

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY, KTR CAMPUS

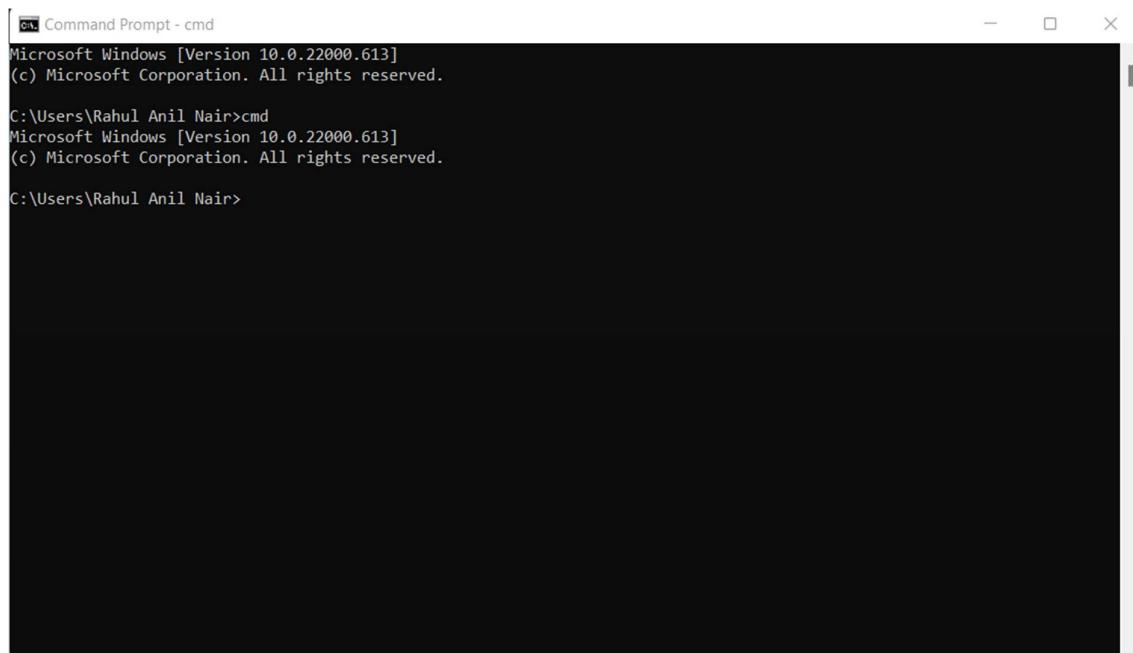
FACULTY OF ENGINEERING TECHNOLOGY

END SEMESTER UNIVERSITY EXAMINATION MAY 2022

18CSC364J - INFORMATION SECURITY LAB

LIST OF EXPERIMENTS

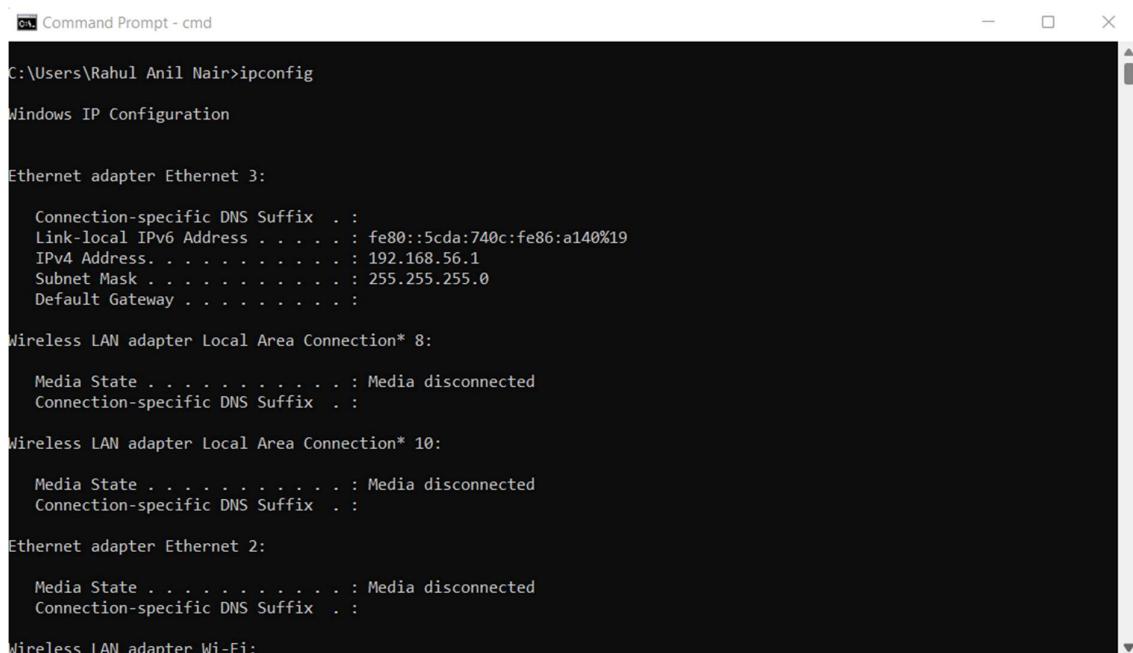
1. To Execute and Simulate basic Network Security Commands



```
Command Prompt - cmd
Microsoft Windows [Version 10.0.22000.613]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Rahul Anil Nair>cmd
Microsoft Windows [Version 10.0.22000.613]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Rahul Anil Nair>
```



```
Command Prompt - cmd
C:\Users\Rahul Anil Nair>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet 3:

    Connection-specific DNS Suffix . :
    Link-local IPv6 Address . . . . . : fe80::5cda:740c:fe86:a140%19
    IPv4 Address . . . . . : 192.168.56.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :

Wireless LAN adapter Local Area Connection* 8:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :

Wireless LAN adapter Local Area Connection* 10:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :

Ethernet adapter Ethernet 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :

Wireless LAN adapter Wi-Fi:
```

```
C:\Users\Rahul Anil Nair>ipconfig/all

Windows IP Configuration

Host Name . . . . . : LAPTOP-LR3TB656
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Ethernet 3:

Connection-specific DNS Suffix . . . . . :
Description . . . . . : VirtualBox Host-Only Ethernet Adapter
Physical Address . . . . . : 0A-00-27-00-00-13
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::5cda:740c:fe86:a140%19(Preferred)
IPv4 Address . . . . . : 192.168.56.1(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . :
DHCPv6 IAID . . . . . : 940179495
DHCPv6 Client DUID. . . . . : 00-01-00-01-29-0B-49-02-18-CC-18-28-5A-DC
NetBIOS over Tcpip. . . . . : Enabled

Wireless LAN adapter Local Area Connection* 8:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . . . . :
```

```
C:\Users\Rahul Anil Nair>ipconfig/release

Windows IP Configuration

No operation can be performed on Local Area Connection* 8 while it has its media disconnected.
No operation can be performed on Local Area Connection* 10 while it has its media disconnected.
No operation can be performed on Bluetooth Network Connection while it has its media disconnected.

Ethernet adapter Ethernet 3:

Connection-specific DNS Suffix . . . . . :
Link-local IPv6 Address . . . . . : fe80::5cda:740c:fe86:a140%19
