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Mysql Day 1: 28-09-2023

Lab Exercise 1:

1. Write a SQL statement to create a simple table of countries including columns country_id,country_name and region_id.

Command:

create table tbl_countries(country_id int(5), country_name varchar(20), region_id int(6));

```
mysql> create table tbl_countries(country_id int(5), country_name varchar(20), region_id int(6));
Query OK, 0 rows affected, 2 warnings (0.02 sec)

mysql> show tables;
+----------------+
| Tables_in_day1 |
+----------------+
| tbl_countries  |
+----------------+
1 row in set (0.00 sec)

mysql> describe tbl_countries;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| country_id   | int         | YES  |     | NULL    |       |
| country_name | varchar(20) | YES  |     | NULL    |       |
| region_id    | int         | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

2. Write a SQL statement to create a simple table of countries including columns country_id,country_name and region_id which already exists.

```
mysql> create table tbl_countries(country_id int(5), country_name varchar(20), region_id int(6));
ERROR 1050 (42S01): Table 'tbl_countries' already exists
mysql>
```

3. Write a SQL statement to create the structure of a table dup_countries similar to countries.

```
mysql> create table dup_tbl_countries like tbl_countries;
Query OK, 0 rows affected (0.02 sec)

mysql> desc dup_tbl_countries;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| country_id   | int         | YES  |     | NULL    |       |
| country_name | varchar(20) | YES  |     | NULL    |       |
| region_id    | int         | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

4. Write a SQL statement to create a duplicate copy of countries table including structure and data by name dup_countries.

```
mysql> create table dup_tbl_countries as select * from tbl_countries;
ERROR 1050 (42S01): Table 'dup_tbl_countries' already exists
mysql>
```

5. Write a SQL statement to create a table countries set a constraint NULL.

```
mysql> alter table tbl_countries modify region_id int(5) NOT NULL;
Query OK, 0 rows affected, 1 warning (0.03 sec)
Records: 0  Duplicates: 0  Warnings: 1

mysql> alter table tbl_countries modify country_name varchar(20) NOT NULL;
Query OK, 0 rows affected (0.03 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> alter table tbl_countries modify country_id int(5) NOT NULL;
Query OK, 0 rows affected, 1 warning (0.05 sec)
Records: 0  Duplicates: 0  Warnings: 1

mysql> describe tbl_countries;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| country_id   | int         | NO   |     | NULL    |       |
| country_name | varchar(20) | NO   |     | NULL    |       |
| region_id    | int         | NO   |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

6. Write a SQL statement to create a table named jobs including columns job_id, job_title, min_salary, max_salary and check whether the max_salary amount exceeding the upper limit 25000.

```
mysql> create table jobs(job_id varchar(10), job_title varchar(20), min_salary decimal(6,0), max_salary decimal(6,0), check(max_salary<
=25000));
Query OK, 0 rows affected (0.03 sec)

mysql> desc jobs;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| job_id     | varchar(10) | YES  |     | NULL    |       |
| job_title  | varchar(20) | YES  |     | NULL    |       |
| min_salary | decimal(6,0)| YES  |     | NULL    |       |
| max_salary | decimal(6,0)| YES  |     | NULL    |       |
+------------+-------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

7. Write a SQL statement to create a table named countries including columns country_id, country_name and region_id and make sure that no countries except Italy, India and China will be entered in the table.

CREATE TABLE countries (COUNTRY_ID varchar(2), COUNTRY_NAME varchar(40) CHECK(COUNTRY_NAME IN('Italy','India','China')) ,REGION_ID decimal(10,0));

```
mysql> CREATE TABLE countries ( COUNTRY_ID varchar(2), COUNTRY_NAME varchar(40) CHECK(COUNTRY_NAME IN('Italy','India','China')) ,REGION_ID decimal(10,0));
Query OK, 0 rows affected (0.02 sec)

mysql> desc countries;
+--------------+---------------+------+-----+---------+-------+
| Field        | Type          | Null | Key | Default | Extra |
+--------------+---------------+------+-----+---------+-------+
| COUNTRY_ID   | varchar(2)    | YES  |     | NULL    |       |
| COUNTRY_NAME | varchar(40)   | YES  |     | NULL    |       |
| REGION_ID    | decimal(10,0) | YES  |     | NULL    |       |
+--------------+---------------+------+-----+---------+-------+
```

8. Write a SQL statement to create a table named job_histry including columns employee_id, start_date, end_date, job_id and department_id and make sure that the value against column end_date will be entered at the time of insertion to the format like '--/--/----'.

