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MYSQL

LAB ACTIVITY - 1

MySQL Create Table [20 exercises with solution]
1. Write a SQL statement to create a simple table countries including columns country_id,country_name and region_id.

```
mysql> use mysqlday1
Database changed
mysql> create table tbl_countries
    -> ;
ERROR 4028 (HY000): A table must have at least one visible column.
mysql> create table tbl_countries(country_id int(5) , country_name varchar(20) , region_id int(15));
Query OK, 0 rows affected, 2 warnings (0.03 sec)

mysql> show tables
    -> ;
+---------------------+
| Tables_in_mysqlday1 |
+---------------------+
| tbl_countries       |
| tbl_employee        |
+---------------------+
2 rows in set (0.00 sec)

mysql> desc 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 countries including columns country_id,country_name and region_id which is already exists.

```
mysql>  create table tbl_countries(country_id int(5) , country_name varchar(20) , region_id int(15));
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 tbl_dup_countries(country_id int(5) , country_name varchar(20) , region_id int(15));
Query OK, 0 rows affected, 2 warnings (0.02 sec)

mysql> desc tbl_dup_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)

mysql> show tables
    -> ;
+---------------------+
| Tables_in_mysqlday1 |
+---------------------+
| tbl_countries       |
| tbl_dup_countries   |
| tbl_employee        |
+---------------------+
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 tbl_dup_countries(country_id int(5) , country_name varchar(20) , region_id int(15));
Query OK, 0 rows affected, 2 warnings (0.02 sec)

mysql> desc tbl_dup_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)

mysql> show tables
    -> ;
+---------------------+
| Tables_in_mysqlday1 |
+---------------------+
| tbl_countries       |
| tbl_dup_countries   |
| tbl_employee        |
+---------------------+
3 rows in set (0.00 sec)
```

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

```
mysql> alter table tbl_countries modify country_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 (0.04 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> alter table tbl_country modify region_id(15) NOT NULL;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version
 for the right syntax to use near '(15) NOT NULL' at line 1
mysql> alter table tbl_countries modify region_id int(15) NOT NULL;
Query OK, 0 rows affected, 1 warning (0.03 sec)
Records: 0  Duplicates: 0  Warnings: 1

mysql> show tables;
+---------------------+
| Tables_in_mysqlday1 |
+---------------------+
| tbl_countries       |
| tbl_dup_countries   |
| tbl_employee        |
+---------------------+
3 rows in set (0.00 sec)

mysql> desc 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 tbl_jobs(job_id int(5) , job_title varchar(10) , min_salary float(15) , max_salary float check(max_salary<=25000));
Query OK, 0 rows affected, 1 warning (0.02 sec)

mysql> show tables;
+---------------------+
| Tables_in_mysqlday1 |
+---------------------+
| tbl_countries       |
| tbl_dup_countries   |
| tbl_employee        |
| tbl_jobs            |
+---------------------+
4 rows in set (0.00 sec)

mysql> desc tbl_jobs;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| job_id     | int         | YES  |     | NULL    |       |
| job_title  | varchar(10) | YES  |     | NULL    |       |
| min_salary | float       | YES  |     | NULL    |       |
| max_salary | float       | 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.

```
mysql> create table tbl_countriesa(country_id int(5) , country_name varchar(15) check(country_name IN('Italy' , 'India' , 'China' )) , region_id int(14));
Query OK, 0 rows affected, 2 warnings (0.02 sec)

mysql> show tables;
+---------------------+
| Tables_in_mysqlday1 |
+---------------------+
| tbl_countries       |
| tbl_countriesa      |
| tbl_dup_countries   |
| tbl_employee        |
| tbl_jobs            |
+---------------------+
5 rows in set (0.00 sec)

mysql> desc tbl_countriesa;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| country_id  | int         | YES  |     | NULL    |       |
| country_name| varchar(15) | YES  |     | NULL    |       |
| region_id   | int         | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

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 '--/--/----'.

```
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 '--/--/---'),
    -> jod_id varchar(10) NOT NULL,
    -> department_id decimal(4,0) NOT NULL
    -> );
Query OK, 0 rows affected (0.04 sec)

mysql> show tables;
+---------------------+
| Tables_in_mysqlday1 |
+---------------------+
| countries           |
| countriesp          |
| job_history         |
| tbl_countries       |
| tbl_countriesa      |
| tbl_countriesc      |
| tbl_countriesf      |
| tbl_dup_countries   |
| tbl_employee        |
| tbl_job             |
| tbl_jobs            |
+---------------------+
11 rows in set (0.00 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    |       |
| jod_id       | varchar(10)  | NO   |     | NULL    |       |
```

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.

