



CONESTOGA

Connect Life and Learning

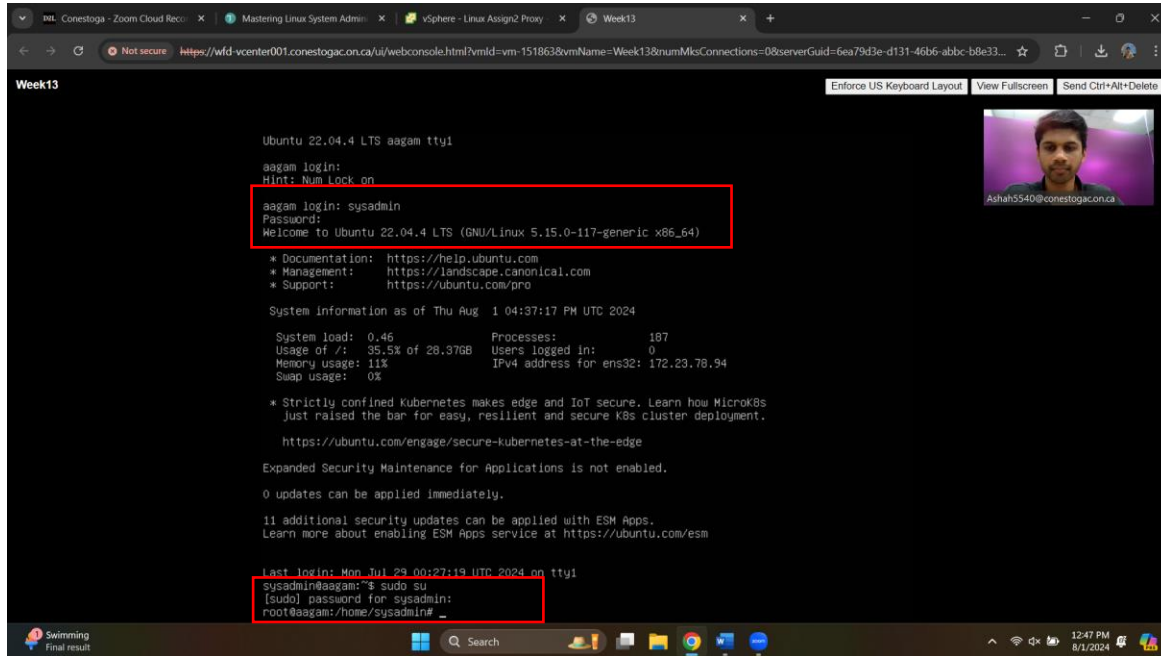
Student Name:	Aagam Sanjay Shah
Deliverable:	In-Class Tasks Week 13 Assignment
Course Name:	NTWK8141-24S-Sec3-Linux Server

Date Assigned:	31/07/2024
Date Due:	01/08/2024
Rules:	<ul style="list-style-type: none">• Individual.• Cheating is not allowed.• Plagiarism counts as cheating!• That FAILURE to submit work in the course can result in a grade of 'F' or 'I' for failure to complete the course!

Week 13 Slide 21

Complete the Real World Scenario: Testing Your Web Server from the Command Line in Ch 20 TESTING YOUR WEB SERVER FROM THE COMMAND LINE

1. Log in as root or acquire root privileges by using su or sudo with each of the following commands.



```
Week13

Ubuntu 22.04.4 LTS aagam tty1
aagam login:
Hint: Num Lock on
aagam login: sysadmin
Password:
Welcome to Ubuntu 22.04.4 LTS (GNU/Linux 5.15.0-117-generic x86_64)

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

System information as of Thu Aug 1 04:37:17 PM UTC 2024

System load: 0.46               Processes: 187
Usage of /: 35.5% of 28.37GB     Users logged in: 0
Memory usage: 11%              IPv4 address for ens32: 172.23.78.94
Swap usage: 0%

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.
   https://ubuntu.com/engage/secure-kubernetes-at-the-edge

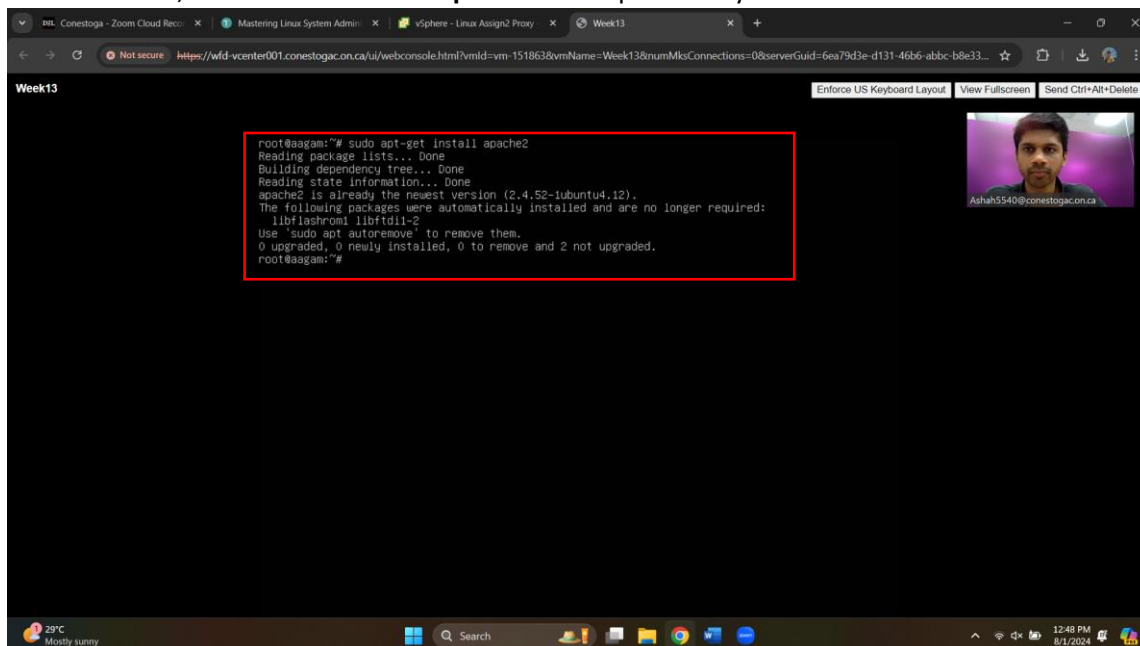
Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

11 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm

Last login: Mon Jul 29 00:27:19 UTC 2024 on tty1
sysadmin@aagam:~$ sudo su
(sudo) password for sysadmin:
root@aagam:/home/sysadmin#
```

2. Ensure that you have the Apache web server installed. Open a command prompt and then type **sudo apt-get install apache2** to install the Apache web server package on your Ubuntu server, or **sudo dnf install httpd** to install Apache on your Red Hat server.

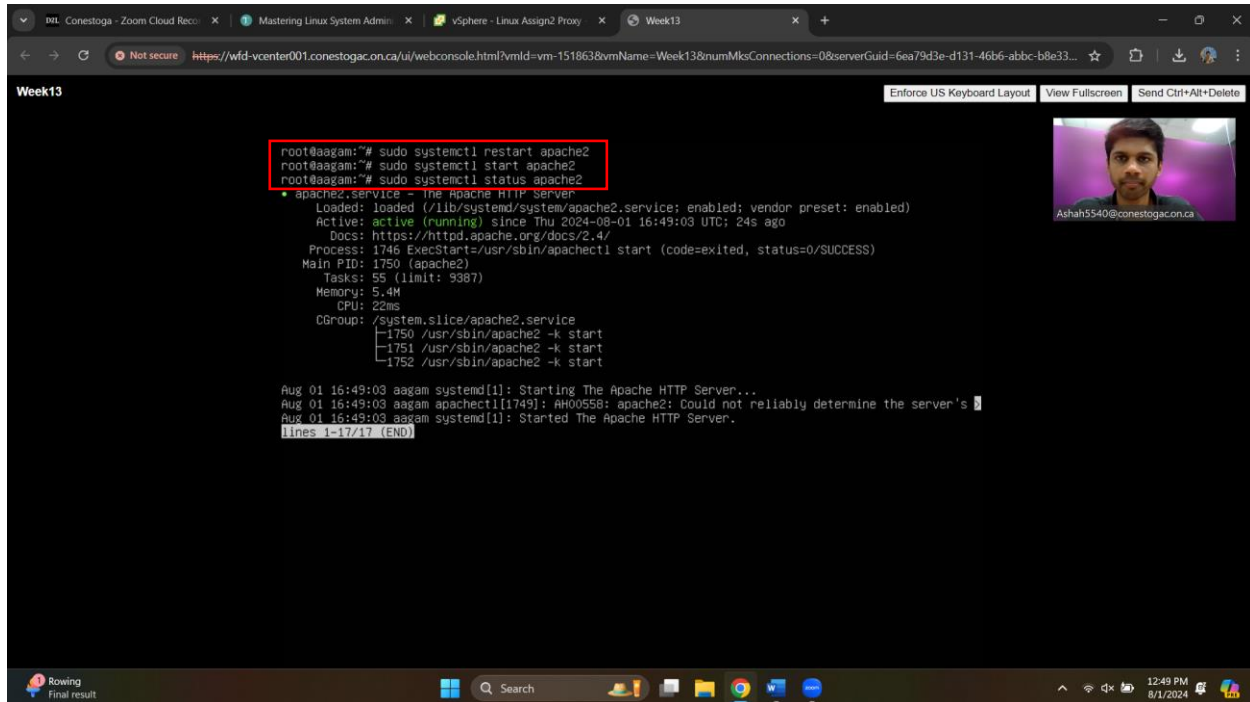


```
Week13

root@aagam:~# sudo apt-get install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
apache2 is already the newest version (2.4.52-1ubuntu4.12).
The following packages were automatically installed and are no longer required:
  libflashrom1 libftdi1-2
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 2 not upgraded.
root@aagam:~#
```

- For Red Hat servers, start the Apache web server by typing **sudo systemctl start httpd**.

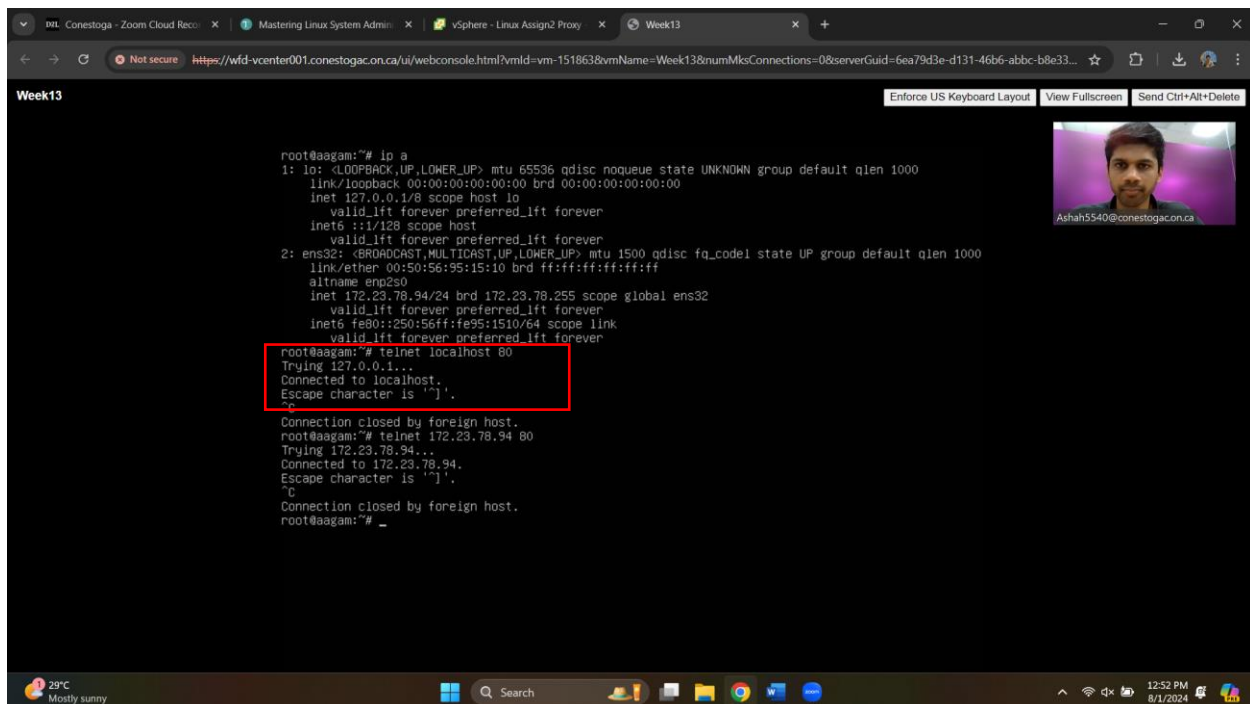
Ubuntu: Apache2 status



```
root@aagam:~# sudo systemctl restart apache2
root@aagam:~# sudo systemctl start apache2
root@aagam:~# sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2024-08-01 16:49:03 UTC; 24s ago
     Docs: https://httpd.apache.org/docs/2.4/
   Process: 1746 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
    Main PID: 1750 (apache2)
      Tasks: 55 (limit: 9387)
     Memory: 5.4M
        CPU: 22ms
    CGroup: /system.slice/apache2.service
            └─1750 /usr/sbin/apache2 -k start
              └─1751 /usr/sbin/apache2 -k start
                └─1752 /usr/sbin/apache2 -k start

Aug 01 16:49:03 aagam systemd[1]: Starting The Apache HTTP Server...
Aug 01 16:49:03 aagam apachectl[1749]: AH00558: apache2: Could not reliably determine the server's
Aug 01 16:49:03 aagam systemd[1]: Started The Apache HTTP Server.
lines 1-17/17 (END)
```