CREATE TABLE job_history (EMPLOYEE_ID decimal(6,0) NOT NULL, START_DATE date NOT NULL, END_DATE date NOT NULL CHECK (END_DATE LIKE '--/--/----'), JOB_ID varchar(10) NOT NULL, DEPARTMENT_ID decimal(4,0) NOT NULL);

```
mysql> CREATE TABLE job_history ( EMPLOYEE_ID decimal(6,0) NOT NULL, START_DATE date NOT NULL, END_DATE date NOT NULL CHECK (END_DATE LIKE '--/--/----'), JOB_ID varchar(10)
OT NULL );
Query OK, 0 rows affected (0.01 sec)

mysql> desc job_history;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| EMPLOYEE_ID   | decimal(6,0) | NO   |     | NULL    |       |
| START_DATE    | date        | NO   |     | NULL    |       |
| END_DATE      | date        | NO   |     | NULL    |       |
| JOB_ID        | varchar(10) | NO   |     | NULL    |       |
| DEPARTMENT_ID | decimal(4,0) | NO   |     | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
5 rows in set (0.00 sec)
```

9. Write a SQL statement to create a table named countries including columns country_id,country_name and region_id and make sure that no duplicate data against column country_id will be allowed at the time of insertion.

create table countries1 (country_id varchar(2) not null, country_name varchar(40) not null, region_id decimal(10,0) not null, unique(country_id));

```
mysql> create table countries1 (country_id varchar(2) not null, country_name varchar(40) not null, region_id decimal(10,0) not null, unique(country_id));
Query OK, 0 rows affected (0.02 sec)

mysql> desc countries1;
+--------------+---------------+------+-----+---------+-------+
| Field        | Type          | Null | Key | Default | Extra |
+--------------+---------------+------+-----+---------+-------+
| country_id   | varchar(2)    | NO   | PRI | NULL    |       |
| country_name | varchar(40)   | NO   |     | NULL    |       |
| region_id    | decimal(10,0) | NO   |     | NULL    |       |
+--------------+---------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

10. Write a SQL statement to create a table named jobs including columns job_id, job_title, min_salary and max_salary, and make sure that, the default value for job_title is blank and min_salary is 8000 and max_salary is NULL will be entered automatically at the time of insertion if no value assigned for the specified columns.

CREATE TABLE IF NOT EXISTS jobs (JOB_ID varchar(10) NOT NULL UNIQUE, JOB_TITLE varchar(35) NOT NULL DEFAULT ' ', MIN_SALARY decimal(6,0) DEFAULT 8000, MAX_SALARY decimal(6,0) DEFAULT NULL);

```
mysql> CREATE TABLE IF NOT EXISTS jobs ( JOB_ID varchar(10) NOT NULL UNIQUE, JOB_TITLE varchar(35)
 NOT NULL DEFAULT ' ', MIN_SALARY decimal(6,0) DEFAULT 8000, MAX_SALARY decimal(6,0) DEFAULT NULL)
;
Query OK, 0 rows affected, 1 warning (0.00 sec)

mysql> desc jobs;
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| job_id     | varchar(10)  | YES  |     | NULL    |       |
| job_title  | varchar(20)  | YES  |     | NULL    |       |
| min_salary | decimal(6,0) | YES  |     | NULL    |       |
| max_salary | decimal(6,0) | YES  |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

11. Write a SQL statement to create a table named countries including columns country_id, country_name and region_id and make sure that the country_id column will be a key field which will not contain any duplicate data at the time of insertion.

create table countries1 (country_id varchar(2) not null, country_name varchar(40) not null, region_id decimal(10,0) not null, unique(country_id));

```
mysql> create table countries1 (country_id varchar(2) not null, country_name varchar(40) not null, region_id decimal(10,0) not null, unique(country_id));
Query OK, 0 rows affected (0.02 sec)

mysql> desc countries1;
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| country_id  | varchar(2)   | NO   | PRI | NULL    |       |
| country_name| varchar(40)  | NO   |     | NULL    |       |
| region_id   | decimal(10,0)| NO   |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

12. Write a SQL statement to create a table countries including columns country_id, country_name and region_id and make sure that the column country_id will be unique and store an auto incremented value.

CREATE TABLE countries (COUNTRY_ID integer NOT NULL UNIQUE AUTO_INCREMENT PRIMARY KEY,COUNTRY_NAME varchar(40) NOT NULL,REGION_ID decimal(10,0) NOT NULL);

```
mysql> CREATE TABLE IF NOT EXISTS countries ( COUNTRY_ID integer NOT NULL UNIQUE AUTO_INCREMENT PRIMARY KEY,COUNTRY_NAME va
rchar(40) NOT NULL,REGION_ID decimal(10,0) NOT NULL);
Query OK, 0 rows affected, 1 warning (0.00 sec)

mysql> desc countries;
+--------------+---------------+------+-----+---------+-------+
| Field        | Type          | Null | Key | Default | Extra |
+--------------+---------------+------+-----+---------+-------+
| COUNTRY_ID   | varchar(2)    | YES  |     | NULL    |       |
| COUNTRY_NAME | varchar(40)   | YES  |     | NULL    |       |
| REGION_ID    | decimal(10,0) | YES  |     | NULL    |       |
+--------------+---------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