IPv4 Address . . . . . : 192.168.56.1
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . :

Wireless LAN adapter Local Area Connection* 8:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . . . . :

Wireless LAN adapter Local Area Connection* 10:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . . . . :

Ethernet adapter Ethernet 2:

Media State . . . . . : Media disconnected
```

```
C:\Users\Rahul Anil Nair>ipconfig/renew

Windows IP Configuration

No operation can be performed on Local Area Connection* 8 while it has its media disconnected.
No operation can be performed on Local Area Connection* 10 while it has its media disconnected.
No operation can be performed on Ethernet 2 while it has its media disconnected.
No operation can be performed on Bluetooth Network Connection while it has its media disconnected.

Ethernet adapter Ethernet 3:

Connection-specific DNS Suffix . . . .
Link-local IPv6 Address . . . . . : fe80::5cda:740c:fe86:a140%19
IPv4 Address . . . . . : 192.168.56.1
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . :

Wireless LAN adapter Local Area Connection* 8:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . . .

Wireless LAN adapter Local Area Connection* 10:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . . .

Ethernet adapter Ethernet 2:
```

```
C:\Users\Rahul Anil Nair>ping www.google.co.in

Pinging www.google.co.in [2404:6800:4007:819::2003] with 32 bytes of data:
Reply from 2404:6800:4007:819::2003: time=7ms
Reply from 2404:6800:4007:819::2003: time=8ms
Reply from 2404:6800:4007:819::2003: time=8ms
Reply from 2404:6800:4007:819::2003: time=9ms

Ping statistics for 2404:6800:4007:819::2003:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 7ms, Maximum = 9ms, Average = 8ms

C:\Users\Rahul Anil Nair>
```

```
C:\ Command Prompt - cmd - nslookup  
C:\Users\Rahul Anil Nair>nslookup  
Default Server: RTK_GW  
Address: 192.168.1.1  
  
> www.google.co.in  
Server: RTK_GW  
Address: 192.168.1.1  
  
Non-authoritative answer:  
Name: www.google.co.in  
Addresses: 2404:6800:4007:819::2003  
142.250.195.163  
>
```

```
C:\ Command Prompt - cmd  
C:\Users\Rahul Anil Nair>nslookup www.google.co.in  
Server: RTK_GW  
Address: 192.168.1.1  
  
Non-authoritative answer:  
Name: www.google.co.in  
Addresses: 2404:6800:4007:80a::2003  
216.58.196.163  
  
C:\Users\Rahul Anil Nair>
```

Command Prompt - cmd

```
C:\Users\Rahul Anil Nair>hostname  
LAPTOP-LR3TB656  
C:\Users\Rahul Anil Nair>
```