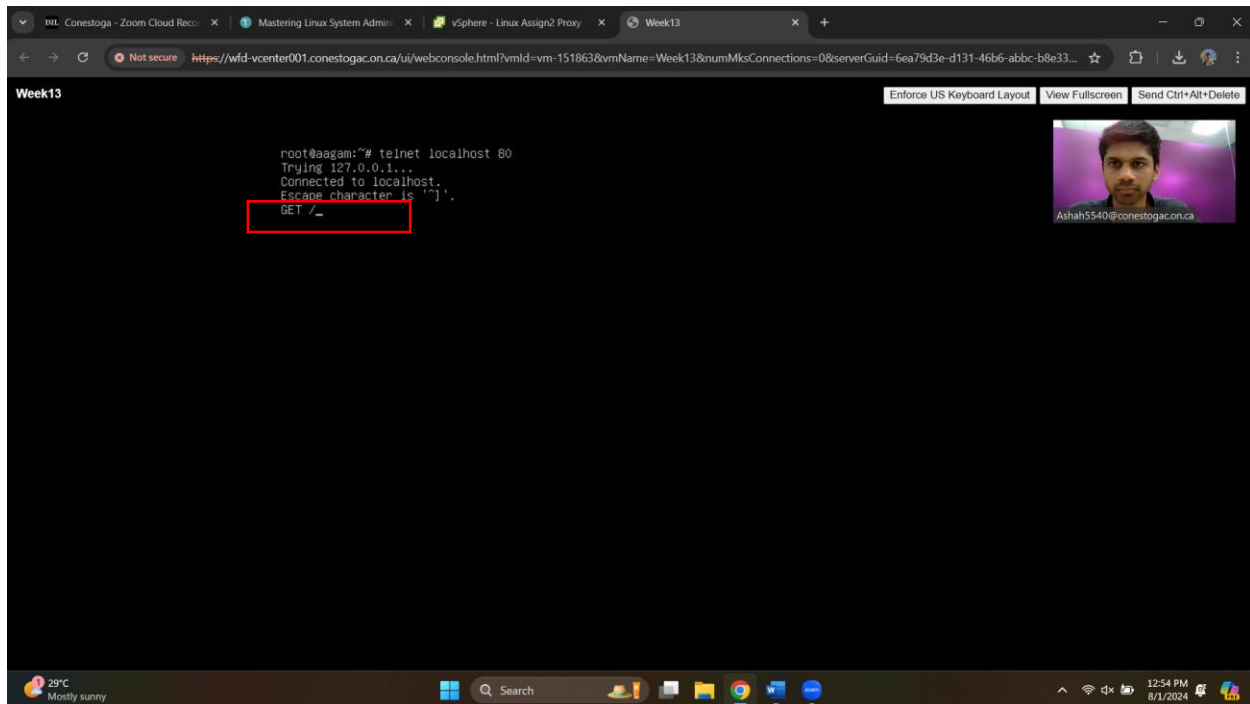
- Test the Apache web server by typing **telnet localhost 80** at a command line (you may have to also install the Telnet package on your system). If your system has the Apache web server running, you should be greeted by the Telnet banner, but nothing from the Apache web server as it's waiting for your request.



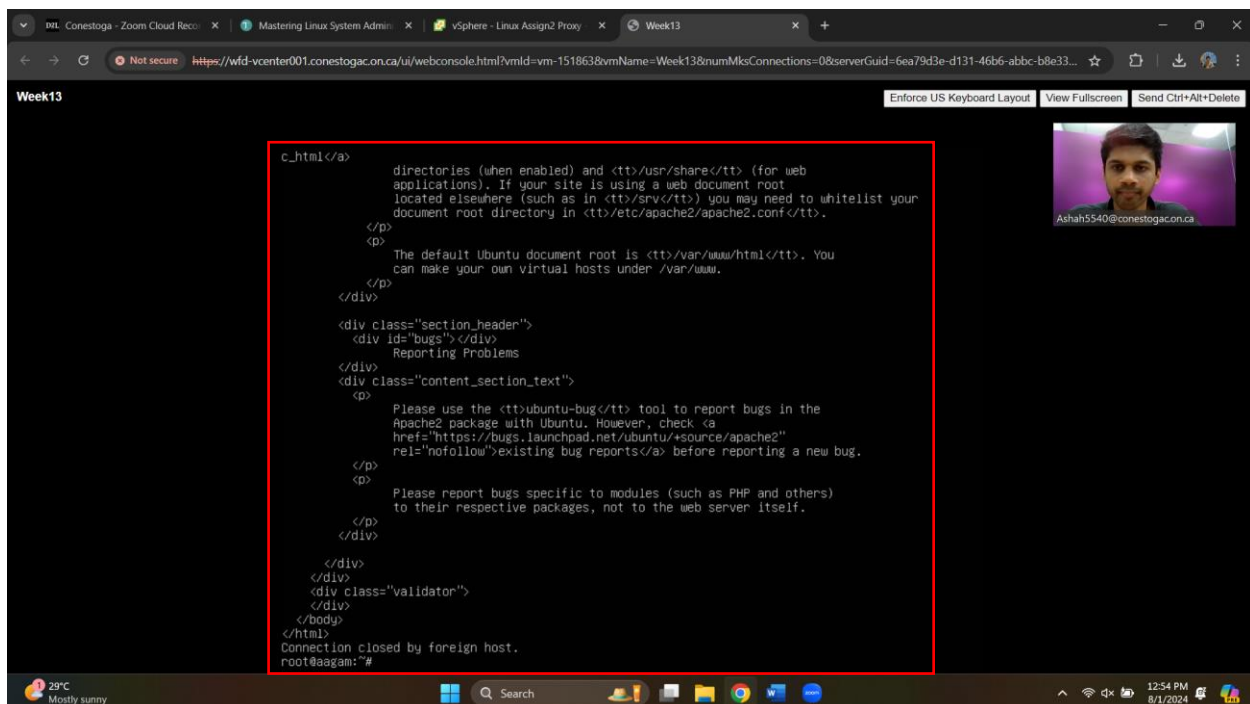
```
root@aagam:~# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: ens32: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 00:50:56:95:15:10 brd ff:ff:ff:ff:ff:ff
    altname enp2s0
    inet 172.23.78.94/24 brd 172.23.78.255 scope global ens32
        valid_lft forever preferred_lft forever
    inet6 fe80::250:56ff:fe95:1510/64 scope link
        valid_lft forever preferred_lft forever

root@aagam:~# telnet localhost 80
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^['.
^C
Connection closed by foreign host.
root@aagam:~# telnet 172.23.78.94 80
Trying 172.23.78.94...
Connected to 172.23.78.94.
Escape character is '^['.
^C
Connection closed by foreign host.
root@aagam:~#
```

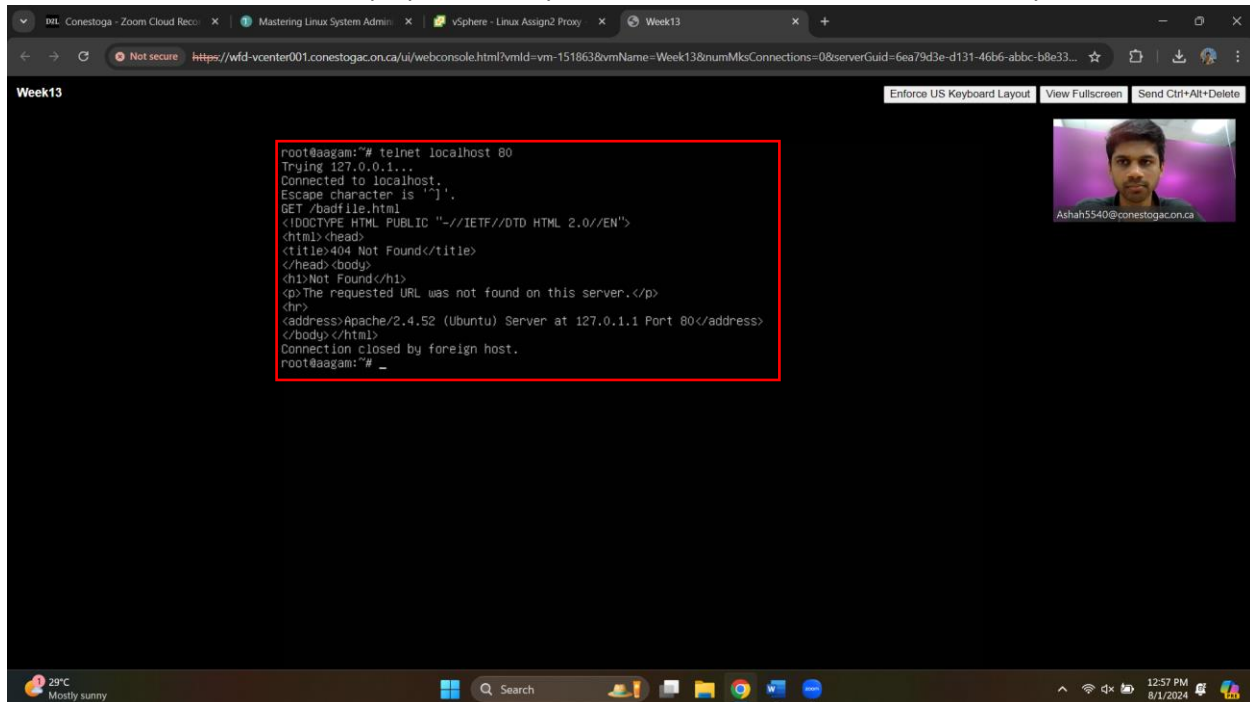
- Request the default web page from the server by typing **GET /**, and then hit the Enter key to submit the request.



- The Apache web server should return the HTML code contained in the index.html file from the /var/www/html directory.



7. Now test attempting to retrieve an invalid web page. Connect to the Apache web server by typing **telnet localhost 80** at a command line. At the prompt, type **GET /badfile.html** and then hit the Enter key. You should see some HTML code for a generic error message web page that the browser would display to inform you that it could not find the file on the system.