13. Write a SQL statement to create a table countries including columns country_id, country_name and region_id and make sure that the combination of columns country_id and region_id will be unique.

create table countries2 (country_id varchar(2) not null, country_name varchar(40) not null, region_id decimal(10,0) not null, unique(country_id, region_id));

```
mysql> create table countries2 (country_id varchar(2) not null, country_name varchar(40) not null, region_id decimal(10,0)
not null, unique(country_id, region_id));
Query OK, 0 rows affected (0.02 sec)

mysql> desc countries2;
+--------------+---------------+------+-----+---------+-------+
| Field        | Type          | Null | Key | Default | Extra |
+--------------+---------------+------+-----+---------+-------+
| country_id   | varchar(2)    | NO   | PRI | NULL    |       |
| country_name | varchar(40)   | NO   |     | NULL    |       |
| region_id    | decimal(10,0) | NO   | PRI | NULL    |       |
+--------------+---------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

14. Write a SQL statement to create a table job_history including columns employee_id, start_date, end_date, job_id and department_id and make sure that, the employee_id column does not contain any duplicate value at the time of insertion and the foreign key column job_id contain only those values which are exists in the jobs table.

CREATE TABLE jobs1 (JOB_ID varchar(10) NOT NULL UNIQUE, JOB_TITLE varchar(35) NOT NULL DEFAULT ' ', MIN_SALARY decimal(6,0) DEFAULT 8000, MAX_SALARY decimal(6,0) DEFAULT NULL);

create table job_history1 (em ployee_id decimal(6,0) not null primary key, start_date date not null, end_date date not null, job_id varchar(10) not null, department_id decimal(4,0) default null, foreign key (job_id) references jobs1(job_id));

Here is the structure of the table jobs;

+------------+--------------+------+-----+---------+-------+
| Field | Type | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| JOB_ID | varchar(10) | NO | PRI | | |
| JOB_TITLE | varchar(35) | NO | | NULL | |
| MIN_SALARY | decimal(6,0) | YES | | NULL | |
| MAX_SALARY | decimal(6,0) | YES | | NULL | |
+------------+--------------+------+-----+---------+-------+

```
mysql> CREATE TABLE jobs1 ( JOB_ID varchar(10) NOT NULL UNIQUE, JOB_TITLE varchar(35) NOT NULL DEFAULT ' ', MIN_SALARY decimal(6,0) DEFAULT 8000, MAX_SALARY decimal(6,0) DE
FAULT NULL);
Query OK, 0 rows affected (0.03 sec)

mysql> create table job_history1 (employee_id decimal(6,0) not null primary key, start_date date not null, end_date date not null, job_id varchar(10) not null, department_i
d decimal(4,0) default null, foreign key (job_id) references jobs1(job_id));
Query OK, 0 rows affected (0.05 sec)

mysql> desc job_history1;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| employee_id   | decimal(6,0) | NO   | PRI | NULL    |       |
| start_date    | date        | NO   |     | NULL    |       |
| end_date      | date        | NO   |     | NULL    |       |
| job_id        | varchar(10) | NO   | MUL | NULL    |       |
| department_id | decimal(4,0) | YES  |     | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
5 rows in set (0.00 sec)

mysql> desc jobs1;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| JOB_ID     | varchar(10) | NO   | PRI | NULL    |       |
| JOB_TITLE  | varchar(35) | NO   |     |         |       |
| MIN_SALARY | decimal(6,0) | YES  |     | 8000    |       |
| MAX_SALARY | decimal(6,0) | YES  |     | NULL    |       |
+------------+-------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

15. Write a SQL statement to create a table employees including columns employee_id, first_name, last_name, email, phone_number hire_date, job_id, salary, commission, manager_id and department_id and make sure that, the employee_id column does not contain any duplicate value at the time of insertion and the foreign key columns combined by department_id and manager_id columns contain only those unique combination values, which combinations are exists in the departments table.

Assume the structure of departments table below.