Command Prompt - cmd

```
C:\Users\Rahul Anil Nair>getmac  
Physical Address      Transport Name  
=====  =====  
00-FF-FA-5F-63-A7    Media disconnected  
18-CC-18-28-5A-DC    \Device\Tcpip_{40F56CEA-B1D6-447B-8E44-07183AE82C56}  
18-CC-18-28-5A-E0    Media disconnected  
0A-00-27-00-00-13    \Device\Tcpip_{FF578BA6-2117-4AFB-80C1-A8361267AC8F}  
C:\Users\Rahul Anil Nair>
```

```

C:\ Command Prompt - cmd
C:\Users\Rahul Anil Nair>netstat
Active Connections

  Proto  Local Address        Foreign Address      State
  TCP    127.0.0.1:1050      LAPTOP-LR3TB656:22303 ESTABLISHED
  TCP    127.0.0.1:2103      LAPTOP-LR3TB656:2104 ESTABLISHED
  TCP    127.0.0.1:2104      LAPTOP-LR3TB656:2103 ESTABLISHED
  TCP    127.0.0.1:9969      LAPTOP-LR3TB656:9970 ESTABLISHED
  TCP    127.0.0.1:9970      LAPTOP-LR3TB656:9969 ESTABLISHED
  TCP    127.0.0.1:22303     LAPTOP-LR3TB656:1050 ESTABLISHED
  TCP    127.0.0.1:49671     LAPTOP-LR3TB656:49672 ESTABLISHED
  TCP    127.0.0.1:49672     LAPTOP-LR3TB656:49671 ESTABLISHED
  TCP    127.0.0.1:49673     LAPTOP-LR3TB656:49674 ESTABLISHED
  TCP    127.0.0.1:49674     LAPTOP-LR3TB656:49673 ESTABLISHED
  TCP    127.0.0.1:49675     LAPTOP-LR3TB656:49676 ESTABLISHED
  TCP    127.0.0.1:49676     LAPTOP-LR3TB656:49675 ESTABLISHED
  TCP    127.0.0.1:49692     LAPTOP-LR3TB656:49693 ESTABLISHED
  TCP    127.0.0.1:49693     LAPTOP-LR3TB656:49692 ESTABLISHED
  TCP    192.168.1.11:2051    20.198.162.76:https ESTABLISHED
  TCP    192.168.1.11:2054    20.198.162.76:https ESTABLISHED
  TCP    192.168.1.11:2063    113.29.117.24:https ESTABLISHED
  TCP    192.168.1.11:2065    180.87.4.152:https ESTABLISHED
  TCP    192.168.1.11:2071    server-205-251-253-17:https CLOSE_WAIT
  TCP    192.168.1.11:2073    ec2-35-174-127-31:https ESTABLISHED
  TCP    192.168.1.11:2087    ec2-52-2-219-0:https ESTABLISHED
  TCP    192.168.1.11:2094    ec2-35-74-219-30:https ESTABLISHED
  TCP    192.168.1.11:2101    e2a:https TIME_WAIT
  TCP    192.168.1.11:2105    212.73.235.31:https ESTABLISHED

C:\ Command Prompt - cmd
C:\Users\Rahul Anil Nair>arp -
Interface: 192.168.1.11 --- 0x7
  Internet Address      Physical Address      Type
  192.168.1.1           f8-c4-f3-8e-eb-01  dynamic
  192.168.1.255         ff-ff-ff-ff-ff-ff  static
  224.0.0.2              01-00-5e-00-00-02  static
  224.0.0.22             01-00-5e-00-00-16  static
  224.0.0.251            01-00-5e-00-00-fb  static
  224.0.0.252            01-00-5e-00-00-fc  static
  239.255.255.250       01-00-5e-7f-ff-fa  static
  255.255.255.255       ff-ff-ff-ff-ff-ff  static

Interface: 192.168.56.1 --- 0x13
  Internet Address      Physical Address      Type
  192.168.56.255        ff-ff-ff-ff-ff-ff  static
  224.0.0.2              01-00-5e-00-00-02  static
  224.0.0.22             01-00-5e-00-00-16  static
  224.0.0.251            01-00-5e-00-00-fb  static
  224.0.0.252            01-00-5e-00-00-fc  static
  239.255.255.250       01-00-5e-7f-ff-fa  static
  255.255.255.255       ff-ff-ff-ff-ff-ff  static

C:\Users\Rahul Anil Nair>

```

- 2. To implement and execute access control commands in MySql**
Done in 6,7,8,9,10. Not going to do it again.
- 3. To implement and execute security commands in Linux**

DEBUG TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT

```
root@goorm:/workspace/Ubuntu# ls
README.md goorm.manifest index.py
root@goorm:/workspace/Ubuntu# ls -l
total 12
-rw-r--r-- 1 root root 2000 Jan 12 2021 README.md
-rw-rw-r-- 1 root root 670 May 6 11:00 goorm.manifest
-rw-r--r-- 1 root root 22 Nov 13 2020 index.py
root@goorm:/workspace/Ubuntu# cat >abc
how are you
hello i am amazing
^C
root@goorm:/workspace/Ubuntu# cat abc
how are you
hello i am amazing
root@goorm:/workspace/Ubuntu# touch file1 file2 file3
root@goorm:/workspace/Ubuntu# ls
```

Net R 0 B/s Net S 0 B/s

DEBUG TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT

```
how are you
hello i am amazing
^C
root@goorm:/workspace/Ubuntu# cat abc
how are you
hello i am amazing
root@goorm:/workspace/Ubuntu# touch file1 file2 file3
root@goorm:/workspace/Ubuntu# ls
README.md abc file1 file2 file3 goorm.manifest index.py
root@goorm:/workspace/Ubuntu# useradd friend
root@goorm:/workspace/Ubuntu# passwd
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
root@goorm:/workspace/Ubuntu# login friend
```

Net R 0 B/s Net S 0 B/s

DEBUG TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT

```
Password:
Login incorrect
goorm login: ^C
root@goorm:/workspace/Ubuntu# useradd phantom
root@goorm:/workspace/Ubuntu# passwd phantom
New password:
Retype new password:
Sorry, passwords do not match.
New password:
Retype new password:
passwd: password updated successfully
root@goorm:/workspace/Ubuntu# login phantom
Password:
Welcome to Ubuntu 18.04.2 LTS (GNU/Linux 4.4.0-1128-aws x86_64)
```