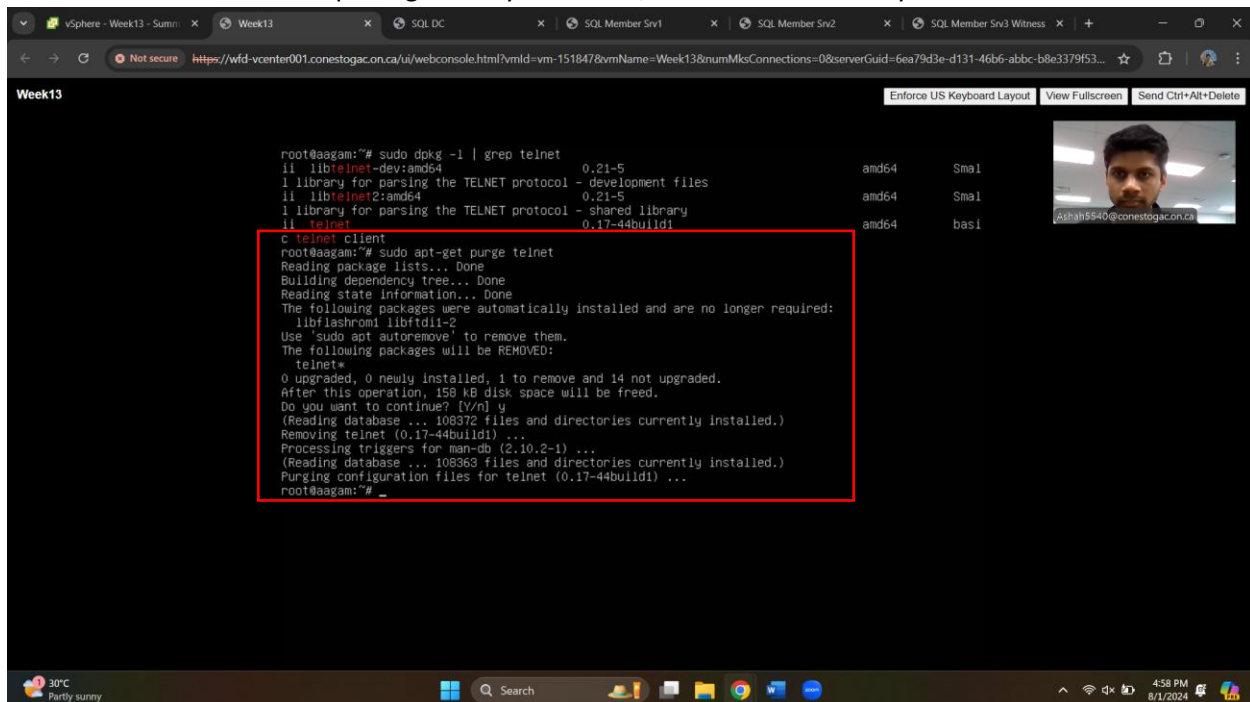


The screenshot shows a web console interface for a VM named 'Week13'. The terminal output is as follows:

```
root@aagam:~# telnet localhost 80
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
GET /badfile.html
<DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
<html><head>
<title>404 Not Found</title>
</head><body>
<h1>Not Found</h1>
<p>The requested URL was not found on this server.</p>
<hr>
<address>Apache/2.4.52 (Ubuntu) Server at 127.0.1.1 Port 80</address>
</body></html>
Connection closed by foreign host.
root@aagam:~#
```

The terminal output is highlighted with a red box. A video feed of a person is visible in the top right corner of the console window.

8. Remove the Telnet package from your server, as it can be a security risk if left enabled.



The screenshot shows a web console interface for a VM named 'Week13'. The terminal output is as follows:

```
root@aagam:~# sudo dpkg --get-architecture
amd64
root@aagam:~# dpkg-query -f='${Package} ${Version} ${Architecture}\n' -W libtelnet-dev:amd64
libtelnet-dev:amd64 0.21-5 amd64
1 library for parsing the TELNET protocol - development files
root@aagam:~# dpkg-query -f='${Package} ${Version} ${Architecture}\n' -W libtelnet2:amd64
libtelnet2:amd64 0.21-5 amd64
1 library for parsing the TELNET protocol - shared library
root@aagam:~# dpkg-query -f='${Package} ${Version} ${Architecture}\n' -W telnet
telnet 0.17-44build1 amd64
c telnet client
root@aagam:~# sudo apt-get purge telnet
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
libflashrom1 libftdi1-2
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
telnet*
0 upgraded, 0 newly installed, 1 to remove and 14 not upgraded.
After this operation, 158 kB disk space will be freed.
Do you want to continue? [Y/n] y
(Reading database ... 108372 files and directories currently installed.)
Removing telnet (0.17-44build1) ...
Processing triggers for man-db (2.10.2-1) ...
(Reading database ... 108363 files and directories currently installed.)
Purging configuration files for telnet (0.17-44build1) ...
root@aagam:~#
```

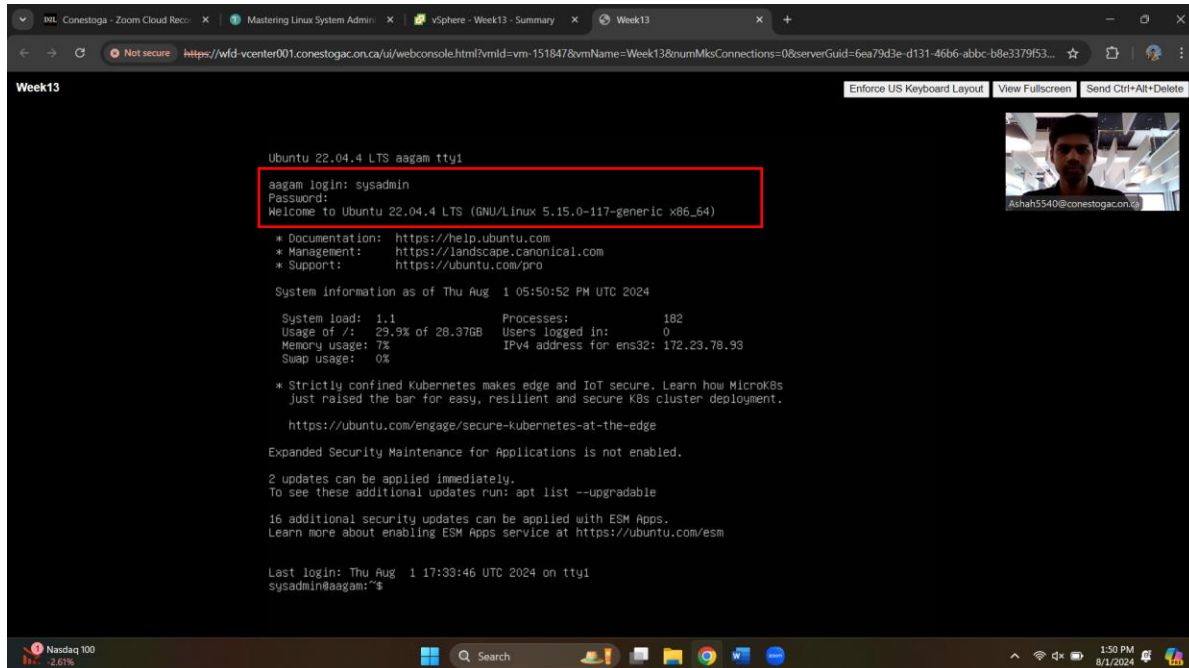
The terminal output is highlighted with a red box. A video feed of a person is visible in the top right corner of the console window.

Week 13 Slide 34

Complete the Real World Scenario: Installing the MariaDB Server on Your Ubuntu System in Ch 21

INSTALLING THE MARIADB SERVER ON YOUR UBUNTU SYSTEM

1. Log into your Ubuntu Linux system, using the sysadmin account and the password you created for it.



```
Week13

Ubuntu 22.04.4 LTS aagam tty1
aagam login: sysadmin
Password:
Welcome to Ubuntu 22.04.4 LTS (GNU/Linux 5.15.0-117-generic x86_64)

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

System information as of Thu Aug 1 05:50:52 PM UTC 2024

System load: 1.1          Processes: 182
Usage of /: 29.9% of 28.37GB    Users logged in: 0
Memory usage: 7%          IPv4 address for ens32: 172.23.78.93
Swap usage: 0%

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.

https://ubuntu.com/engage/secure-kubernetes-at-the-edge

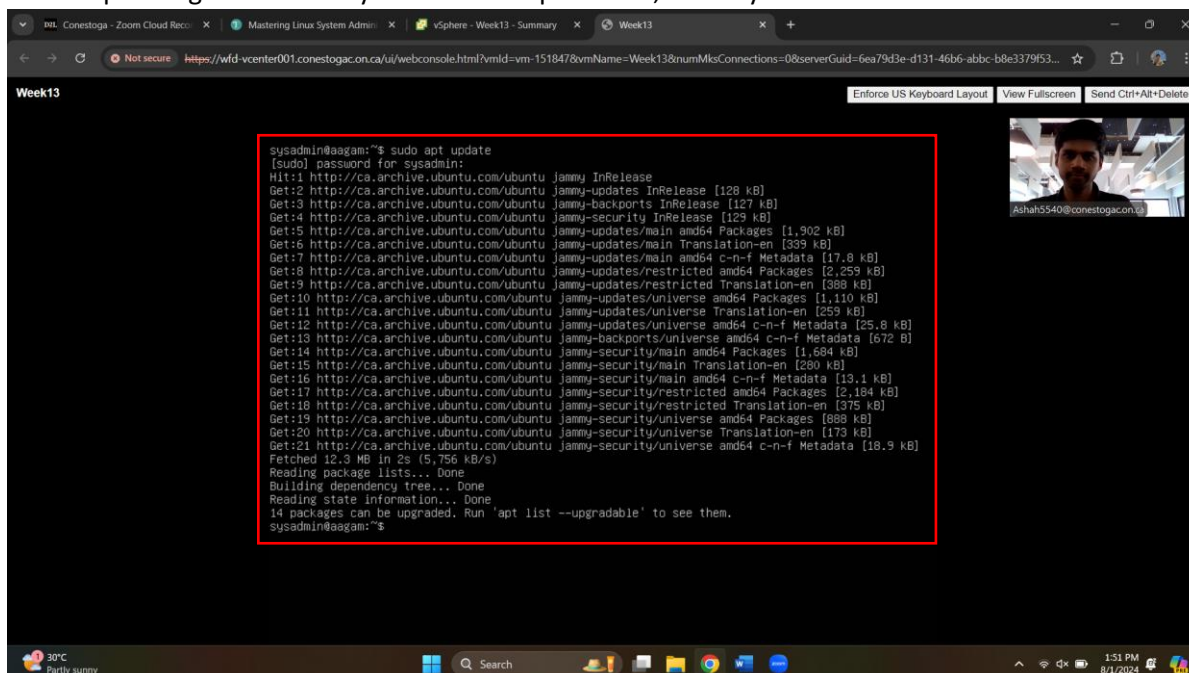
Expanded Security Maintenance for Applications is not enabled.

2 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

16 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm

Last login: Thu Aug 1 17:33:46 UTC 2024 on tty1
sysadmin@aagam:~$
```