+----------------+-------------+------+-----+---------+-------+
| Field | Type | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| DEPARTMENT_ID | decimal(4,0) | NO | PRI | 0 | |
| DEPARTMENT_NAME | varchar(30) | NO | | NULL | |
| MANAGER_ID | decimal(6,0) | NO | PRI | 0 | |
| LOCATION_ID | decimal(4,0) | YES | | NULL | |
+----------------+-------------+------+-----+---------+-------+

```
mysql> desc tbl_departments;
+-----------------+---------------+------+-----+---------+-------+
| Field           | Type          | Null | Key | Default | Extra |
+-----------------+---------------+------+-----+---------+-------+
| department_Id   | decimal(4,0)  | NO   | PRI | 0       |       |
| department_name | decimal(10,0) | NO   |     | NULL    |       |
| manager_id      | decimal(6,0)  | NO   | PRI | 0       |       |
| location_id     | decimal(4,0)  | YES  |     | NULL    |       |
+-----------------+---------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

```
mysql>  CREATE TABLE IF NOT EXISTS employees (
    ->  EMPLOYEE_ID decimal(6,0) NOT NULL PRIMARY KEY,
    -> FIRST_NAME varchar(20) DEFAULT NULL,
    -> LAST_NAME varchar(25) NOT NULL,
    -> EMAIL varchar(25) NOT NULL,
    -> PHONE_NUMBER varchar(20) DEFAULT NULL,
    -> HIRE_DATE date NOT NULL,
    -> JOB_ID varchar(10) NOT NULL,
    -> SALARY decimal(8,2) DEFAULT NULL,
    -> COMMISSION_PCT decimal(2,2) DEFAULT NULL,
    -> MANAGER_ID decimal(6,0) DEFAULT NULL,
    -> DEPARTMENT_ID decimal(4,0) DEFAULT NULL,
    -> FOREIGN KEY(DEPARTMENT_ID,MANAGER_ID)
    -> REFERENCES tbl_departments(DEPARTMENT_ID,MANAGER_ID)
    ->  )ENGINE=InnoDB;
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> select * from employees;
Empty set (0.00 sec)
```

16. Write a SQL statement to create a table employees including columns employee_id, first_name, last_name, email, phone_number hire_date, job_id, salary, commission, manager_id and department_id and make sure that, the employee_id column does not contain any duplicate value at the time of insertion, and the foreign key column department_id, reference by the column department_id of departments table, can contain only those values which are exists in the departments table and another foreign key column job_id, referenced by the column job_id of jobs table, can contain only those values which are exists in the jobs table. The InnoDB Engine have been used to create the tables.

"A foreign key constraint is not required merely to join two tables. For storage engines other than InnoDB, it is possible when defining a column to use a REFERENCES tbl_name(col_name) clause, which has no actual effect, and serves only as a memo or comment to you that the column which you are currently defining is intended to refer to a column in another table." - Reference dev.mysql.com

Assume that the structure of two tables departments and jobs.

```
+-----------------+--------------+------+-----+---------+-------+
| Field           | Type         | Null | Key | Default | Extra |
+-----------------+--------------+------+-----+---------+-------+
| DEPARTMENT_ID   | decimal(4,0) | NO   | PRI | 0       |       |
| DEPARTMENT_NAME | varchar(30)  | NO   |     | NULL    |       |
| MANAGER_ID      | decimal(6,0) | YES  |     | NULL    |       |

| LOCATION_ID     | decimal(4,0) | YES  |     | NULL    |       |
+-----------------+--------------+------+-----+---------+-------+
```

```
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| JOB_ID     | varchar(10)  | NO   | PRI |         |       |
| JOB_TITLE  | varchar(35)  | NO   |     | NULL    |       |
| MIN_SALARY | decimal(6,0) | YES  |     | NULL    |       |
| MAX_SALARY | decimal(6,0) | YES  |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
```

```
mysql> create table departments (
    -> department_id decimal(4,0) NOT NULL PRIMARY KEY default '0',
    -> department_name varchar(30) NOT NULL,
    -> manager_id decimal(6,0) default NULL,
    -> location_id decimal(4,0) default NULL
    -> );
Query OK, 0 rows affected (0.03 sec)

mysql> show tables;
+---------------+
| Tables_in_sal |
+---------------+
| departments   |
+---------------+
1 row in set (0.00 sec)
```

```
mysql> create table jobs (
    -> job_id varchar(10) NOT NULL PRIMARY KEY,
    -> job_title varchar(35) NOT NULL,
    ->  min_salary decimal(6,0) default NULL,
    ->  max_salary decimal(6,0) default NULL
    -> );
Query OK, 0 rows affected (0.03 sec)

mysql> show tables;
+---------------+
| Tables_in_sal |
+---------------+
| departments   |
| jobs          |
+---------------+
2 rows in set (0.00 sec)

