (3, 'Mehwish', 'Developer', 1, '2022-03-10', 45000, 1000, 103),
    (4, 'Munawar', 'Designer', 2, '2022-04-05', 38000, NULL, 102),
    (5, 'Awan', 'Tester', 3, '2022-05-20', 42000, NULL, 103);
```

```
31
32 •  SELECT * FROM company.employee;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

| emp_no | emp_name | job | mgr | hire_date | sall | comm | dep_no |
|---|---|---|---|---|---|---|---|
| 1 | Fakhar | Manager | NULL | 2022-01-01 | 50000 | NULL | 101 |
| 2 | Saif | Analyst | 1 | 2022-02-15 | 40000 | 2000 | 102 |
| 3 | Mehwish | Developer | 1 | 2022-03-10 | 45000 | 1000 | 103 |
| 4 | Munawar | Designer | 2 | 2022-04-05 | 38000 | NULL | 102 |
| 5 | Awan | Tester | 3 | 2022-05-20 | 42000 | NULL | 103 |

5. **Drop Column loc from Department table**

**Solution**

```
34 •  ALTER TABLE company.department
35    DROP COLUMN loc;
36 •  SELECT * FROM company.department;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

| dept_no | dept_name | dept_loc |
|---|---|---|

6. **Delete all record from Employee table**

**Solution**

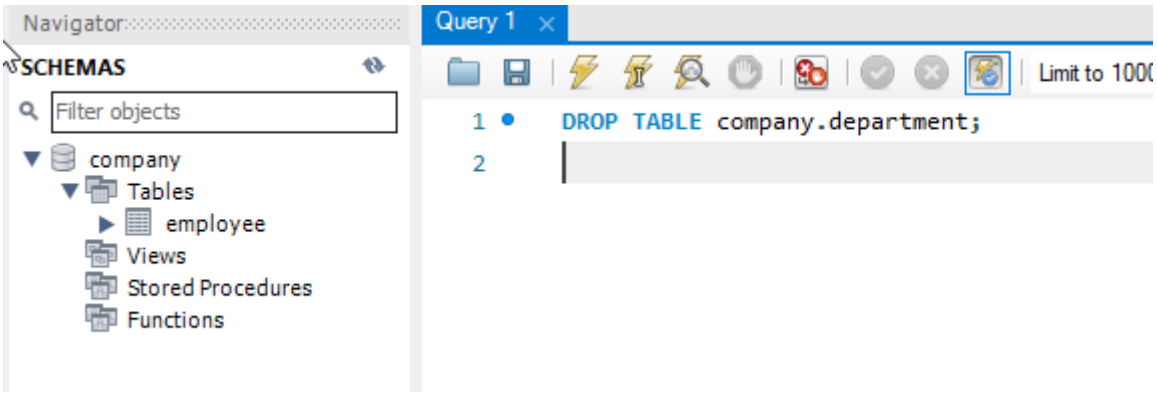
```
38 •  TRUNCATE TABLE company.employee;
39 •  SELECT * FROM company.employee;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

| emp_no | emp_name | job | mgr | hire_date | sall | comm | dep_no |
|---|---|---|---|---|---|---|---|