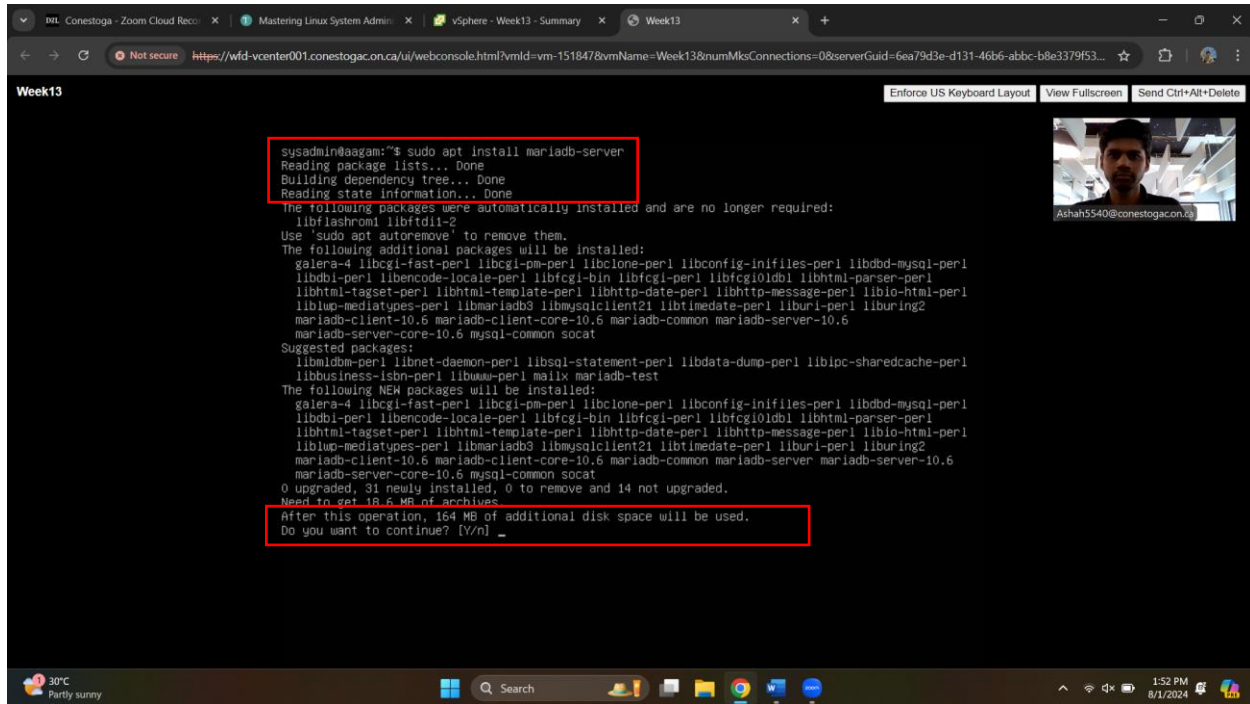
2. Update the package information on your Ubuntu system by typing **sudo apt update** and pressing Enter. Enter your account's password, if the system asks for one.



```
Week13

sysadmin@aagam:~$ sudo apt update
[sudo] password for sysadmin:
Hit:1 http://ca.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://ca.archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Get:3 http://ca.archive.ubuntu.com/ubuntu jammy-backports InRelease [127 kB]
Get:4 http://ca.archive.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Get:5 http://ca.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [1,902 kB]
Get:6 http://ca.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [399 kB]
Get:7 http://ca.archive.ubuntu.com/ubuntu jammy-updates/main amd64 c-n-f Metadata [17.8 kB]
Get:8 http://ca.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [2,259 kB]
Get:9 http://ca.archive.ubuntu.com/ubuntu jammy-updates/restricted Translation-en [388 kB]
Get:10 http://ca.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [1,110 kB]
Get:11 http://ca.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [259 kB]
Get:12 http://ca.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 c-n-f Metadata [25.8 kB]
Get:13 http://ca.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 c-n-f Metadata [672 B]
Get:14 http://ca.archive.ubuntu.com/ubuntu jammy-security/main amd64 Packages [1,684 kB]
Get:15 http://ca.archive.ubuntu.com/ubuntu jammy-security/main Translation-en [280 kB]
Get:16 http://ca.archive.ubuntu.com/ubuntu jammy-security/main amd64 c-n-f Metadata [13.1 kB]
Get:17 http://ca.archive.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [2,184 kB]
Get:18 http://ca.archive.ubuntu.com/ubuntu jammy-security/restricted Translation-en [375 kB]
Get:19 http://ca.archive.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [888 kB]
Get:20 http://ca.archive.ubuntu.com/ubuntu jammy-security/universe Translation-en [173 kB]
Get:21 http://ca.archive.ubuntu.com/ubuntu jammy-security/universe amd64 c-n-f Metadata [18.9 kB]
Fetched 12.3 MB in 2s (5,756 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
14 packages can be upgraded. Run 'apt list --upgradable' to see them.
sysadmin@aagam:~$
```

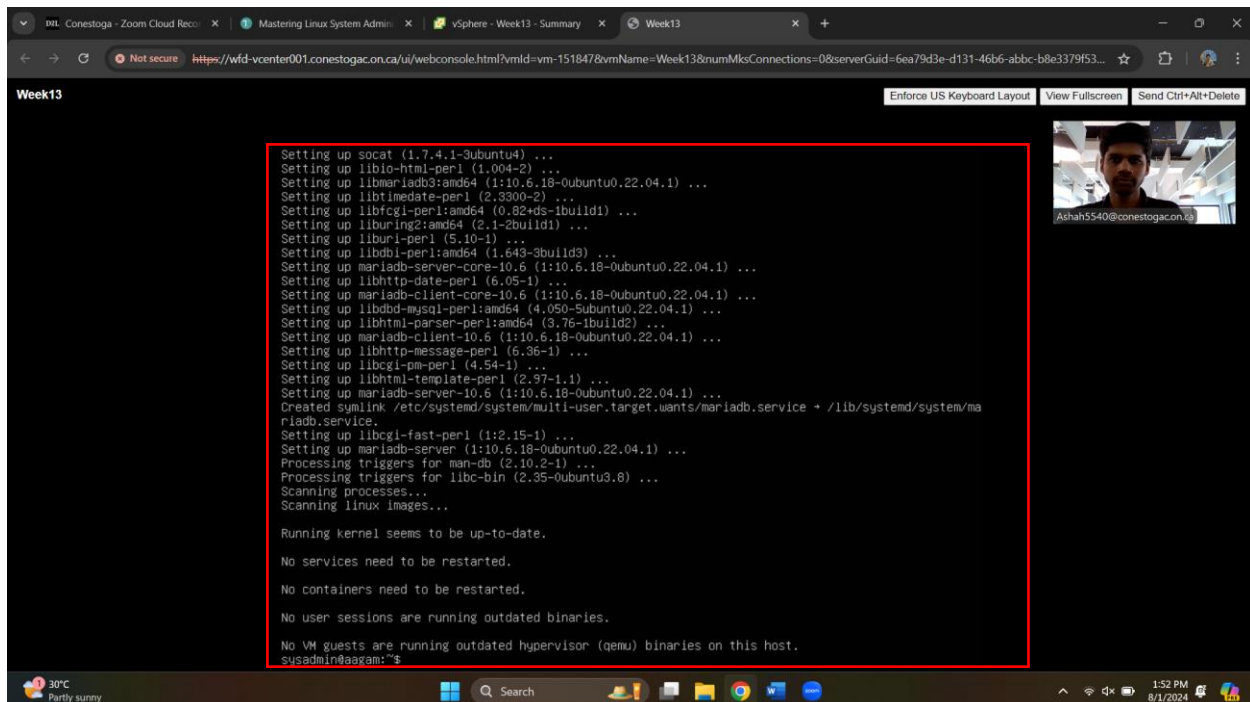

- After you receive the command-line prompt back, install the MariaDB package by typing **sudo apt install mariadb-server** and pressing Enter. Enter your account's password, if the system asks for one.



```
Week13
sysadmin@axam:~$ sudo apt install mariadb-server
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done

The following packages were automatically installed and are no longer required:
  libflashrom1 libftdi1-2
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  galera-4 libbcgi-fast-perl libbcgi-pm-perl libclone-perl libconfig-inifiles-perl libdbd-mysql-perl
  libdbi-perl libencode-locale-perl libfcgi-bin libfcgi-perl libfcgi0ldbl libhtml-parser-perl
  libhtml-tagset-perl libhtml-template-perl libhttp-date-perl libhttp-message-perl libio-html-perl
  liblwp-mediatypes-perl libmariadb3 libmysqlclient21 libtimedate-perl liburi-perl liburing2
  mariadb-client-10.6 mariadb-client-core-10.6 mariadb-common mariadb-server-10.6
  mariadb-server-core-10.6 mysql-common socat
Suggested packages:
  libmldbm-perl libnet-daemon-perl libsql-statement-perl libdata-dump-perl libipc-sharedcache-perl
  libbusiness-isbn-perl libwww-perl mailx mariadb-test
The following NEW packages will be installed:
  galera-4 libbcgi-fast-perl libbcgi-pm-perl libclone-perl libconfig-inifiles-perl libdbd-mysql-perl
  libdbi-perl libencode-locale-perl libfcgi-bin libfcgi-perl libfcgi0ldbl libhtml-parser-perl
  libhtml-tagset-perl libhtml-template-perl libhttp-date-perl libhttp-message-perl libio-html-perl
  liblwp-mediatypes-perl libmariadb3 libmysqlclient21 libtimedate-perl liburi-perl liburing2
  mariadb-client-10.6 mariadb-client-core-10.6 mariadb-common mariadb-server mariadb-server-10.6
  mariadb-server-core-10.6 mysql-common socat
0 upgraded, 31 newly installed, 0 to remove and 14 not upgraded.
Need to get 18.6 MB of archives.
After this operation, 164 MB of additional disk space will be used.
Do you want to continue? [Y/n] _
```

- During the installation process, when you receive the Do you want to continue? [Y/n] prompt, type **Y** and press Enter.



```
Week13
Setting up socat (1.7.4.1-3ubuntu4) ...
Setting up libio-html-perl (1.004-2) ...
Setting up libmariadb3:amd64 (1:10.6.18-0ubuntu0.22.04.1) ...
Setting up libtimedate-perl (2.3000-2) ...
Setting up libfcgi-perl:amd64 (0.82+ds-1build1) ...
Setting up liburing2:amd64 (2.1-2build1) ...
Setting up liburi-perl (5.10-1) ...
Setting up libdbi-perl:amd64 (1.648-3build) ...
Setting up mariadb-server-core-10.6 (1:10.6.18-0ubuntu0.22.04.1) ...
Setting up libhttp-date-perl (6.05-1) ...
Setting up mariadb-client-core-10.6 (1:10.6.18-0ubuntu0.22.04.1) ...
Setting up libdbd-mysql-perl:amd64 (4.050-5ubuntu0.22.04.1) ...
Setting up libhtml-parser-perl:amd64 (3.76-1build2) ...
Setting up mariadb-client-10.6 (1:10.6.18-0ubuntu0.22.04.1) ...
Setting up libhttp-message-perl (6.36-1) ...
Setting up libbcgi-pm-perl (4.54-1) ...
Setting up libhtml-template-perl (2.97-1.1) ...
Setting up mariadb-server-10.6 (1:10.6.18-0ubuntu0.22.04.1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/mariadb.service → /lib/systemd/system/mariadb.service.
Setting up libbcgi-fast-perl (1:2.15-1) ...
Setting up mariadb-server (1:10.6.18-0ubuntu0.22.04.1) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for libc-bin (2.35-0ubuntu3.8) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

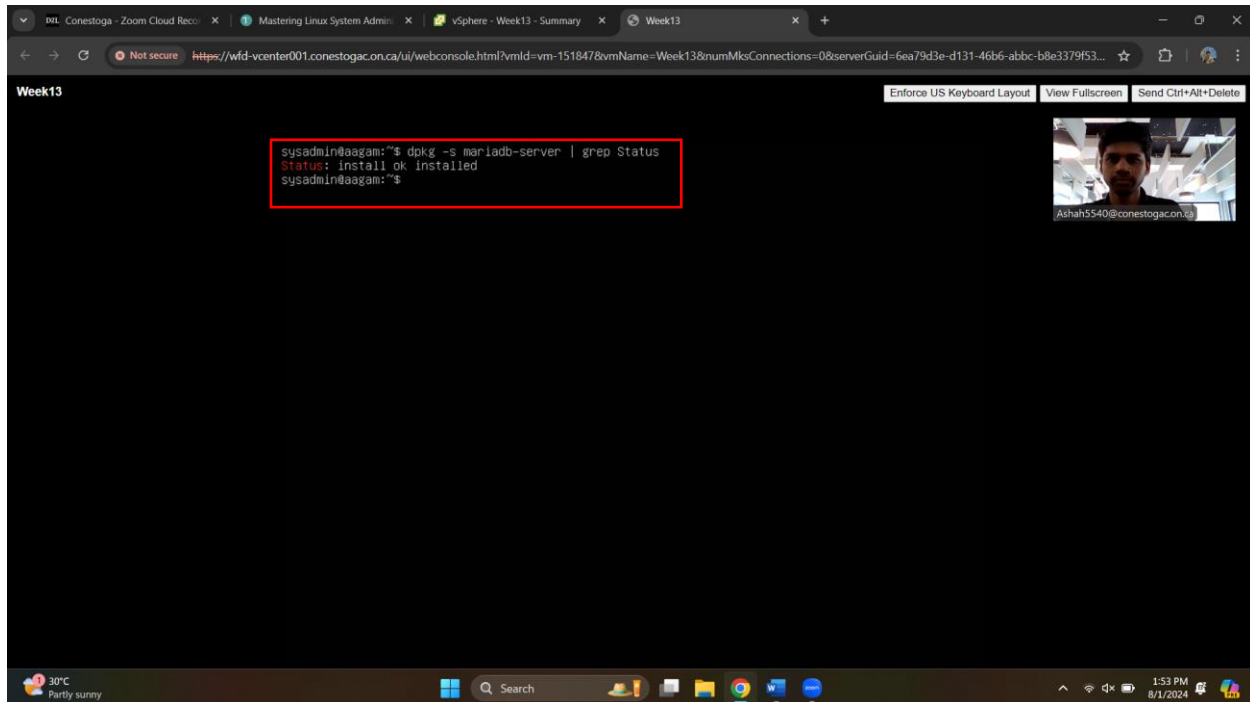
No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
sysadmin@axam:~$
```

5. When you receive the command-line prompt back, check to see if the installation was successful by typing **dpkg -s mariadb-server | grep Status** and pressing Enter. If you receive a message similar to Status: install ok installed, continue on to the next step. If you do not receive this message, troubleshoot the installation. You can get additional help from [Chapter 3](#).