Net R 0 B/s Net S 0 B/s

```
DEBUG TERMINAL ⚡ SEARCH RESOURCE MONITOR LINT

Sorry, passwords do not match.
New password:
Retype new password:
passwd: password updated successfully
root@goorm:/workspace/Ubuntu# login phantom
Password:
Welcome to Ubuntu 18.04.2 LTS (GNU/Linux 4.4.0-1128-aws x86_64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/advantage

This system has been minimized by removing packages and content that are
not required on a system that users do not log into.

To restore this content, you can run the 'unminimize' command.

Net R 0 B/s Net S 0 B/s
```

```
DEBUG TERMINAL ⚡ SEARCH RESOURCE MONITOR LINT

Cannot make/remove an entry for the specified session
root@goorm:/workspace/Ubuntu# chmod +x file3
root@goorm:/workspace/Ubuntu# ls -l
total 16
-rw-r--r-- 1 root root 2000 Jan 12 2021 README.md
-rw-rw-r-- 1 root root 31 May 6 11:06 abc
-rw-rw-r-- 1 root root 0 May 6 11:06 file1
-rw-rw-r-- 1 root root 0 May 6 11:06 file2
-rwxrwxr-x 1 root root 0 May 6 11:06 file3
-rw-rw-r-- 1 root root 670 May 6 11:00 goorm.manifest
-rw-r--r-- 1 root root 22 Nov 13 2020 index.py
root@goorm:/workspace/Ubuntu# chmod -x file3
root@goorm:/workspace/Ubuntu# ls -l
total 16
-rw-r--r-- 1 root root 2000 Jan 12 2021 README.md

Net R 0 B/s Net S 0 B/s
```

```
DEBUG TERMINAL ⚡ SEARCH RESOURCE MONITOR LINT

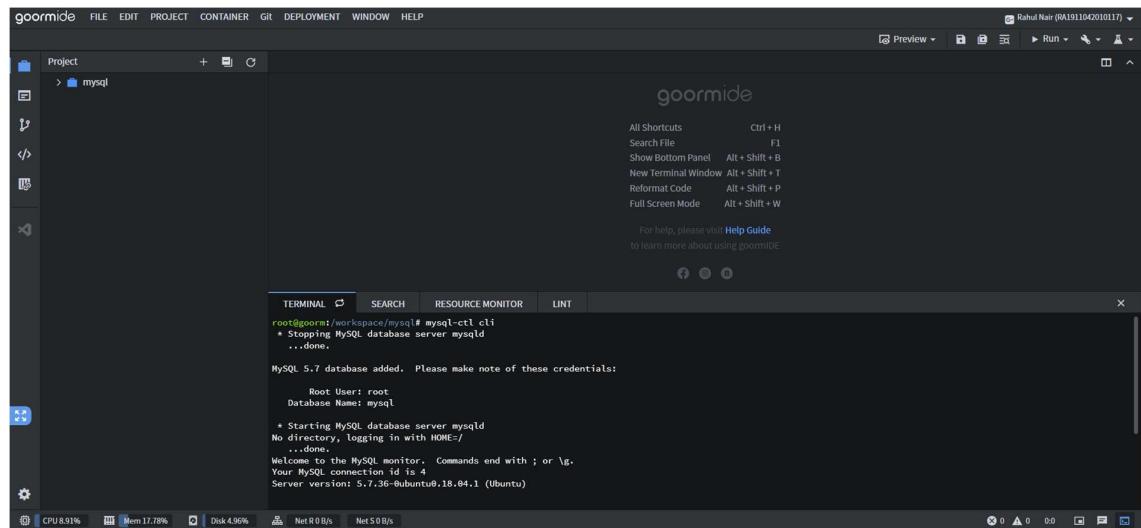
-rw-rw-r-- 1 root root 31 May 6 11:06 abc
-rw-rw-r-- 1 root root 0 May 6 11:06 file1
-rw-rw-r-- 1 root root 0 May 6 11:06 file2
-rw-rw-r-- 1 root root 0 May 6 11:06 file3
-rw-rw-r-- 1 root root 670 May 6 11:00 goorm.manifest
-rw-r--r-- 1 root root 22 Nov 13 2020 index.py
root@goorm:/workspace/Ubuntu# chmod u-x,g+w,o-rw file2
root@goorm:/workspace/Ubuntu# ls -l
total 16
-rw-r--r-- 1 root root 2000 Jan 12 2021 README.md
-rw-rw-r-- 1 root root 31 May 6 11:06 abc
-rw-rw-r-- 1 root root 0 May 6 11:06 file1
-rw-rw---- 1 root root 0 May 6 11:06 file2
-rw-rw-r-- 1 root root 0 May 6 11:06 file3
-rw-rw-r-- 1 root root 670 May 6 11:00 goorm.manifest
-rw-r--r-- 1 root root 22 Nov 13 2020 index.py

Net R 0 B/s Net S 0 B/s
```

4. To implement security policies in Ubuntu OS environment

- 5. To implement IDS system using Snort tool in Linux Environment**
- 6. Create the three user defined roles that are shown in the following table and assign the specified permissions for the CUSTOMER table**

ROLE	SELECT	INSERT	UPDATE	DELETE
Account_Manager	✓		✓	✓
Customer_Service	✓			
Sales_Reps	✓	✓	✓	