```
mysql> CREATE table tbl_countriesf(country_id int(5) UNIQUE , country_name varchar(10) , region_id int(16) );
Query OK, 0 rows affected, 2 warnings (0.03 sec)

mysql> show tables;
+---------------------+
| Tables_in_mysqlday1 |
+---------------------+
| tbl_countries       |
| tbl_countriesa      |
| tbl_countriesf      |
| tbl_dup_countries   |
| tbl_employee        |
| tbl_jobs            |
+---------------------+
6 rows in set (0.00 sec)

mysql> desc tbl_countriesf;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| country_id   | int         | YES  | UNI | NULL    |       |
| country_name | varchar(10) | YES  |     | NULL    |       |
| region_id    | int         | YES  |     | 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.

```
mysql>  create table tbl_job(job_id int(5) , job_title varchar(8) NOT NULL default '' , min_salary float default 8000 , max_salary float default NULL);
Query OK, 0 rows affected, 1 warning (0.02 sec)

mysql> show tables;
+---------------------+
| Tables_in_mysqlday1 |
+---------------------+
| tbl_countries       |
| tbl_countriesa      |
| tbl_countriesf      |
| tbl_dup_countries   |
| tbl_employee        |
| tbl_job             |
| tbl_jobs            |
+---------------------+
7 rows in set (0.00 sec)

mysql> desc tbl_job;
+------------+------------+------+-----+---------+-------+
| Field      | Type       | Null | Key | Default | Extra |
+------------+------------+------+-----+---------+-------+
| job_id     | int        | YES  |     | NULL    |       |
| job_title  | varchar(8) | NO   |     |         |       |
| min_salary | float      | YES  |     | 8000    |       |
| max_salary | float      | 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.

```
mysql> create table tbl_countriesc(country_id int(5) UNIQUE primary key , country_name varchar(15) , region_id int(16));
Query OK, 0 rows affected, 2 warnings (0.03 sec)

mysql> show tables;
+---------------------+
| Tables_in_mysqlday1 |
+---------------------+
| tbl_countries       |
| tbl_countriesa      |
| tbl_countriesc      |
| tbl_countriesf      |
| tbl_dup_countries   |
| tbl_employee        |
| tbl_job             |
| tbl_jobs            |
+---------------------+
8 rows in set (0.00 sec)

mysql> desc tbl_countriesc;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| country_id   | int         | NO   | PRI | NULL    |       |
| country_name | varchar(15) | YES  |     | NULL    |       |
| region_id    | int         | YES  |     | 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.

```
mysql> CREATE TABLE IF NOT EXISTS countries (
    -> COUNTRY_ID integer NOT NULL UNIQUE AUTO_INCREMENT PRIMARY KEY,
    -> COUNTRY_NAME varchar(40) NOT NULL,
    -> REGION_ID decimal(10,0) NOT NULL
    -> );
Query OK, 0 rows affected (0.05 sec)

mysql> show countries;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near 'countries' at
 line 1
mysql> show tables;
+---------------------+
| Tables_in_mysqlday1 |
+---------------------+
| countries           |
| tbl_countries       |
| tbl_countriesa      |
| tbl_countriesc      |
| tbl_countriesf      |
| tbl_dup_countries   |
| tbl_employee        |
| tbl_job             |
| tbl_jobs            |
+---------------------+
9 rows in set (0.00 sec)

mysql> desc countries;
+--------------+---------------+------+-----+---------+----------------+
| Field        | Type          | Null | Key | Default | Extra          |
+--------------+---------------+------+-----+---------+----------------+
| COUNTRY_ID   | int           | NO   | PRI | NULL    | auto_increment |
| COUNTRY_NAME | varchar(40)   | NO   |     | NULL    |                |
| REGION_ID    | decimal(10,0) | NO   |     | 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.

```
mysql> Create table Countriesp (country_id int,country_name varchar(20), region_id int,unique(country_id,region_id));
Query OK, 0 rows affected (0.02 sec)

mysql> show tables;
+---------------------+
| Tables_in_mysqlday1 |
+---------------------+
| countries           |
| countriesp          |
| tbl_countries       |
| tbl_countriesa      |
| tbl_countriesc      |
| tbl_countriesf      |
| tbl_dup_countries   |
| tbl_employee        |
| tbl_job             |
| tbl_jobs            |
+---------------------+
10 rows in set (0.00 sec)

mysql> desc countriesp;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| country_id   | int         | YES  | MUL | NULL    |       |
| country_name | varchar(20) | YES  |     | NULL    |       |
| region_id    | int         | YES  |     | 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.

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 job_historyz (
    -> employee_id int(5) 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 jobs(job_id)
    -> );
Query OK, 0 rows affected, 1 warning (0.03 sec)

mysql> show tables;
+--------------------+
| Tables_in_mysqlday1 |
+--------------------+
| countries          |
| countriesp         |
| job_history        |
| job_historyz       |
| jobs               |
| tbl_countries      |
| tbl_countriesa     |
| tbl_countriesc     |
| tbl_countriesf     |
| tbl_dup_countries  |
| tbl_employee       |
| tbl_job            |
| tbl_joba           |
| tbl_jobs           |
+--------------------+
14 rows in set (0.00 sec)

mysql> desc job_historyz;
+--------------+--------------+------+-----+---------+-------+
| Field        | Type         | Null | Key | Default | Extra |
+--------------+--------------+------+-----+---------+-------+
| employee_id  | int          | 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>
```

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> desc departments;
+-----------------+--------------+------+-----+---------+-------+
| 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    |       |
+-----------------+--------------+------+-----+---------+-------+
4 rows 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)
```

```
mysql> desc tbl_employeeesa;
+-------------+--------------+------+-----+---------+-------+
| 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    |       |
| JOB_ID      | int          | NO   | MUL | NULL    |       |
| SALARY      | decimal(8,2) | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
5 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)
```

```
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)
```