mysql> desc jobs;
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| job_id     | varchar(10)  | NO   | PRI | NULL    |       |
| job_title  | varchar(35)  | NO   |     | NULL    |       |
| min_salary | decimal(6,0) | YES  |     | NULL    |       |
| max_salary | decimal(6,0) | YES  |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

```
mysql> CREATE TABLE IF NOT EXISTS employees (
    -> EMPLOYEE_ID decimal(6,0) NOT NULL PRIMARY KEY,
    -> FIRST_NAME varchar(20) DEFAULT NULL,
    -> LAST_NAME varchar(25) NOT NULL,
    -> EMAIL varchar(25) NOT NULL,
    -> PHONE_NUMBER varchar(20) DEFAULT NULL,
    -> HIRE_DATE date NOT NULL,
    -> JOB_ID varchar(10) NOT NULL,
    -> SALARY decimal(8,2) DEFAULT NULL,
    -> COMMISSION_PCT decimal(2,2) DEFAULT NULL,
    -> MANAGER_ID decimal(6,0) DEFAULT NULL,
    -> DEPARTMENT_ID decimal(4,0) DEFAULT NULL,
    -> FOREIGN KEY(DEPARTMENT_ID)
    -> REFERENCES  departments(DEPARTMENT_ID),
    -> FOREIGN KEY(JOB_ID)
    -> REFERENCES  jobs(JOB_ID)
    -> )ENGINE=InnoDB;
Query OK, 0 rows affected (0.03 sec)

mysql> show tables;
+---------------+
| Tables_in_sal |
+---------------+
| departments   |
| employees     |
| jobs          |
+---------------+
3 rows in set (0.00 sec)
```

```
mysql> desc employees;
+----------------+--------------+------+-----+---------+-------+
| Field          | Type         | Null | Key | Default | Extra |
+----------------+--------------+------+-----+---------+-------+
| EMPLOYEE_ID    | decimal(6,0) | NO   | PRI | NULL    |       |
| FIRST_NAME     | varchar(20)  | YES  |     | NULL    |       |
| LAST_NAME      | varchar(25)  | NO   |     | NULL    |       |
| EMAIL          | varchar(25)  | NO   |     | NULL    |       |
| PHONE_NUMBER   | varchar(20)  | YES  |     | NULL    |       |
| HIRE_DATE      | date         | NO   |     | NULL    |       |
| JOB_ID         | varchar(10)  | NO   | MUL | NULL    |       |
| SALARY         | decimal(8,2) | YES  |     | NULL    |       |
| COMMISSION_PCT | decimal(2,2) | YES  |     | NULL    |       |
| MANAGER_ID     | decimal(6,0) | YES  |     | NULL    |       |
| DEPARTMENT_ID  | decimal(4,0) | YES  | MUL | NULL    |       |
+----------------+--------------+------+-----+---------+-------+
11 rows in set (0.00 sec)
```

17. Write a SQL statement to create a table employees including columns employee_id, first_name, last_name, job_id, salary and make sure that, the employee_id column does not contain any duplicate value at the time of insertion, and the foreign key column job_id, referenced by the column job_id of jobs table, can contain only those values which are exists in the jobs table. The InnoDB Engine have been used to create the tables. The specialty of the statement is that, The ON UPDATE CASCADE action allows you to perform cross-table update and ON DELETE RESTRICT action reject the deletion. The default action is ON DELETE RESTRICT.

Assume that the structure of the table jobs and InnoDB Engine have been used to create the table jobs.

CREATE TABLE IF NOT EXISTS jobs (
JOB_ID integer NOT NULL UNIQUE PRIMARY KEY,
JOB_TITLE varchar(35) NOT NULL DEFAULT ' ',
MIN_SALARY decimal(6,0) DEFAULT 8000,
MAX_SALARY decimal(6,0) DEFAULT NULL
)ENGINE=InnoDB;

+------------+--------------+------+-----+---------+-------+
| Field | Type | Null | Key | Default | Extra |

+------------+--------------+------+-----+---------+-------+

| JOB_ID | int(11) | NO | PRI | NULL | |

| JOB_TITLE | varchar(35) | NO | | | |

| MIN_SALARY | decimal(6,0) | YES | | 8000 | |

| MAX_SALARY | decimal(6,0) | YES | | NULL | |

+------------+--------------+------+-----+---------+-------+

```
mysql> create table tbl_jobs (
    -> job_id integer NOT NULL UNIQUE PRIMARY KEY,
    -> job_title varchar(35) NOT NULL default ' ' ,
    -> min_salary decimal(6,0) default 8000,
    -> max_salary decimal(6,0) default NULL
    -> )ENGINE=InnoDB;
Query OK, 0 rows affected (0.02 sec)

mysql> show tables;
+---------------+
| Tables_in_sal |
+---------------+
| departments   |
| employees     |
| jobs          |
| tbl_jobs      |
+---------------+
4 rows in set (0.00 sec)

mysql> desc tbl_jobs;
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| job_id     | int          | NO   | PRI | NULL    |       |
| job_title  | varchar(35)  | NO   |     |         |       |
| min_salary | decimal(6,0) | YES  |     | 8000    |       |
| max_salary | decimal(6,0) | YES  |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