This screenshot shows the same terminal session as the previous one, but with the MySQL prompt visible at the bottom. The user has run several commands to create a database, switch to it, create a table, and create two new users with specific privileges.

```
TERMINAL 🔍 SEARCH RESOURCE MONITOR LINT
Query OK, 0 rows affected (0.00 sec)

mysql> CREATE USER 'SALES_REPS' IDENTIFIED BY 'root2';
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT ON CUSTOMERS.CUSTOMER TO ACCOUNT_MANAGER;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT UPDATE,DELETE ON CUSTOMERS.CUSTOMER TO ACCOUNT_MANAGER;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT ON CUSTOMERS.CUSTOMER TO CUSTOMER_SERVICE;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT,INSERT,UPDATE ON CUSTOMERS.CUSTOMER TO SALES_REPS;
Query OK, 0 rows affected (0.00 sec)

Disk Net R 0 B/s Net S 0 B/s
```

```
TERMINAL 🔍 SEARCH RESOURCE MONITOR LINT
+-----+
2 rows in set (0.00 sec)

mysql> SHOW GRANTS FOR ACCOUNT_MANAGER;
+-----+
| Grants for ACCOUNT_MANAGER@%
+-----+
| GRANT USAGE ON *.* TO 'ACCOUNT_MANAGER'@'%'
| GRANT SELECT, UPDATE, DELETE ON `CUSTOMERS`.`CUSTOMER` TO 'ACCOUNT_MANAGER'@'%'
+-----+
2 rows in set (0.00 sec)

mysql> SHOW GRANTS FOR CUSTOMER_SERVICE;
+-----+
| Grants for CUSTOMER_SERVICE@%
+-----+
Disk Net R 0 B/s Net S 0 B/s
```

```
TERMINAL 🔍 SEARCH RESOURCE MONITOR LINT
| GRANT SELECT, UPDATE, DELETE ON `CUSTOMERS`.`CUSTOMER` TO 'ACCOUNT_MANAGER'@'%'
+-----+
2 rows in set (0.00 sec)

mysql> SHOW GRANTS FOR CUSTOMER_SERVICE;
+-----+
| Grants for CUSTOMER_SERVICE@%
+-----+
| GRANT USAGE ON *.* TO 'CUSTOMER_SERVICE'@'%'
| GRANT SELECT ON `CUSTOMERS`.`CUSTOMER` TO 'CUSTOMER_SERVICE'@'%'
+-----+
2 rows in set (0.00 sec)

mysql> SHOW GRANTS FOR SALES_REP;
ERROR 1141 (42000): There is no such grant defined for user 'SALES_REP' on host '%'
mysql> SHOW GRANTS FOR SALES_REPS;

Disk Net R 0 B/s Net S 0 B/s
```

```

TERMINAL 🔍 SEARCH RESOURCE MONITOR LINT
+-----+
| GRANT USAGE ON *.* TO 'CUSTOMER_SERVICE'@'%' |
| GRANT SELECT ON `CUSTOMERS`.`CUSTOMER` TO 'CUSTOMER_SERVICE'@'%' |
+-----+
2 rows in set (0.00 sec)

mysql> SHOW GRANTS FOR SALES REP;
ERROR 1141 (42000): There is no such grant defined for user 'SALES REP' on host '%'
mysql> SHOW GRANTS FOR SALES REPS;
+-----+
| Grants for SALES REPS@% |
+-----+
| GRANT USAGE ON *.* TO 'SALES REPS'@'%' |
| GRANT SELECT, INSERT, UPDATE ON `CUSTOMERS`.`CUSTOMER` TO 'SALES REPS'@'%' |
+-----+
2 rows in set (0.00 sec)

```

7. Create a Database of Customer and Create the following application roles with corresponding Permissions

Role	Permission
Sales	Select, Update, Insert into Customers and Orders, Order_Details
Sales_Manager	Sales and Delete on Orders and Order Details

```

TERMINAL 🔍 SEARCH RESOURCE MONITOR LINT
Copyright (c) 2000, 2021, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> CREATE DATABASE CUSTOMER;
Query OK, 1 row affected (0.06 sec)

mysql> use CUSTOMER;
Database changed
mysql> CREATE TABLE CUSTOMERS(FIRSTNAME VARCHAR(25),LASTNAME VARCHAR(25),ONO INT(2),PHNO INT(10));
Query OK, 0 rows affected (0.10 sec)

```

```
TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT

mysql> CREATE DATABASE CUSTOMER;
Query OK, 1 row affected (0.06 sec)

mysql> use CUSTOMER;
Database changed
mysql> CREATE TABLE CUSTOMERS(FIRSTNAME VARCHAR(25),LASTNAME VARCHAR(25),ONO INT(2),PHNO INT(10));
Query OK, 0 rows affected (0.10 sec)

mysql> CREATE TABLE ORDERS(ONO INT(2),ONAME VARCHAR(25));
Query OK, 0 rows affected (0.15 sec)

mysql> CREATE TABLE ORDER_DETAILS(ONO INT(2),QTY INT(3),PRICE INT(5));
Query OK, 0 rows affected (0.10 sec)

mysql> CREATE USER 'SALES' IDENTIFIED BY 'root';
Query OK, 0 rows affected (0.03 sec)
```

```
TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT

mysql> CREATE USER 'SALES_MANAGER' IDENTIFIED BY 'root1';
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT,UPDATE,INSERT ON CUSTOMER.CUSTOMERS TO SALES;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT,UPDATE,INSERT ON CUSTOMER.ORDERS TO SALES;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT,UPDATE,INSERT ON CUSTOMER.ORDER_DETAILS TO SALES;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT,UPDATE,INSERT ON CUSTOMER.CUSTOMERS TO SALES_MANAGER;
Query OK, 0 rows affected (0.00 sec)
```

```
Net R 0 B/s Net S 0 B/s TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT

OR SALES' at line 1
mysql> SHOW GRANTS FOR SALES;
+-----+-----+
| Grants for SALES@%                                |
+-----+-----+
| GRANT USAGE ON *.* TO 'SALES'@'%'                |
| GRANT SELECT, INSERT, UPDATE ON `CUSTOMER`.`ORDERS` TO 'SALES'@'%' |
| GRANT SELECT, INSERT, UPDATE ON `CUSTOMER`.`ORDER_DETAILS` TO 'SALES'@'%' |
| GRANT SELECT, INSERT, UPDATE ON `CUSTOMER`.`CUSTOMERS` TO 'SALES'@'%'    |
+-----+-----+
4 rows in set (0.00 sec)

mysql> SHOW GRANTS FOR SALES_MANAGER;
+-----+-----+
| Grants for SALES_MANAGER@%                         |
+-----+-----+
```

```

TERMINAL 🔍 SEARCH RESOURCE MONITOR LINT
+-----+
| GRANT SELECT, INSERT, UPDATE ON `CUSTOMER`.`CUSTOMERS` TO 'SALES'@'%'      |
+-----+
4 rows in set (0.00 sec)

mysql> SHOW GRANTS FOR SALES_MANAGER;
+-----+
| Grants for SALES_MANAGER@%                                         |
+-----+
| GRANT USAGE ON *.* TO 'SALES_MANAGER'@'%'                         |
| GRANT SELECT, INSERT, UPDATE, DELETE ON `CUSTOMER`.`ORDER_DETAILS` TO 'SALES_MANAGER'@'%' |
| GRANT SELECT, INSERT, UPDATE ON `CUSTOMER`.`CUSTOMERS` TO 'SALES_MANAGER'@'%'           |
| GRANT SELECT, INSERT, UPDATE, DELETE ON `CUSTOMER`.`ORDERS` TO 'SALES_MANAGER'@'%'        |
+-----+
4 rows in set (0.00 sec)

mysql> █