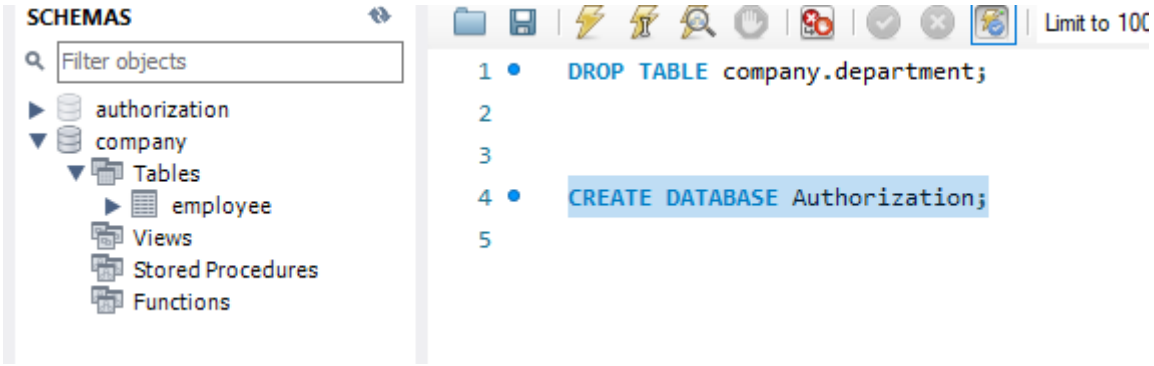
7. **Delete Department Table.**

**Solution**



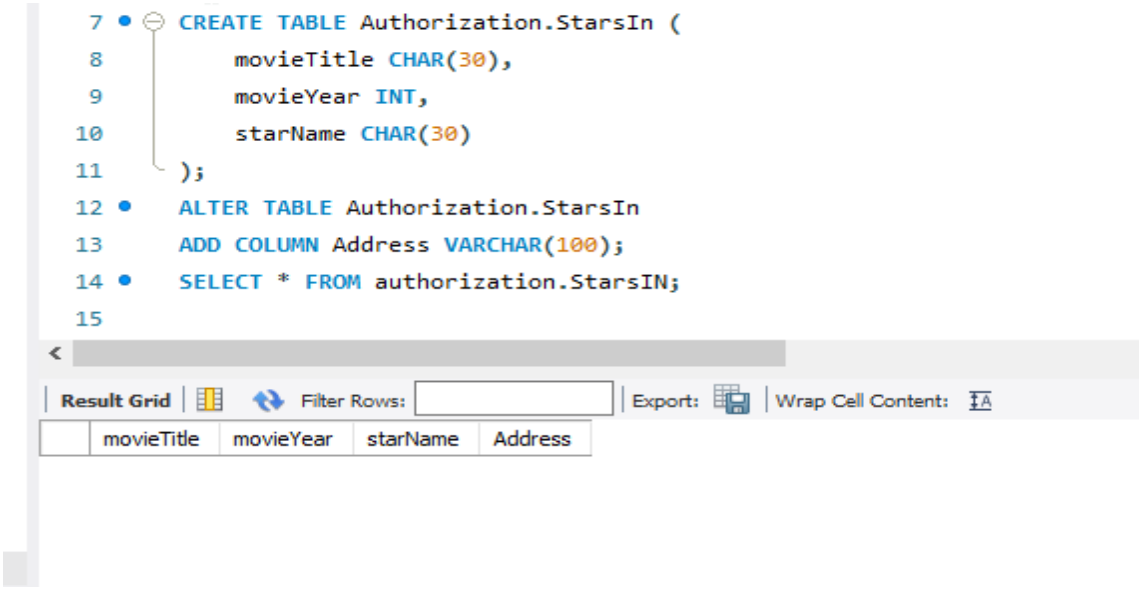

8. **Create database Authorization**

**Solution**




9. **Add a column 'Address' in Starsin table in database Authorization. CREATE TABLE StarsIn ( movieTitle char(30), movieYear int,starName char(30) );**

**Solution**



**Question 2**

**Tasks:2**

**Solve the Queries given below according to the following tables given below:**

**3**


1. **Apply Not Null Constraint on all columns.**
2. **Apply primary key constraint in OrderID and customer ID**
3. **Apply foreign key constraint on Customer ID in Order table.**
4. **Apply check constraint on city (allow Karachi, Islamabad, Lahore only).**
5. **Set the default value of City as 'Karachi'.**
6. **Add CNIC column in Customer table with unique constraint.**

**Solution**

```
CREATE SCHEMA IF NOT EXISTS ShoppingMall;
-- Create the Order table
CREATE TABLE ShoppingMall.Order (
    Order_ID INT NOT NULL,
    Customer_ID INT NOT NULL,
    Order_Detail VARCHAR(255) NOT NULL,
    Required_Date DATE NOT NULL
);

-- Create the Customer table
CREATE TABLE ShoppingMall.Customer (
    Customer_ID INT NOT NULL,
    First_name VARCHAR(50) NOT NULL,
    Last_name VARCHAR(50) NOT NULL,
    City VARCHAR(50) NOT NULL,
    Address VARCHAR(255) NOT NULL,

);
```

```sql
-- Add primary key constraint to Order_ID column
ALTER TABLE ShoppingMall.Order
ADD PRIMARY KEY (Order_ID);

-- Add primary key constraint to Customer_ID column
ALTER TABLE ShoppingMall.Customer
ADD PRIMARY KEY (Customer_ID);
```

```sql
ALTER TABLE ShoppingMall.Order
ADD FOREIGN KEY (Customer_ID)
REFERENCES ShoppingMall.Customer(Customer_ID);
```