```
mysql> CREATE TABLE IF NOT EXISTS tbl_employees (
    -> EMPLOYEE_ID decimal(6,0) NOT NULL PRIMARY KEY,
    -> FIRST_NAME varchar(20) DEFAULT NULL,
    -> LAST_NAME varchar(25) NOT NULL,
    ->  EMAIL varchar(25) NOT NULL,
    -> PHONE_NUMBER varchar(20) DEFAULT NULL,
    -> HIRE_DATE date NOT NULL,
    -> JOB_ID varchar(10) NOT NULL,
    -> SALARY decimal(8,2) DEFAULT NULL,
    -> COMMISSION_PCT decimal(2,2) DEFAULT NULL,
    -> MANAGER_ID decimal(6,0) DEFAULT NULL,
    -> DEPARTMENT_ID decimal(4,0) DEFAULT NULL,
    -> FOREIGN KEY(DEPARTMENT_ID)
    ->  REFERENCES  departments(DEPARTMENT_ID),
    -> FOREIGN KEY(JOB_ID)
    ->  REFERENCES  jobs(JOB_ID)
    -> )ENGINE=InnoDB;
Query OK, 0 rows affected (0.03 sec)

mysql> show tables;
+---------------+
| Tables_in_sal |
+---------------+
| departments   |
| employees     |
| jobs          |
| tbl_employees |
| tbl_jobs      |
+---------------+
5 rows in set (0.00 sec)
```

```
mysql> desc tbl_employees;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| EMPLOYEE_ID   | decimal(6,0) | NO   | PRI | NULL    |       |
| FIRST_NAME    | varchar(20)  | YES  |     | NULL    |       |
| LAST_NAME     | varchar(25)  | NO   |     | NULL    |       |
| EMAIL         | varchar(25)  | NO   |     | NULL    |       |
| PHONE_NUMBER  | varchar(20)  | YES  |     | NULL    |       |
| HIRE_DATE     | date         | NO   |     | NULL    |       |
| JOB_ID        | varchar(10)  | NO   | MUL | NULL    |       |
| SALARY        | decimal(8,2) | YES  |     | NULL    |       |
| COMMISSION_PCT | decimal(2,2) | YES  |     | NULL    |       |
| MANAGER_ID    | decimal(6,0) | YES  |     | NULL    |       |
| DEPARTMENT_ID | decimal(4,0) | YES  | MUL | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
11 rows in set (0.00 sec)
```

18. Write a SQL statement to create a table employees including columns employee_id, first_name, last_name, job_id, salary and make sure that, the employee_id column does not contain any duplicate value at the time of insertion, and the foreign key column job_id, referenced by the column job_id of jobs table, can contain only those values which are exists in the jobs table. The InnoDB Engine have been used to create the tables. The specialty of the statement is that, The ON DELETE CASCADE that lets you allow to delete records in the employees(child) table that refer to a record in the jobs(parent) table when the record in the parent table is deleted and the ON UPDATE RESTRICT actions reject any updates.

Assume that the structure of the table jobs and InnoDB Engine have been used to create the table jobs.

```
CREATE TABLE IF NOT EXISTS jobs (
JOB_ID integer NOT NULL UNIQUE PRIMARY KEY,
JOB_TITLE varchar(35) NOT NULL DEFAULT ' ',
MIN_SALARY decimal(6,0) DEFAULT 8000,
MAX_SALARY decimal(6,0) DEFAULT NULL
)ENGINE=InnoDB;
```

```
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| JOB_ID     | int(11)      | NO   | PRI | NULL    |       |
| JOB_TITLE  | varchar(35)  | NO   |     |         |       |
| MIN_SALARY | decimal(6,0) | YES  |     | 8000    |       |
| MAX_SALARY | decimal(6,0) | YES  |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
```