```

8. You have been hired as an Oracle/SQL Database Administrator by a small Company for the primary task of creating a security model which consists of three levels

READ Level

UPDATE and INSERT Level

DELETE Level

This Model will be using tables owned by HR Schema

```

TERMINAL 🔍 SEARCH RESOURCE MONITOR LINT
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> CREATE DATABASE HR;
Query OK, 1 row affected (0.00 sec)

mysql> use HR;
Database changed
mysql> CREATE TABLE COUNTRIES(COUNTRY_ID CHAR(2),COUNTRY_NAME VARCHAR(20),REGION_ID NUMBER);
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server ver
' at line 1
mysql> CREATE TABLE COUNTRIES(COUNTRY_ID CHAR(2),COUNTRY_NAME VARCHAR(20),REGION_ID INT(3));
Query OK, 0 rows affected (0.22 sec)

█ Net R 0 B/s Net S 0 B/s

```

```

TERMINAL 🔍 SEARCH RESOURCE MONITOR LINT
mysql> CREATE TABLE REGIONS(REGION_ID INT(3),REGION_NAME VARCHAR(25));
Query OK, 0 rows affected (0.11 sec)

mysql> CREATE TABLE LOCATIONS(LOCATION_ID INT(4),STREET_ADDRESS VARCHAR(40),POSTAL_CODE VARCHAR(12),CITY VARCHAR(30),STATE_PRO
);
Query OK, 0 rows affected (0.31 sec)

mysql> CREATE TABLE DEPARTMENTS(DEPARTMENT_ID INT(4),DEPARTMENT_NAME VARCHAR(30),MANAGER_ID INT(6),LOCATION_ID INT(4));
Query OK, 0 rows affected (0.07 sec)

mysql> CREATE TABLE EMPLOYEES(EMPLOYEE_ID INT(6),FIRST_NAME VARCHAR(20),LAST_NAME VARCHAR(25),EMAIL VARCHAR(25),PHONE_NUMBER I
(20),SALARY INT(8),COMMISSION_PCT INT(8),MANAGER_ID INT(6),DEPARTMENT_ID INT(4));
Query OK, 0 rows affected (0.07 sec)

mysql> CREATE TABLE JOBS(JOB_ID VARCHAR(10),JOB_TITLE VARCHAR(35),MIN_SALARY INT(6),MAX_SALARY INT(6));
Query OK, 0 rows affected (0.13 sec)

█ Net R 0 B/s Net S 0 B/s