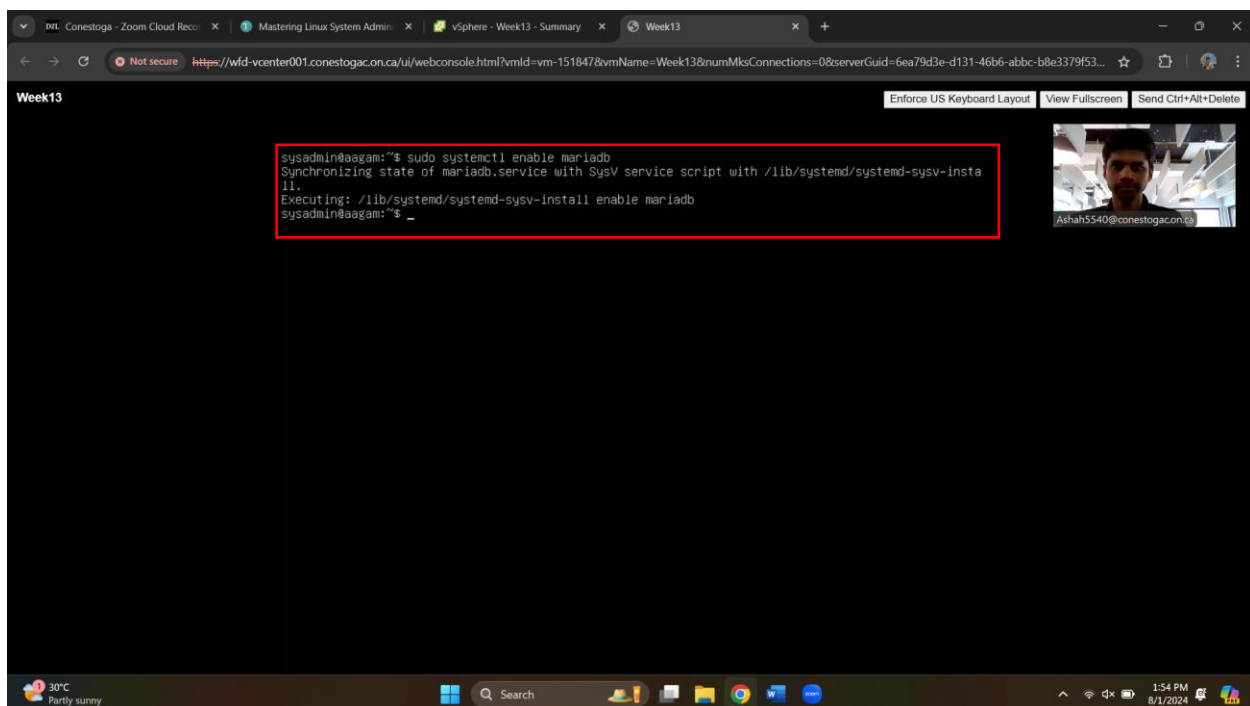


The screenshot shows a terminal window titled 'Week13' with a URL bar indicating a remote session. The terminal output is as follows:

```
sysadmin@aagam:~$ dpkg -s mariadb-server | grep Status
Status: install ok installed
sysadmin@aagam:~$
```

A red box highlights the command and its output. A video feed of a person is visible in the top right corner of the terminal window.

6. Set the MariaDB server to start when the system is booted, by typing **sudo systemctl enable mariadb** and pressing Enter. Enter your account's password, if the system asks for one.

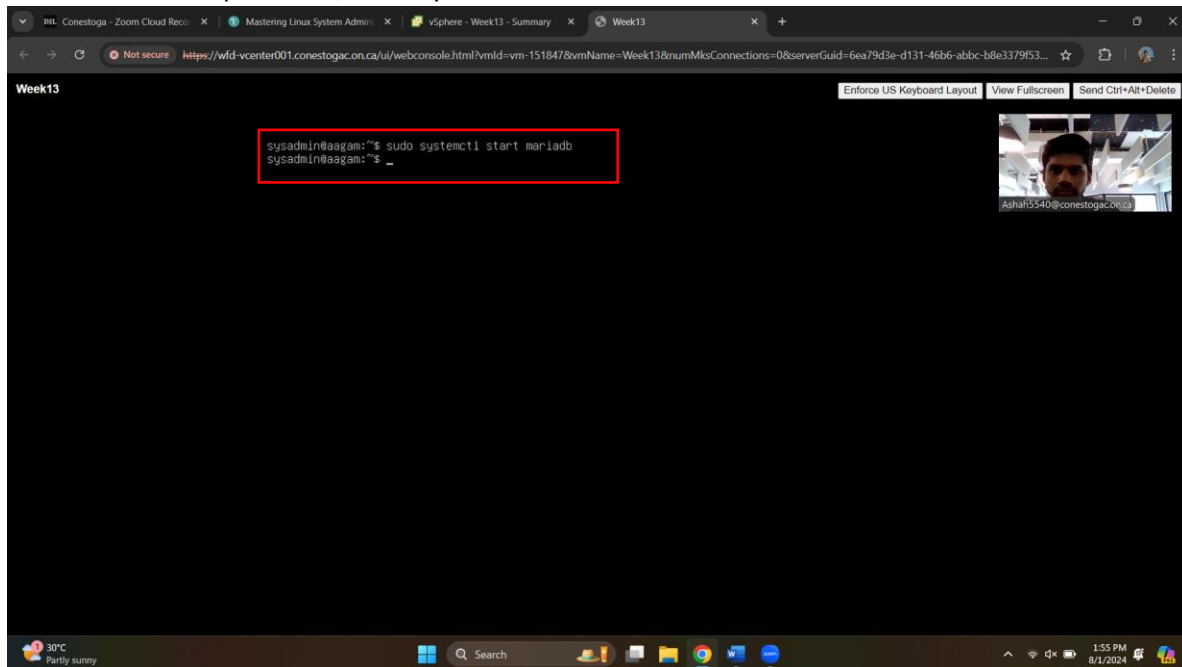


The screenshot shows a terminal window titled 'Week13' with a URL bar indicating a remote session. The terminal output is as follows:

```
sysadmin@aagam:~$ sudo systemctl enable mariadb
Synchronizing state of mariadb.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable mariadb
sysadmin@aagam:~$
```

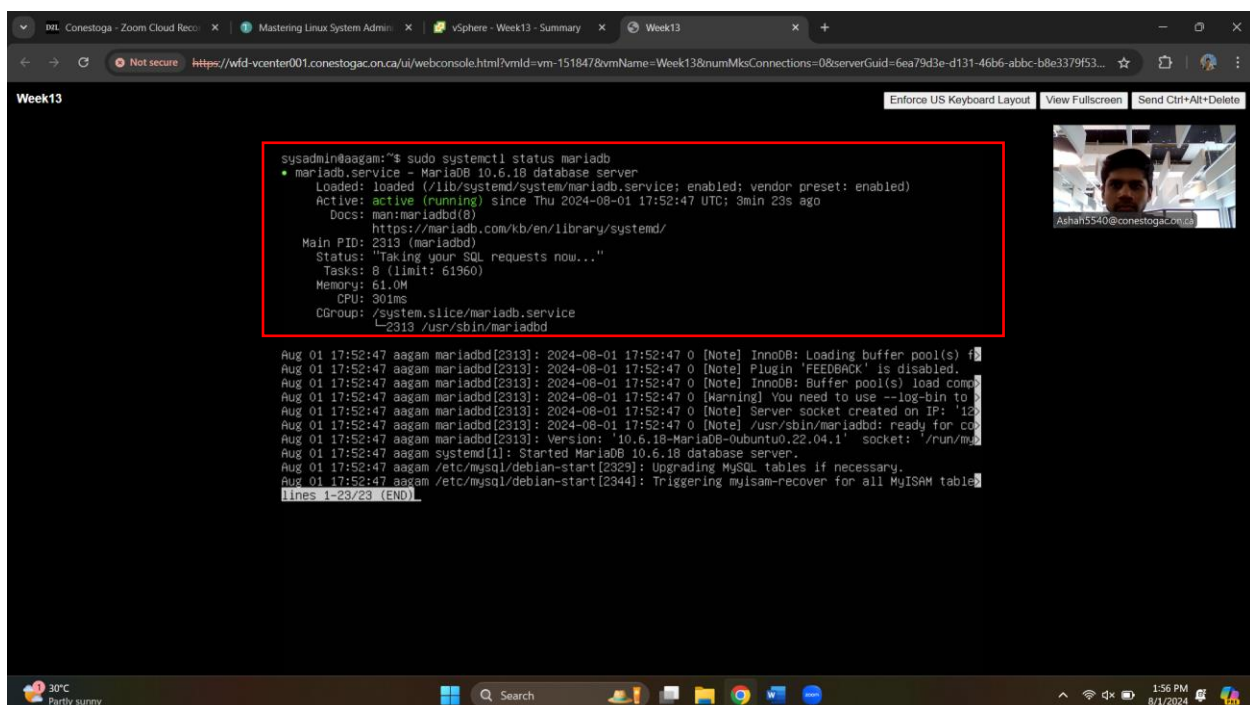
A red box highlights the command and its output. A video feed of a person is visible in the top right corner of the terminal window.

7. Start the MariaDB server by typing **sudo systemctl start mariadb** and pressing Enter. Enter your account's password, if the system asks for one.



```
sysadmin@aagam:~$ sudo systemctl start mariadb
sysadmin@aagam:~$
```