```
mysql> create table tbl_jobas (
    ->  job_id int(11) NOT NULL UNIQUE PRIMARY KEY,
    ->  job_title varchar(35) NOT NULL default ' ' ,
    -> min_salary decimal(6,0) default '8000' ,
    -> max_salary decimal(6,0) default NULL
    ->  )ENGINE=InnoDB;
Query OK, 0 rows affected, 1 warning (0.05 sec)

mysql> show tables;
+---------------+
| Tables_in_sal |
+---------------+
| departments   |
| employees     |
| jobs          |
| tbl_employees |
| tbl_jobas     |
| tbl_jobs      |
+---------------+
6 rows in set (0.00 sec)

mysql> desc tbl_jobas;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| job_id     | int         | NO   | PRI | NULL    |       |
| job_title  | varchar(35) | NO   |     |         |       |
| min_salary | decimal(6,0) | YES  |     | 8000    |       |
| max_salary | decimal(6,0) | YES  |     | NULL    |       |
+------------+-------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

```
mysql> CREATE TABLE IF NOT EXISTS tbl_employeeesa (
    -> EMPLOYEE_ID decimal(6,0) NOT NULL PRIMARY KEY,
    -> FIRST_NAME varchar(20) DEFAULT NULL,
    -> LAST_NAME varchar(25) NOT NULL,
    -> JOB_ID INTEGER NOT NULL,
    ->  SALARY decimal(8,2) DEFAULT NULL,
    -> FOREIGN KEY(JOB_ID)
    -> REFERENCES  tbl_jobs(JOB_ID)
    ->  ON DELETE CASCADE ON UPDATE RESTRICT
    ->  )ENGINE=InnoDB;
Query OK, 0 rows affected (0.02 sec)

mysql> show tables;
+-----------------+
| Tables_in_sal   |
+-----------------+
| departments     |
| employees       |
| jobs            |
| tbl_employeees  |
| tbl_employeeesa |
| tbl_employees   |
| tbl_jobas       |
| tbl_jobs        |
+-----------------+
8 rows in set (0.00 sec)
```

19. Write a SQL statement to create a table employees including columns employee_id, first_name, last_name, job_id, salary and make sure that, the employee_id column does not contain any duplicate value at the time of insertion, and the foreign key column job_id, referenced by the column job_id of jobs table, can contain only those values which are exists in the jobs table. The InnoDB Engine have been used to create the tables. The specialty of the statement is that, The ON DELETE SET NULL action will set the foreign key column values in the child table(employees) to NULL when the record in the parent table(jobs) is deleted, with a condition that the foreign key column in the child table must accept NULL values and the ON UPDATE SET NULL action resets the values in the rows in the child table(employees) to NULL values when the rows in the parent table(jobs) are updated.

Assume that the structure of two table jobs and InnoDB Engine have been used to create the table jobs.

```
CREATE TABLE IF NOT EXISTS jobs (
JOB_ID integer NOT NULL UNIQUE PRIMARY KEY,
JOB_TITLE varchar(35) NOT NULL DEFAULT ' ',
MIN_SALARY decimal(6,0) DEFAULT 8000,
MAX_SALARY decimal(6,0) DEFAULT NULL
)ENGINE=InnoDB;
```

```
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| JOB_ID     | int(11)      | NO   | PRI | NULL    |       |
| JOB_TITLE  | varchar(35)  | NO   |     |         |       |
| MIN_SALARY | decimal(6,0) | YES  |     | 8000    |       |
| MAX_SALARY | decimal(6,0) | YES  |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
```

```
mysql> create table tbl_jobase (
    -> job_id integer NOT NULL UNIQUE PRIMARY KEY,
    -> job_title varchar(35) NOT NULL default ' ' ,
    -> min_salary decimal(6,0) default '8000',
    -> max_salary decimal(6,0) default NULL
    -> )ENGINE=InnoDB;
Query OK, 0 rows affected (0.03 sec)

mysql> show tables;
+-----------------+
| Tables_in_sal   |
+-----------------+
| departments     |
| employees       |
| jobs            |
| tbl_employeees  |
| tbl_employeeesa |
| tbl_employees   |
| tbl_jobas       |
| tbl_jobase      |
| tbl_jobs        |
+-----------------+
9 rows in set (0.00 sec)

mysql> desc tbl_jobase;
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| job_id     | int          | NO   | PRI | NULL    |       |
| job_title  | varchar(35)  | NO   |     |         |       |
| min_salary | decimal(6,0) | YES  |     | 8000    |       |
| max_salary | decimal(6,0) | YES  |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

```
mysql> CREATE TABLE IF NOT EXISTS employees (
    -> EMPLOYEE_ID decimal(6,0) NOT NULL PRIMARY KEY,
    -> FIRST_NAME varchar(20) DEFAULT NULL,
    -> LAST_NAME varchar(25) NOT NULL,
    -> JOB_ID INTEGER,
    -> SALARY decimal(8,2) DEFAULT NULL,
    -> FOREIGN KEY(JOB_ID)
    -> REFERENCES  jobs(JOB_ID)
    -> ON DELETE SET NULL
    -> ON UPDATE SET NULL
    -> )ENGINE=InnoDB;
Query OK, 0 rows affected, 1 warning (0.01 sec)

mysql> show tables;
+-----------------+
| Tables_in_sal   |
+-----------------+
| departments     |
| employees       |
| jobs            |
| tbl_employeees  |
| tbl_employeeesa |
| tbl_employees   |
| tbl_jobas       |
| tbl_jobase      |
| tbl_jobs        |
+-----------------+
9 rows in set (0.00 sec)
```