```

```
TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT
Query OK, 0 rows affected (0.07 sec)

mysql> CREATE TABLE EMPLOYEES(EMPLOYEE_ID INT(6),FIRST_NAME VARCHAR(20),LAST_NAME VARCHAR(25),EMAIL VARCHAR(25),PHONE_NUMBER INT(10)(20),SALARY INT(8),COMMISSION_PCT INT(8),MANAGER_ID INT(6),DEPARTMENT_ID INT(4));
Query OK, 0 rows affected (0.07 sec)

mysql> CREATE TABLE JOBS(JOB_ID VARCHAR(10),JOB_TITLE VARCHAR(35),MIN_SALARY INT(6),MAX_SALARY INT(6));
Query OK, 0 rows affected (0.13 sec)

mysql> CREATE TABLE JOB_HISTORY(EMPLOYEE_ID INT(6),START_DATE DATE,END_DATE DATE,JOB_ID VARCHAR(10),DEPARTMENT INT(4));
Query OK, 0 rows affected (0.08 sec)

mysql> CREATE USER 'HR' IDENTIFIED BY 'hr1';
Query OK, 0 rows affected (0.10 sec)

mysql> CREATE USER 'EMP' IDENTIFIED BY 'empl';
Net R 0 B/s Net S 0 B/s
```

```
TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT
Query OK, 0 rows affected (0.00 sec)

mysql> CREATE USER 'FOUNDER' IDENTIFIED BY 'found';
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT ON HR.COUNTRIES TO EMP;
Query OK, 0 rows affected (0.03 sec)

mysql> GRANT SELECT ON HR.EMPLOYEES TO EMP;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT ON HR.LOCATIONS TO EMP;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT ON HR.REGIONS TO EMP;
Query OK, 0 rows affected (0.00 sec)

Net R 0 B/s Net S 0 B/s
```

```
TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT
mysql> GRANT SELECT,UPDATE,INSERT ON HR.COUNTRIES TO HR;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT,UPDATE,INSERT ON HR.DEPARTMENTS TO HR;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT,UPDATE,INSERT ON HR.EMPLOYEES TO HR;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT,UPDATE,INSERT ON HR.Jobs TO HR;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT,UPDATE,INSERT ON HR.JOB_HISTORY TO HR;
Query OK, 0 rows affected (0.10 sec)

Net R 0 B/s Net S 0 B/s
```

```
TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT

mysql> GRANT SELECT,UPDATE,INSERT,DELETE ON HR.DEPARTMENTS TO FOUNDER;
Query OK, 0 rows affected (0.01 sec)

mysql> GRANT SELECT,UPDATE,INSERT,DELETE ON HR.EMPLOYEES TO FOUNDER;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT,UPDATE,INSERT,DELETE ON HR.JOBS TO FOUNDER;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT,UPDATE,INSERT,DELETE ON HR.JOB_HISTORY TO FOUNDER;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT,UPDATE,INSERT,DELETE ON HR.LOCATIONS TO FOUNDER;
Query OK, 0 rows affected (0.00 sec)
```

```
Net R 0 B/s Net S 0 B/s
```

```
TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT

mysql> GRANT SELECT,UPDATE,INSERT,DELETE ON HR.REGIONS TO FOUNDER;
Query OK, 0 rows affected (0.00 sec)

mysql> SHOW GRANTS FOR EMP;
+-----+
| Grants for EMP@% |
+-----+
| GRANT USAGE ON *.* TO 'EMP'@'%' |
| GRANT SELECT ON `HR`.`REGIONS` TO 'EMP'@'%' |
| GRANT SELECT ON `HR`.`COUNTRIES` TO 'EMP'@'%' |
| GRANT SELECT ON `HR`.`LOCATIONS` TO 'EMP'@'%' |
| GRANT SELECT ON `HR`.`EMPLOYEES` TO 'EMP'@'%' |
+-----+
5 rows in set (0.09 sec)

mysql> SHOW GRANTS FOR HR;
```

```
Net R 0 B/s Net S 0 B/s
```

```
TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT

| GRANT SELECT ON `HR`.`REGIONS` TO 'EMP'@'%' |
| GRANT SELECT ON `HR`.`COUNTRIES` TO 'EMP'@'%' |
| GRANT SELECT ON `HR`.`LOCATIONS` TO 'EMP'@'%' |
| GRANT SELECT ON `HR`.`EMPLOYEES` TO 'EMP'@'%' |
+-----+
5 rows in set (0.09 sec)

mysql> SHOW GRANTS FOR HR;
+-----+
| Grants for HR@% |
+-----+
| GRANT USAGE ON *.* TO 'HR'@'%' |
| GRANT SELECT, INSERT, UPDATE ON `HR`.`JOB_HISTORY` TO 'HR'@'%' |
| GRANT SELECT, INSERT, UPDATE ON `HR`.`EMPLOYEES` TO 'HR'@'%' |
| GRANT SELECT, INSERT, UPDATE ON `HR`.`LOCATIONS` TO 'HR'@'%' |
| GRANT SELECT, INSERT, UPDATE ON `HR`.`REGIONS` TO 'HR'@'%' |
+-----+
```

```
Net R 0 B/s Net S 0 B/s
```

```

TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT

DER' at line 1
mysql> SHOW GRANTS FOR FOUNDER;
+-----+
| Grants for FOUNDER@% |
+-----+
| GRANT USAGE ON *.* TO 'FOUNDER'@'%'
| GRANT SELECT, INSERT, UPDATE, DELETE ON `HR`.`JOB_HISTORY` TO 'FOUNDER'@'%'
| GRANT SELECT, INSERT, UPDATE, DELETE ON `HR`.`EMPLOYEES` TO 'FOUNDER'@'%'
| GRANT SELECT, INSERT, UPDATE, DELETE ON `HR`.`REGIONS` TO 'FOUNDER'@'%'
| GRANT SELECT, INSERT, UPDATE, DELETE ON `HR`.`JOBS` TO 'FOUNDER'@'%'
| GRANT SELECT, INSERT, UPDATE, DELETE ON `HR`.`LOCATIONS` TO 'FOUNDER'@'%'
| GRANT SELECT, INSERT, UPDATE, DELETE ON `HR`.`DEPARTMENTS` TO 'FOUNDER'@'%'
| GRANT SELECT, INSERT, UPDATE, DELETE ON `HR`.`COUNTRIES` TO 'FOUNDER'@'%'
+-----+
8 rows in set (0.00 sec)

Net R 0 B/s Net S 0 B/s

```

9. Using the Concepts in the Security data model based on application table, set up the following permission for the AUTHORS table in the Database

USER	ACCESS
John	Select, Update, Insert
Jane	Select, Update, Insert, Delete
Sally	Select

```

TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT

owners.

mysql> CREATE DATABASE AUTHORS;
Query OK, 1 row affected (0.00 sec)

mysql> use AUTHORS;
Database changed
mysql> CREATE TABLE AUTHOR(ANO INT(2),ANAME VARCHAR(25),BOOKNO INT(3));
Query OK, 0 rows affected (0.07 sec)

mysql> CREATE USER 'John' IDENTIFIED BY 'root';
Query OK, 0 rows affected (0.00 sec)

mysql> CREATE USER 'Jane' IDENTIFIED BY 'root1';
Query OK, 0 rows affected (0.00 sec)

```

```
TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT

mysql> CREATE USER 'Sally' IDENTIFIED BY 'root2';
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT,UPDATE,INSERT ON AUTHORS.AUTHOR TO John;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT,UPDATE,INSERT,DELETE ON AUTHORS.AUTHOR TO Jane;
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT ON AUTHORS.AUTHOR TO Sally;
Query OK, 0 rows affected (0.00 sec)

mysql> SHOW GRANTS FOR John;
+-----+
| Grants for John@% |
+-----+
```

```
TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT

mysql> GRANT SELECT ON AUTHORS.AUTHOR TO Sally;
Query OK, 0 rows affected (0.00 sec)

mysql> SHOW GRANTS FOR John;
+-----+
| Grants for John@% |
+-----+
| GRANT USAGE ON *.* TO 'John'@'%'
| GRANT SELECT, INSERT, UPDATE ON `AUTHORS`.`AUTHOR` TO 'John'@'%'
+-----+
2 rows in set (0.00 sec)

mysql> SHOW GRANTS FOR Jane;
+-----+
| Grants for Jane@% |
+-----+
```

```
TERMINAL ⌂ SEARCH RESOURCE MONITOR LINT

+-----+
| GRANT USAGE ON *.* TO 'Jane'@'%'
| GRANT SELECT, INSERT, UPDATE, DELETE ON `AUTHORS`.`AUTHOR` TO 'Jane'@'%'
+-----+
2 rows in set (0.00 sec)

mysql> SHOW GRANTS FOR Sally;
+-----+
| Grants for Sally@% |
+-----+
| GRANT USAGE ON *.* TO 'Sally'@'%'
| GRANT SELECT ON `AUTHORS`.`AUTHOR` TO 'Sally'@'%'
+-----+
2 rows in set (0.00 sec)

mysql> █
```