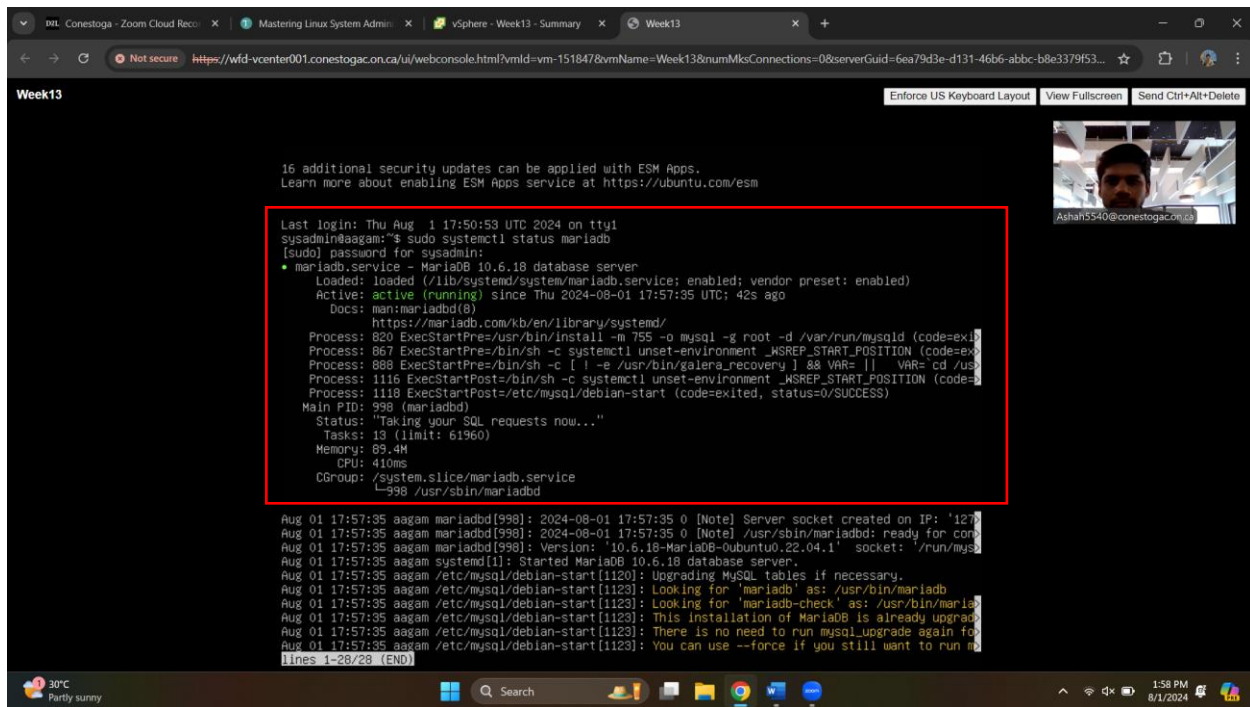
8. Check to ensure that the MariaDB service is enabled (will start at boot) and active (is currently running), by typing **systemctl status mariadb** and pressing Enter. Look through the command's output for the words enabled and active. If you do not see these words, go back to step 6 and reissue the commands in steps 6 and 7, noting any error messages. If you do see these words, congratulations! Your installation of MariaDB on Ubuntu was successful, and the RDBMS is ready to manage your data.



```
sysadmin@aagam:~$ systemctl status mariadb
● mariadb.service - MariaDB 10.6.18 database server
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2024-08-01 17:52:47 UTC; 3min 29s ago
     Docs: man:mariadb(8)
           https://mariadb.com/kb/en/library/systemd/
   Main PID: 2313 (mariadbd)
   Status: "Taking your SQL requests now..."
     Tasks: 0 (limit: 61960)
   Memory: 61.0M
     CPU: 301ms
   CGroup: /system.slice/mariadb.service
           └─2313 /usr/sbin/mariadbd

Aug 01 17:52:47 aagam mariadbd[2313]: 2024-08-01 17:52:47 0 [Note] InnoDB: Loading buffer pool(s) from
Aug 01 17:52:47 aagam mariadbd[2313]: 2024-08-01 17:52:47 0 [Note] Plugin 'FEEDBACK' is disabled.
Aug 01 17:52:47 aagam mariadbd[2313]: 2024-08-01 17:52:47 0 [Note] InnoDB: Buffer pool(s) load completed at
Aug 01 17:52:47 aagam mariadbd[2313]: 2024-08-01 17:52:47 0 [Warning] You need to use --log-bin to log
Aug 01 17:52:47 aagam mariadbd[2313]: 2024-08-01 17:52:47 0 [Note] Server socket created on IP: '127.0.0.1'
Aug 01 17:52:47 aagam mariadbd[2313]: 2024-08-01 17:52:47 0 [Note] /usr/sbin/mariadbd: ready for connections
Aug 01 17:52:47 aagam mariadbd[2313]: Version: '10.6.18-MariaDB-0ubuntu0.22.04.1' socket: '/run/mysqld
Aug 01 17:52:47 aagam systemd[1]: Started MariaDB 10.6.18 database server.
Aug 01 17:52:47 aagam /etc/mysql/debian-start[2329]: Upgrading MySQL tables if necessary.
Aug 01 17:52:47 aagam /etc/mysql/debian-start[2344]: Triggering mysam-recover for all MyISAM tables
lines 1-23/23 (END)
```

After restarting ubuntu server (it its active)



```
16 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm

Last login: Thu Aug 1 17:50:53 UTC 2024 on tty1
sysadmin@aagam:~$ sudo systemctl status mariadb
[sudo] password for sysadmin:
• mariadb.service - MariaDB 10.6.18 database server
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2024-08-01 17:57:35 UTC; 42s ago
     Docs: man:mariadb(8)
           https://mariadb.com/kb/en/library/systemd/
   Process: 820 ExecStartPre=/usr/bin/install -m 755 -o mysql -g root -d /var/run/mysql (code=exited, status=0/SUCCESS)
   Process: 867 ExecStartPre=/bin/sh -c systemctl unset-environment _KSREP_START_POSITION (code=exited, status=0/SUCCESS)
   Process: 888 ExecStartPre=/bin/sh -c [ ! -e /usr/bin/galera_recovery ] && VAR= || VAR= cd /usr && cp -r galera_recovery . && chmod 0700 galera_recovery && cd / && : (code=exited, status=0/SUCCESS)
   Process: 1116 ExecStartPost=/bin/sh -c systemctl unset-environment _KSREP_START_POSITION (code=exited, status=0/SUCCESS)
   Process: 1118 ExecStartPost=/etc/mysql/debian-start (code=exited, status=0/SUCCESS)
   Main PID: 998 (mariadb)
   Status: "Taking your SQL requests now..."
     Tasks: 13 (limit: 61960)
    Memory: 69.4M
       CPU: 410ms
   CGroup: /system.slice/mariadb.service
           └─998 /usr/sbin/mariadb

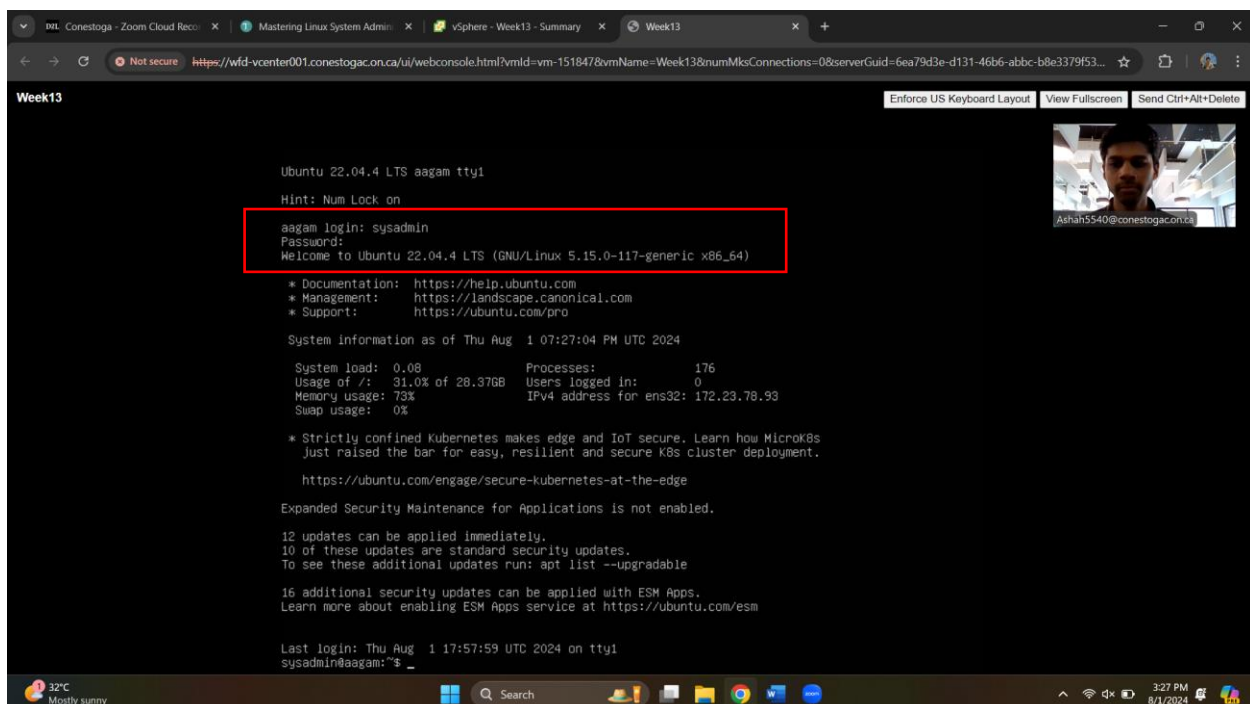
Aug 01 17:57:35 aagam mariadb[998]: 2024-08-01 17:57:35 0 [Note] Server socket created on IP: '127.0.0.1'
Aug 01 17:57:35 aagam mariadb[998]: 2024-08-01 17:57:35 0 [Note] /usr/sbin/mariadb: ready for connections
Aug 01 17:57:35 aagam mariadb[998]: Version: '10.6.18-MariaDB-0ubuntu0.22.04.1' socket: '/run/mysql.sock'
Aug 01 17:57:35 aagam systemd[1]: Started MariaDB 10.6.18 database server.
Aug 01 17:57:35 aagam /etc/mysql/debian-start[1120]: Upgrading MySQL tables if necessary.
Aug 01 17:57:35 aagam /etc/mysql/debian-start[1123]: Looking for 'mariadb' as: /usr/bin/mariadb
Aug 01 17:57:35 aagam /etc/mysql/debian-start[1123]: Looking for 'mariadb-check' as: /usr/bin/mariadb-check
Aug 01 17:57:35 aagam /etc/mysql/debian-start[1123]: This installation of MariaDB is already upgraded
Aug 01 17:57:35 aagam /etc/mysql/debian-start[1123]: There is no need to run mysql_upgrade again for this version
Aug 01 17:57:35 aagam /etc/mysql/debian-start[1123]: You can use --force if you still want to run mysql_upgrade
lines 1-28/28 (END)
```

Week 13 Slide 37

Complete the Real World Scenario: Creating a Database with MariaDB in Ch 21

CREATING A DATABASE WITH MARIADB

1. Log into your Linux system using the sysadmin account and the password you created for it.



```
Ubuntu 22.04.4 LTS aagam tty1
Hint: Num Lock on

aagam login: sysadmin
Password:
Welcome to Ubuntu 22.04.4 LTS (GNU/Linux 5.15.0-117-generic x86_64)

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

System information as of Thu Aug 1 07:27:04 PM UTC 2024

System load: 0.08          Processes: 176
Usage of /: 31.0% of 28.37GB Users logged in: 0
Memory usage: 73%         IPv4 address for ens32: 172.23.78.93
Swap usage: 0%

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.

https://ubuntu.com/engage/secure-kubernetes-at-the-edge

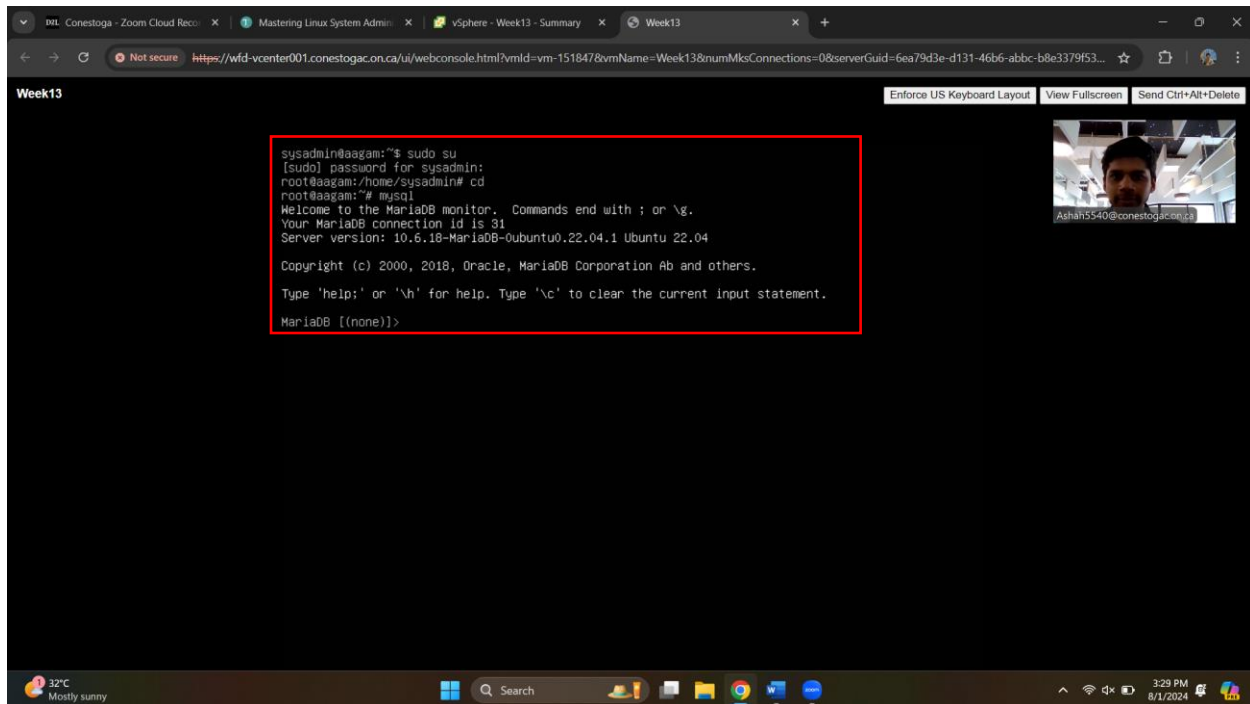
Expanded Security Maintenance for Applications is not enabled.

12 updates can be applied immediately.
10 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

16 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm

Last login: Thu Aug 1 17:57:59 UTC 2024 on tty1
sysadmin@aagam:~$
```

- Using the appropriate privilege escalation method for your Linux distribution, use super user privileges (such as entering **sudo** or logging into the root account), type **mysql**, and press Enter.