```
mysql> desc employees;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| EMPLOYEE_ID   | decimal(6,0) | NO   | PRI | NULL    |       |
| FIRST_NAME    | varchar(20)  | YES  |     | NULL    |       |
| LAST_NAME     | varchar(25)  | NO   |     | NULL    |       |
| EMAIL         | varchar(25)  | NO   |     | NULL    |       |
| PHONE_NUMBER  | varchar(20)  | YES  |     | NULL    |       |
| HIRE_DATE     | date         | NO   |     | NULL    |       |
| JOB_ID        | varchar(10)  | NO   | MUL | NULL    |       |
| SALARY        | decimal(8,2) | YES  |     | NULL    |       |
| COMMISSION_PCT | decimal(2,2) | YES  |     | NULL    |       |
| MANAGER_ID    | decimal(6,0) | YES  |     | NULL    |       |
| DEPARTMENT_ID | decimal(4,0) | YES  | MUL | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
11 rows in set (0.00 sec)
```

20. Write a SQL statement to create a table employees including columns employee_id, first_name, last_name, job_id, salary and make sure that, the employee_id column does not contain any duplicate value at the time of insertion, and the foreign key column job_id, referenced by the column job_id of jobs table, can contain only those values which are exists in the jobs table. The InnoDB Engine have been used to create the tables. The specialty of the statement is that, The ON DELETE NO ACTION and the ON UPDATE NO ACTION actions will reject the deletion and any updates.

Assume that the structure of two table jobs and InnoDB Engine have been used to create the table jobs.

CREATE TABLE IF NOT EXISTS jobs (
JOB_ID integer NOT NULL UNIQUE PRIMARY KEY,
JOB_TITLE varchar(35) NOT NULL DEFAULT ' ',
MIN_SALARY decimal(6,0) DEFAULT 8000,
MAX_SALARY decimal(6,0) DEFAULT NULL

)ENGINE=InnoDB;

+------------+--------------+------+-----+---------+-------+
| Field | Type | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| JOB_ID | int(11) | NO | PRI | NULL | |
| JOB_TITLE | varchar(35) | NO | | | |
| MIN_SALARY | decimal(6,0) | YES | | 8000 | |
| MAX_SALARY | decimal(6,0) | YES | | NULL | |
+------------+--------------+------+-----+---------+-------+

```
mysql> create table tbl_jonds (
    -> job_id integer NOT NULL UNIQUE PRIMARY KEY,
    -> job_title varchar(35) NOT NULL default ' ' ,
    -> min_salary decimal(6,0) default '8000' ,
    -> max_salary decimal(6,0) default NULL
    -> )ENGINE=InnoDB;
Query OK, 0 rows affected (0.02 sec)

mysql> show tables;
+-----------------+
| Tables_in_sal   |
+-----------------+
| departments     |
| employees       |
| jobs            |
| tbl_employeees  |
| tbl_employeeesa |
| tbl_employees   |
| tbl_jobas       |
| tbl_jobase      |
| tbl_jobs        |
| tbl_jonds       |
+-----------------+
10 rows in set (0.00 sec)

mysql> desc tbl_jonds;
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| job_id     | int          | NO   | PRI | NULL    |       |
| job_title  | varchar(35)  | NO   |     |         |       |
| min_salary | decimal(6,0) | YES  |     | 8000    |       |
| max_salary | decimal(6,0) | YES  |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

```
mysql> CREATE TABLE IF NOT EXISTS employees (
    -> EMPLOYEE_ID decimal(6,0) NOT NULL PRIMARY KEY,
    -> FIRST_NAME varchar(20) DEFAULT NULL,
    -> LAST_NAME varchar(25) NOT NULL,
    -> JOB_ID INTEGER NOT NULL,
    -> SALARY decimal(8,2) DEFAULT NULL,
    -> FOREIGN KEY(JOB_ID)
    -> REFERENCES  jobs(JOB_ID)
    -> ON DELETE NO ACTION
    -> ON UPDATE NO ACTION
    -> )ENGINE=InnoDB;
Query OK, 0 rows affected, 1 warning (0.00 sec)

mysql> show tables;
+-----------------+
| Tables_in_sal   |
+-----------------+
| departments     |
| employees       |
| jobs            |
| tbl_employeees  |
| tbl_employeeesa |
| tbl_employees   |
| tbl_jobas       |
| tbl_jobase      |
| tbl_jobs        |
| tbl_jonds       |
+-----------------+
10 rows in set (0.00 sec)
```