10. Using Access level control, set up row and column level security on the Employee table, Clerks can only edit phone number and add new rows, but managers can perform all the DML operations in SQL Server

```
TERMINAL 🔍 SEARCH RESOURCE MONITOR LINT
Copyright (c) 2000, 2021, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> CREATE DATABASE EMPLOYEES;
Query OK, 1 row affected (0.03 sec)

mysql> use EMPLOYEES;
Database changed
mysql> CREATE TABLE EMPLOYEE(EMPNO INT(4),EMPFNAME VARCHAR(25),EMPLNAME VARCHAR(25),DESIGNATION VARCHAR(25),SALARY INT(6));
Query OK, 0 rows affected (0.33 sec)
```

```
TERMINAL 🔍 SEARCH RESOURCE MONITOR LINT
mysql> CREATE USER 'CLERK' IDENTIFIED BY 'clerk1';
Query OK, 0 rows affected (0.07 sec)

mysql> CREATE USER 'MANAGER' IDENTIFIED BY 'man1';
mysql> SHOW GRANTS TO CLERK;
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 'K' at line 1
mysql> SHOW GRANTS FOR CLERK;
+-----+
| Grants for CLERK@%                                |
+-----+
| GRANT USAGE ON *.* TO 'CLERK'@'%'
| GRANT ALTER ON `EMPLOYEES`.`EMPLOYEE` TO 'CLERK'@'%'
+-----+
2 rows in set (0.00 sec)
```

```
TERMINAL 🔍 SEARCH RESOURCE MONITOR LINT
+-----+
| Grants for CLERK@%                                |
+-----+
| GRANT USAGE ON *.* TO 'CLERK'@'%'
| GRANT ALTER ON `EMPLOYEES`.`EMPLOYEE` TO 'CLERK'@'%'
+-----+
2 rows in set (0.00 sec)

mysql> GRANT UPDATE(EMPPNO) ON EMPLOYEES.EMPLOYEE TO CLERK;
Query OK, 0 rows affected (0.06 sec)

mysql> GRANT SELECT,INSERT,UPDATE,DELETE ON EMPLOYEES.EMPLOYEE TO MANAGER;
Query OK, 0 rows affected (0.00 sec)

mysql> SHOW GRANTS FOR CLERK;
+-----+
```

```
TERMINAL 🔍 SEARCH RESOURCE MONITOR LINT

Query OK, 0 rows affected (0.00 sec)

mysql> SHOW GRANTS FOR CLERK;
+-----+
| Grants for CLERK@% |
+-----+
| GRANT USAGE ON *.* TO 'CLERK'@'%' |
| GRANT UPDATE (EMPPNO), ALTER ON `EMPLOYEES`.`EMPLOYEE` TO 'CLERK'@'%' |
+-----+
2 rows in set (0.00 sec)

mysql> SHOW GRANTS FOR MANAGER;
+-----+
| Grants for MANAGER@% |
+-----+
| GRANT USAGE ON *.* TO 'MANAGER'@'%' |
+-----+
2 rows in set (0.00 sec)
```

```
TERMINAL 🔍 SEARCH RESOURCE MONITOR LINT

+-----+
2 rows in set (0.00 sec)

mysql> SHOW GRANTS FOR MANAGER;
+-----+
| Grants for MANAGER@% |
+-----+
| GRANT USAGE ON *.* TO 'MANAGER'@'%' |
| GRANT SELECT, INSERT, UPDATE, DELETE ON `EMPLOYEES`.`EMPLOYEE` TO 'MANAGER'@'%' |
+-----+
2 rows in set (0.00 sec)

mysql> REVOKE ALTER GRANT OPTION FROM CLERK;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL
PTION FROM CLERK' at line 1
mysql> REVOKE ALTER ON EMPLOYEES.EMPLOYEE FROM CLERK;
```

```
TERMINAL 🔍 SEARCH RESOURCE MONITOR LINT

Query OK, 0 rows affected (0.00 sec)

mysql> SHOW GRANTS FOR CLERK;
+-----+
| Grants for CLERK@% |
+-----+
| GRANT USAGE ON *.* TO 'CLERK'@'%' |
| GRANT UPDATE (EMPPNO) ON `EMPLOYEES`.`EMPLOYEE` TO 'CLERK'@'%' |
+-----+
2 rows in set (0.00 sec)

mysql> GRANT INSERT ON EMPLOYEES.EMPLOYEE TO CLERK;
Query OK, 0 rows affected (0.00 sec)

mysql> SHOW GRANTS FOR CLERK;
+-----+
```

```
TERMINAL 🔍 SEARCH RESOURCE MONITOR LINT
+-----+
2 rows in set (0.00 sec)

mysql> GRANT INSERT ON EMPLOYEES.EMPLOYEE TO CLERK;
Query OK, 0 rows affected (0.00 sec)

mysql> SHOW GRANTS FOR CLERK;
+-----+
| Grants for CLERK@% |
+-----+
| GRANT USAGE ON *.* TO 'CLERK'@'%' |
| GRANT INSERT, UPDATE (EMPPNO) ON `EMPLOYEES`.`EMPLOYEE` TO 'CLERK'@'%' |
+-----+
2 rows in set (0.00 sec)

mysql> █
```

INTERNAL EXAMINER I

INTERNAL EXAMINER II