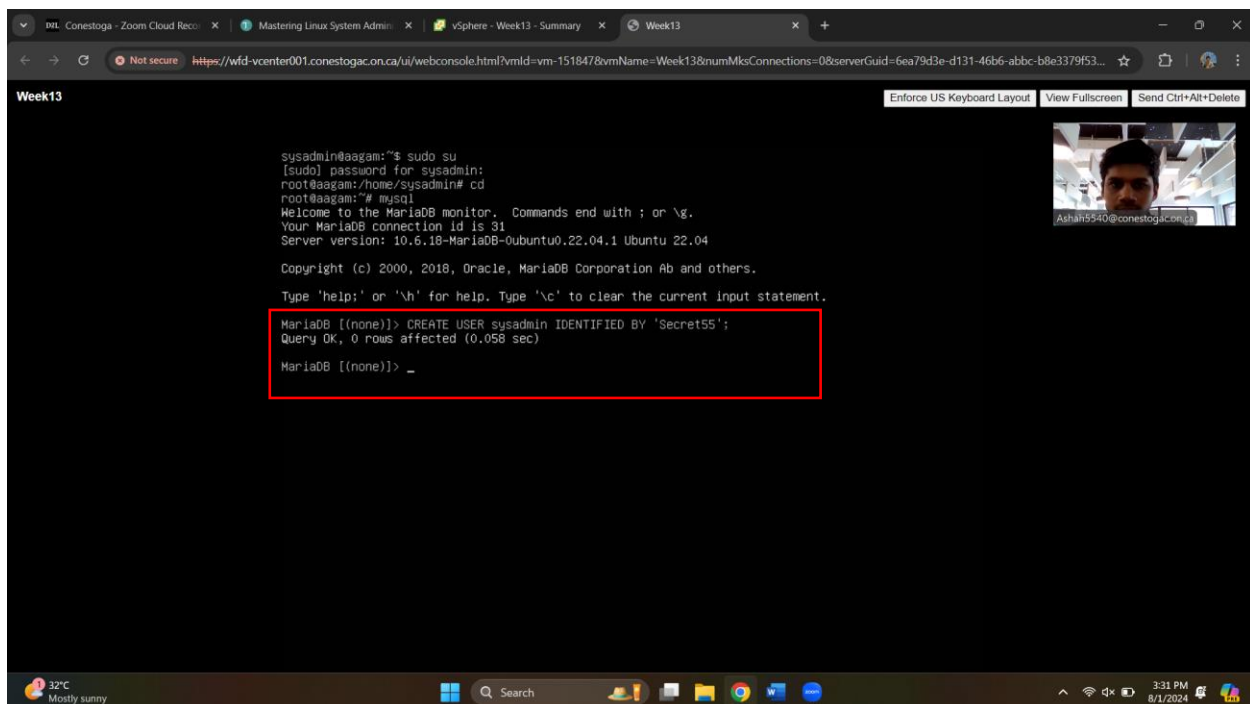
```
sysadmin@aagam:~$ sudo su
[sudo] password for sysadmin:
root@aagam:~# cd
root@aagam:~# mysql
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 31
Server version: 10.6.18-MariaDB-0ubuntu0.22.04.1 Ubuntu 22.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

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

MariaDB [(none)]>
```

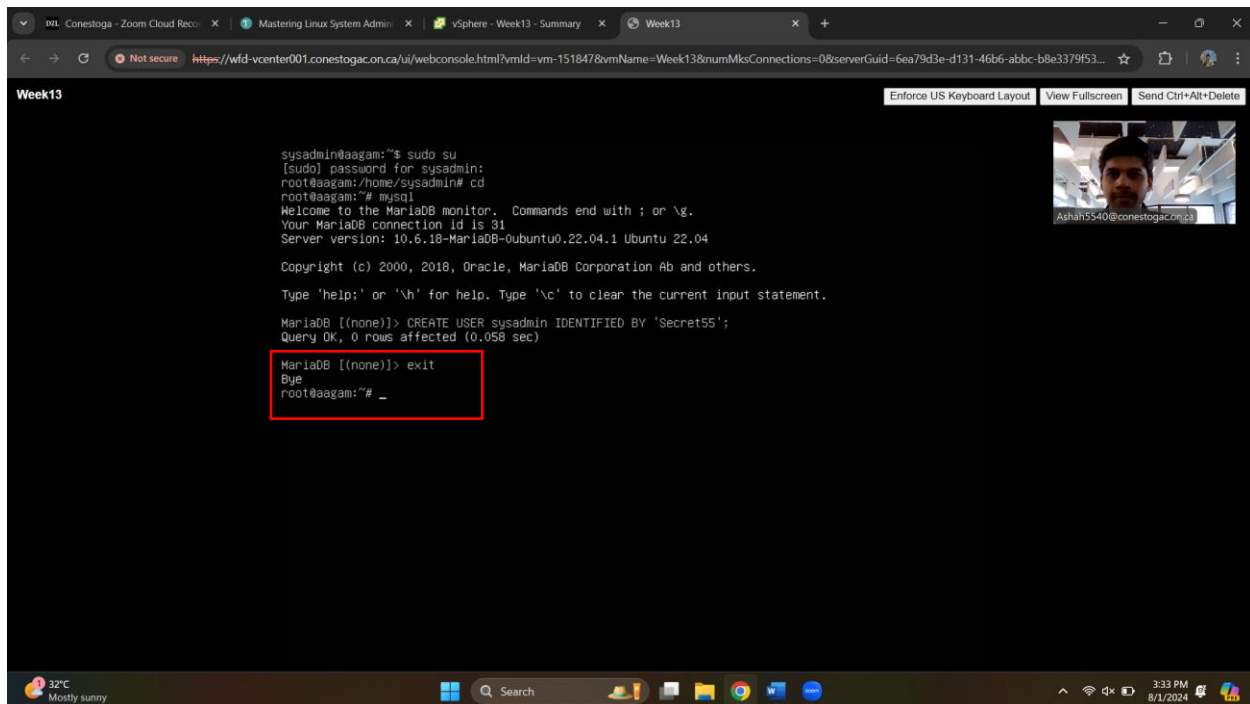
- At the MariaDB SQL interface prompt, type **CREATE USER sysadmin IDENTIFIED BY 'password';**, replacing *password* with the password of your choice, and press Enter.



```
MariaDB [(none)]> CREATE USER sysadmin IDENTIFIED BY 'Secret55';
Query OK, 0 rows affected (0.058 sec)

MariaDB [(none)]> _
```

4. Leave the SQL interface by typing **exit** at the prompt and pressing Enter.



```
sysadmin@aagam:~$ sudo su
[sudo] password for sysadmin:
root@aagam:~# cd
root@aagam:~# mysql
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 31
Server version: 10.6.18-MariaDB-0ubuntu0.22.04.1 Ubuntu 22.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

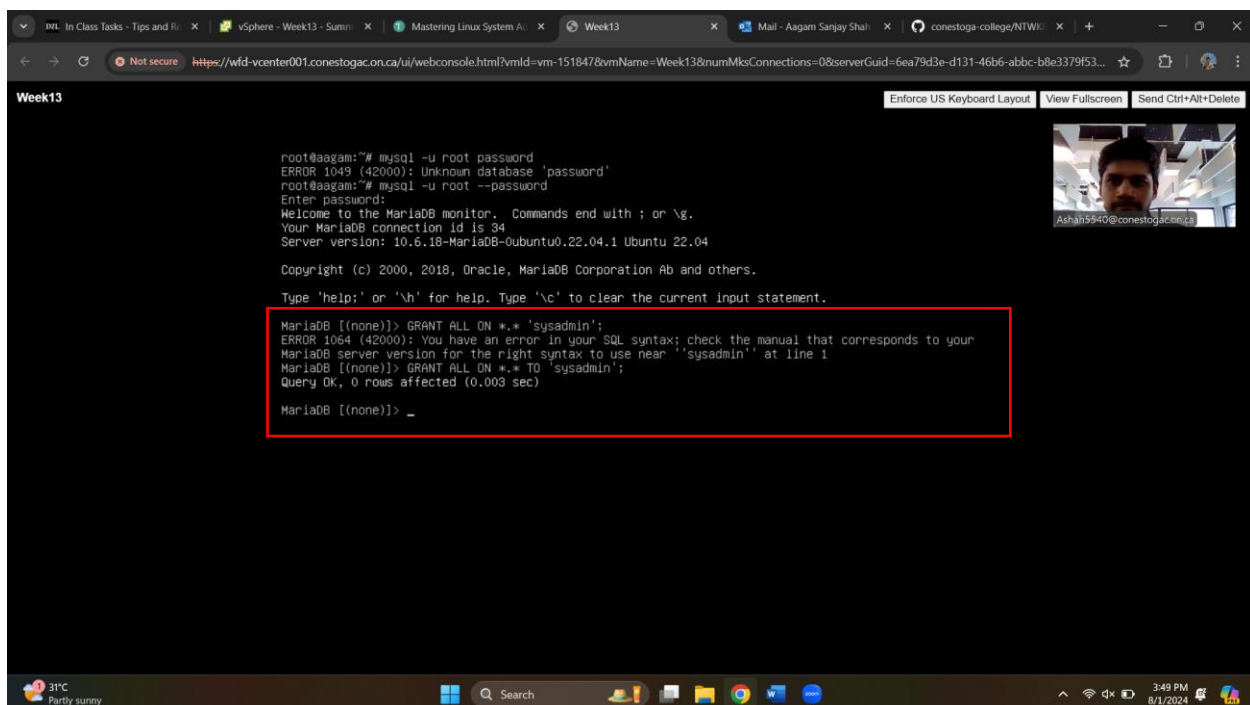
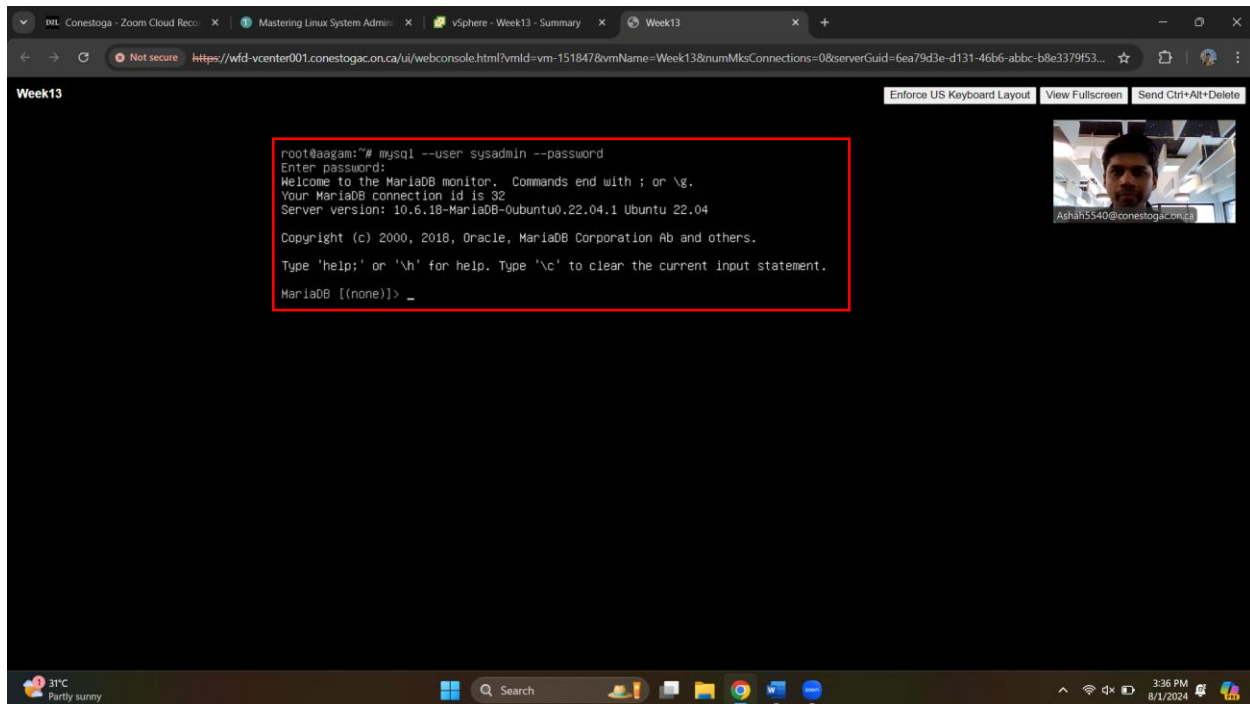
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> CREATE USER sysadmin IDENTIFIED BY 'Secret55';
Query OK, 0 rows affected (0.058 sec)

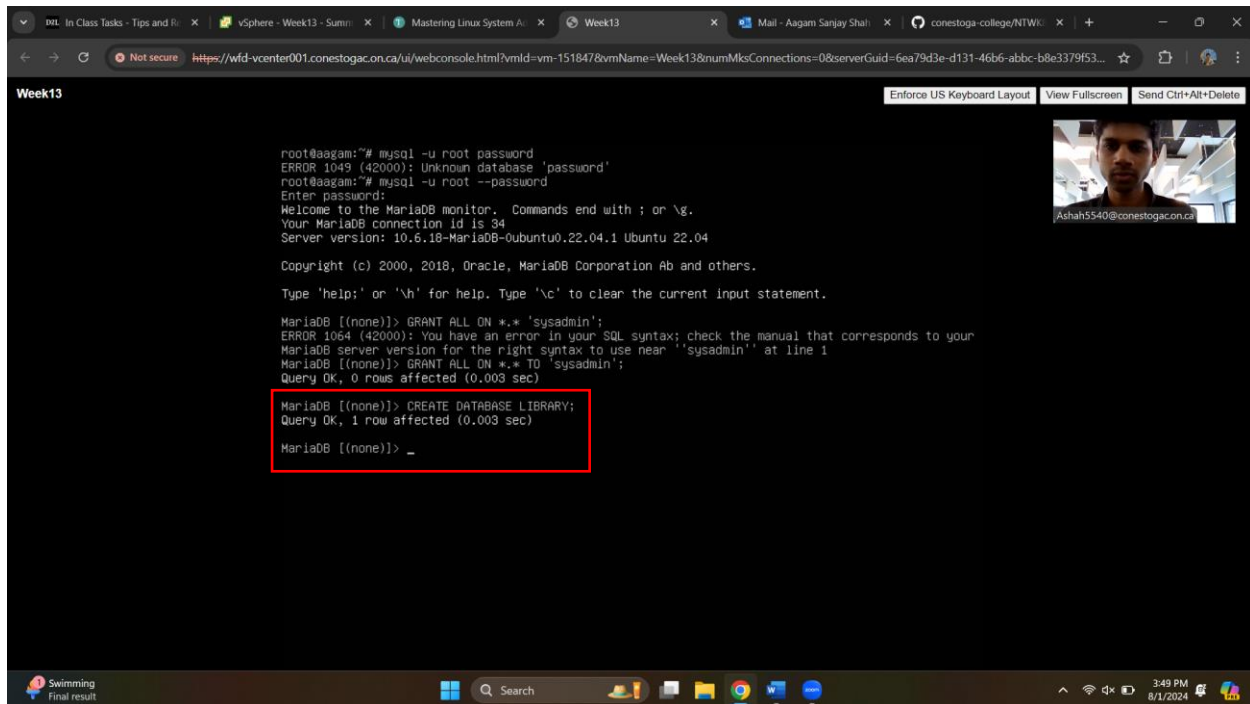
MariaDB [(none)]> exit
Bye
root@aagam:~#
```