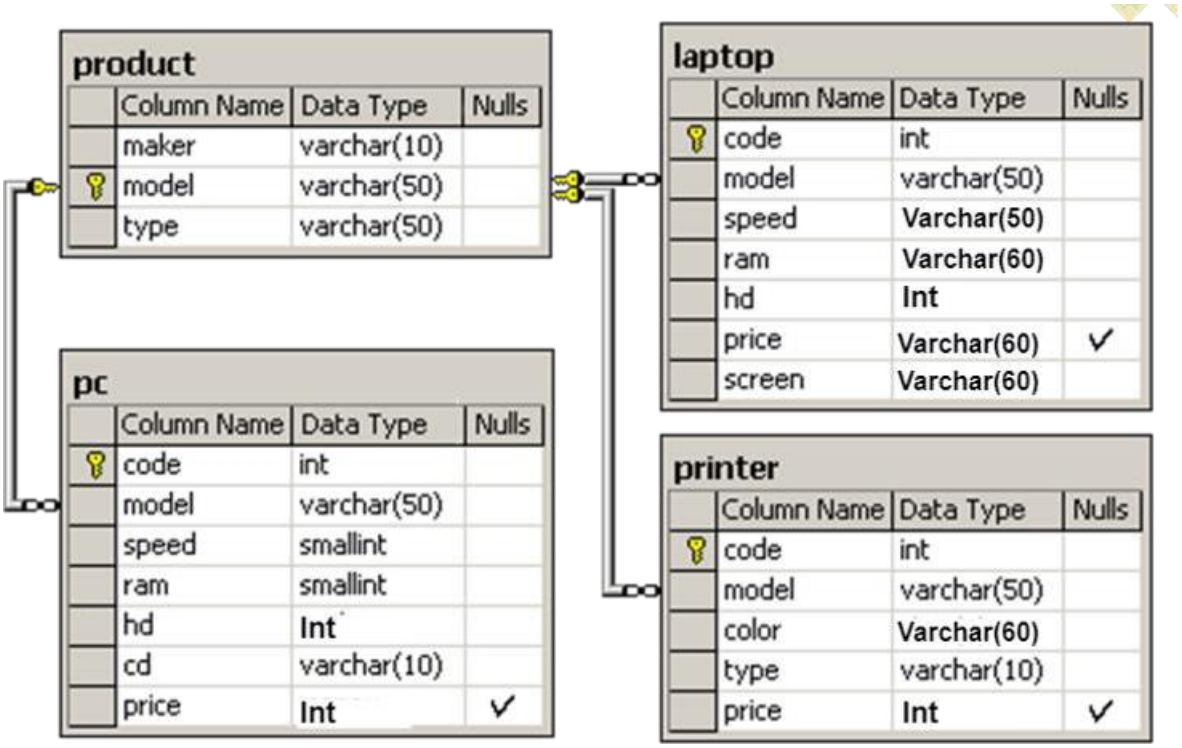
```sql
-- Add check constraint on City column in Customer table
ALTER TABLE ShoppingMall.Customer
ADD CONSTRAINT chk_city
CHECK (City IN ('Karachi', 'Islamabad', 'Lahore'));
```

```sql
-- Set default value for City column in Customer table
ALTER TABLE ShoppingMall.Customer
ALTER COLUMN City SET DEFAULT 'Karachi';
```

**Question 3**

**Task:3**

**Create the following tables given in diagram with constraints (PK-FK relationship).**




**Solution**

```
71      -- Create Table_Product
72  ●   CREATE TABLE ShoppingMall.Table_Product (
73          maker VARCHAR(10),
74          model VARCHAR(50) PRIMARY KEY,
75          type VARCHAR(50)
76      );
77
78      -- Create Table_Laptop with foreign key constraint
79  ●   CREATE TABLE ShoppingMall.Table_Laptop (
80          code INT PRIMARY KEY,
81          model VARCHAR(50),
82          speed VARCHAR(50),
83          ram VARCHAR(60),
84          hd INT,
85          price VARCHAR(60) DEFAULT NULL,
86          screen VARCHAR(60),
87          FOREIGN KEY (model) REFERENCES ShoppingMall.Table_Product(model)
88      );
89
```

```sql
-- Create Table_PC with foreign key constraint
CREATE TABLE ShoppingMall.Table_PC (
    code INT PRIMARY KEY,
    model VARCHAR(50),
    speed SMALLINT,
    ram SMALLINT,
    hd INT,
    cd VARCHAR(10),
    price INT DEFAULT NULL,
    FOREIGN KEY (model) REFERENCES ShoppingMall.Table_Product(model)
);
```

```sql
-- Create Table_Printer with foreign key constraint
CREATE TABLE ShoppingMall.Table_Printer (
    code INT PRIMARY KEY,
    model VARCHAR(50),
    color VARCHAR(50),
    type VARCHAR(10),
    price INT DEFAULT NULL,
    FOREIGN KEY (model) REFERENCES ShoppingMall.Table_Product(model)
);
```