

Lab Comprehensive Test

Database Systems

19th April 2018

General Instructions (In addition to those provided):

- **There are 4 questions.**
- **Make sure to copy the query and the result (both) in a text file failing which you will be given 0 for that question. The text file you save in your system will be the only thing available for the TAs to check your solutions.**
- **Any malpractices will be taken seriously and strict action will be taken.**

You have been provided a new database that contains Employee details. Follow the FAQ to source the new database to your Mysql account.

FAQ

1. How do I source the employee database?

Unzip the archive compre.zip. Keep the sql file (emp.sql), that you just downloaded, in the desktop.

Open Terminal (CTRL+ALT+T)

```
> cd Desktop;
```

```
> mysql -u root -p
```

```
password: 123456
```

Now, drop all available EMDB, EMPLOYEE, Employee, Emp, EMP, MYEMPLOYEE

databases (if any). Don't delete other databases and schemas.
[caution]

Now create a database: EMPDB

```
mysql> CREATE DATABASE EMPDB;
```

```
mysql> USE EMPDB;
```

Source the emp.sql from EMPDB database.

```
mysql> source emp.sql
```

```
mysql> SHOW TABLES;
```

2. Is there partial marking?

No. And, you should not ask for it. Each question carries 10 marks. Marking scheme: 0 or 10.

3. What is the duration of the test?

1 Hr. 15 Minutes; You must switch off the monitor once announced and leave the lab immediately.

4. Can we get help from TAs or instructors?

Only in case of situations which prove extremely beneficial to society.

5. What is the penalty for malpractice?

You will be awarded 0 in today's test. The person with whom do you share and from whom did you copy will also get 0.

-EMPDB SCHEMA-

The EMPDB database contains the following relations.

EMPLOYEE (empno, name, job, boss, hiredate, salary, comm, deptno);

DEPARTMENT (deptno, name, location);

SALARYGRADE (grade, losal, hisal);

BONUS (ename, job, sal, comm);

PROJECT (projectno, description, start_date, end_date);

PROJECT_PARTICIPATION (projectno, empno, start_date, end_date, role_id);

ROLE (role_id, description);

For more information, you should use SHOW TABLES query.

-QUESTIONS-

Q1. For each employee display the following employee information. Do this for all employees except those **only** working on “High Capacity Optical Networks”.

NOTE: End date of NULL implies that employee is still working on the project.

The following information should be displayed for each employee and the entries should be displayed in ascending order of salary grade.

- empno
- empname
- job name
- boss name
- hiredate
- salarygrade
- comm
- dept name
- role in the project
- place of work
- experience where experience is derived from the no of days spent working on the project :
 - o if no of days < 1 year (365 days) then output noob
 - o else output pro
- project name

Q2. In cryptography, a Caesar cipher is one of the simplest and most widely known encryption techniques. It is a type of substitution cipher in which each letter in the plaintext is replaced by a letter some fixed number of positions (called the key K of the cipher) up/down the alphabet. For example, with a shift of 3 and $\text{Direction}=0$, 'D' would be replaced by 'A', E would become B, and so on.

Write a procedure `Caesar_Encrypt` which takes Julius' secret code as an input in the form of a string, a secret key ' K ' as an integer and $\text{Direction}(0:\text{down}/1:\text{up})$. This procedure should print the encrypted string. You may assume that the input string is always lowercase.

NOTE: THE VALUE OF K MAY EXCEED 26.

Eg: "subway" with $K=3$ and $\text{Direction}=1$ should return "vxezdb"

"vxezdb" with $K=3$ and $\text{Direction}=0$ should return "subway"

Hint: You may use the inbuilt mysql function if required-

`SUBSTRING(myString, startpos, length)`; returns the first 'length' characters of the string starting from `startpos`. (Experiment yourself for further clarifications)

`ASCII(character)` returns the ascii value of the character.

`ascii('a')` returns 97.

Q3. [Statutory warning: This question might modify your existing database. If you are worried, create a new database EMPDB1. Then, source emp.sql to the new database. And, then solve it.]

Create an audit table which maintains a log of each insert, update and delete in the employee table. Audit table contains the original entries (not the ones after some change has been made).

Do the following operations:

Insert:

8000, Ramesh, Salesman, 7782, 2012-10-15, 1200, 200, 30

7777, Suresh, Clerk, 8000, 2012-11-22, 900, null, 20

7799, Naresh, Manager, 7839, 2012-05-05, 3000, 0, 20

8888, Mukesh, Analyst, 7566, 2012-04-30, 3200, 100, 20

Update:

“7777, Suresh, Clerk, 8000, 2012-11-22, 900, null, 20” TO “7777, Suresh, Salesman, 8000,

2012-11-22, 1300, null, 30”

“7799, Naresh, Manager, 7839, 2012-05-05, 3000, 0, 20” TO “7799, Naresh, Clerk, 7839, 2012-

07-26, 900, 0, 20”

Delete:

empno 8000 and 8888

After these,

Create a table with the fields (empno ,salary, comm,net salary, grade)

Calculate the net salary as Salary – comm (take null as zero) and output the grade as per the salarygrade table.

[12]

Q4. Display FALSE value for respective ISBN in the BOOK table when STOCK is zero. Students must use TRIGGER in the answer for the following data.

```
create table AUCTION (A_NO VARCHAR(10), ISBN  
VARCHAR(10));
```

```
create table BOOK (ISBN VARCHAR(10), STOCK  
VARCHAR(10));
```

```
insert into AUCTION values ('A1', 'B1'), ('A1', 'B2'), ('A2',  
'B2'), ('A2', 'B3'), ('A3', 'B4'), ('A4', 'B1'), ('A4', 'B5');
```

```
insert into BOOK values('B1', 2), ('B2', 2), ('B3', 1), ('B4',  
1), ('B5', 1);
```

[4]