5. Pick one of your favorite hobbies to create a database for. Using word processing software or even just a few pieces of paper, list all the data concerning this hobby that you want to track.
➔ Hobbies as (reading)Library, books, singing.
6. Normalize your hobby data by determining the different categories the data should go into.
➔ Different books and variety of songs
7. For your categorized data, determine what tables should be created, what they should be named, and what data fields they will contain. Record this information in your document.
➔ Columns like ID, genre, date, publisher, author.
8. Determine what data field will be the primary key or create one, such as an identification number. This field will exist in every table. Record this information in your document.
➔ ID column is used as primary key
9. Decide the data type for every data field, and record this in your document.
➔ Each column have different data types like text, int and date
10. Choose a name for your hobby database.
➔ Hobby database named as Library

11. Access the MariaDB server's SQL interface by typing **mysql --user sysadmin --password**, and press Enter. When asked for a password, enter the one you created in step 3 for this interface.



12. Create your hobby database by typing **CREATE DATABASE *database-name* ;**, replacing *database-name* with the name of your hobby database, and press Enter.



```
root@aagam:~# mysql -u root password
ERROR 1049 (42000): Unknown database 'password'
root@aagam:~# mysql -u root --password
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 34
Server version: 10.6.18-MariaDB-0ubuntu0.22.04.1 Ubuntu 22.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

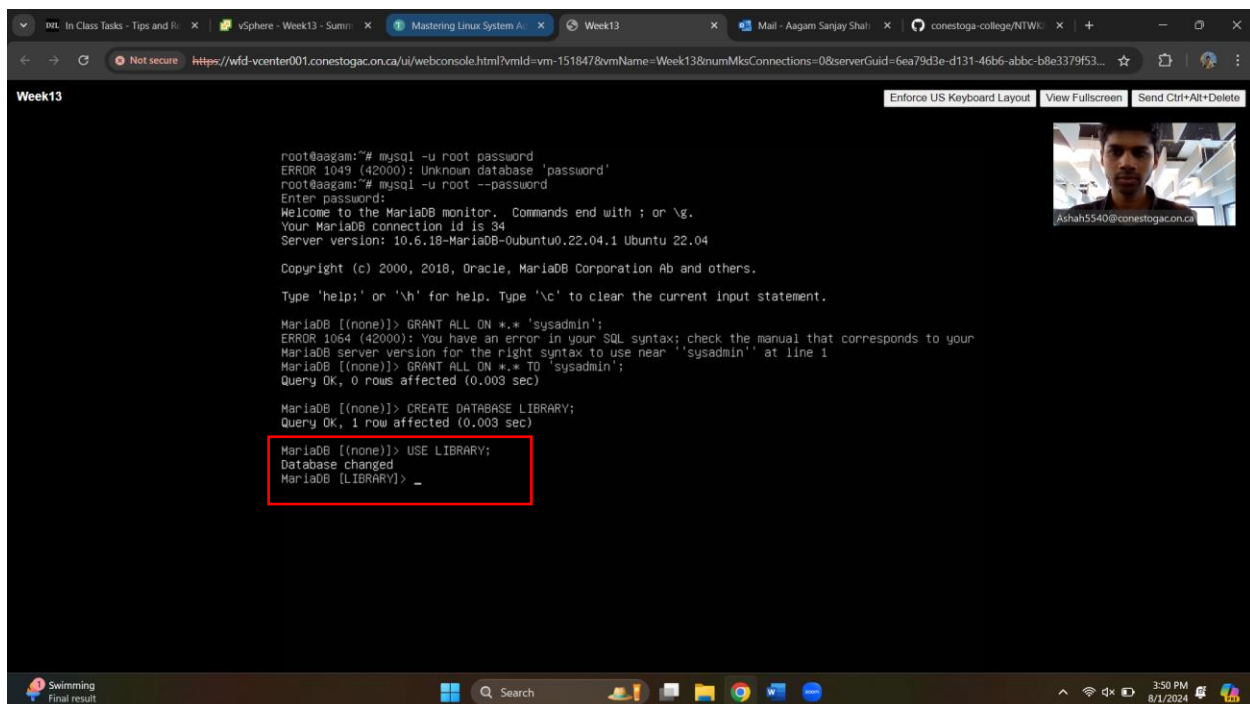
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> GRANT ALL ON *.* 'sysadmin';
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your
MariaDB server version for the right syntax to use near 'sysadmin' at line 1
MariaDB [(none)]> GRANT ALL ON *.* TO 'sysadmin';
Query OK, 0 rows affected (0.003 sec)

MariaDB [(none)]> CREATE DATABASE LIBRARY;
Query OK, 1 row affected (0.003 sec)

MariaDB [(none)]> _
```

13. Select your hobby database by typing **USE *database-name* ;**, replacing *database-name* with the name of your hobby database, and press Enter.



```
root@aagam:~# mysql -u root password
ERROR 1049 (42000): Unknown database 'password'
root@aagam:~# mysql -u root --password
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 34
Server version: 10.6.18-MariaDB-0ubuntu0.22.04.1 Ubuntu 22.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

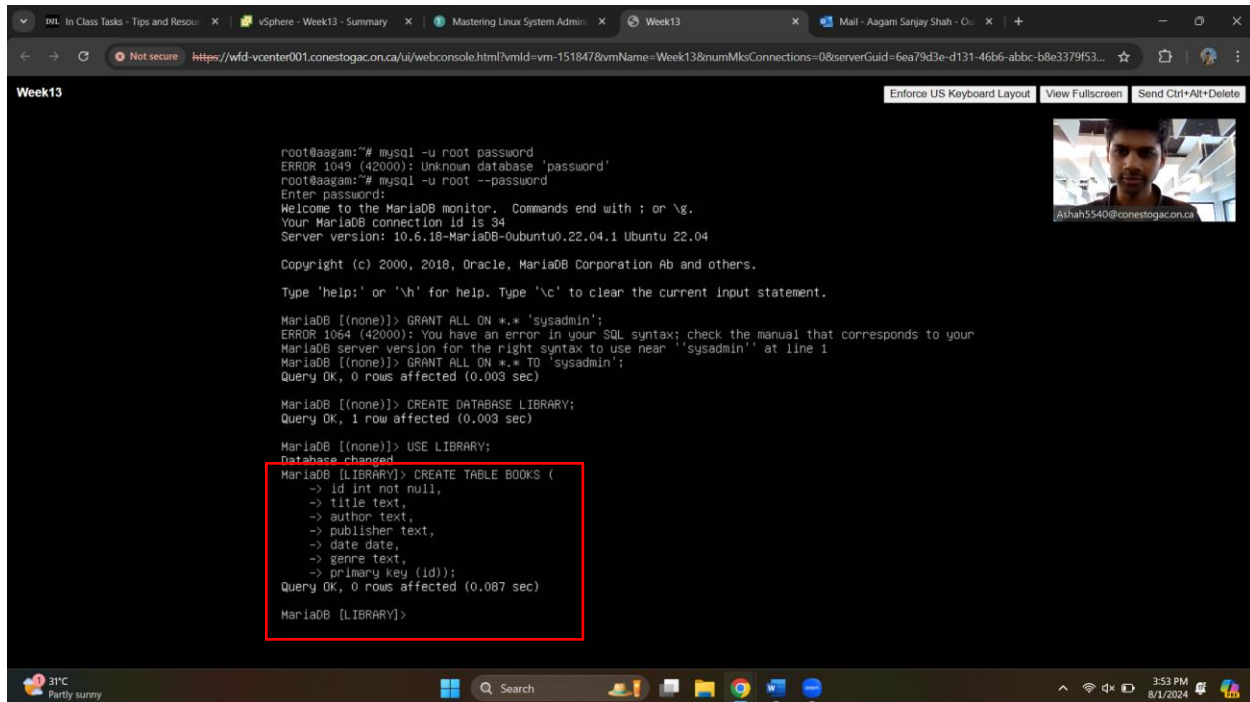
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> GRANT ALL ON *.* 'sysadmin';
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your
MariaDB server version for the right syntax to use near 'sysadmin' at line 1
MariaDB [(none)]> GRANT ALL ON *.* TO 'sysadmin';
Query OK, 0 rows affected (0.003 sec)

MariaDB [(none)]> CREATE DATABASE LIBRARY;
Query OK, 1 row affected (0.003 sec)

MariaDB [(none)]> USE LIBRARY;
Database changed
MariaDB [LIBRARY]> _
```


14. Create your first table in your database. Gather your table's field information from your document, and begin the process by typing **CREATE TABLE *table-name* (**, replacing *table-name* with the name of your first table, and press Enter.



```
root@aaagm:~# mysql -u root password
ERROR 1049 (42000): Unknown database 'password'
root@aaagm:~# mysql -u root --password
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 34
Server version: 10.6.18-MariaDB-0ubuntu0.22.04.1 Ubuntu 22.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

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

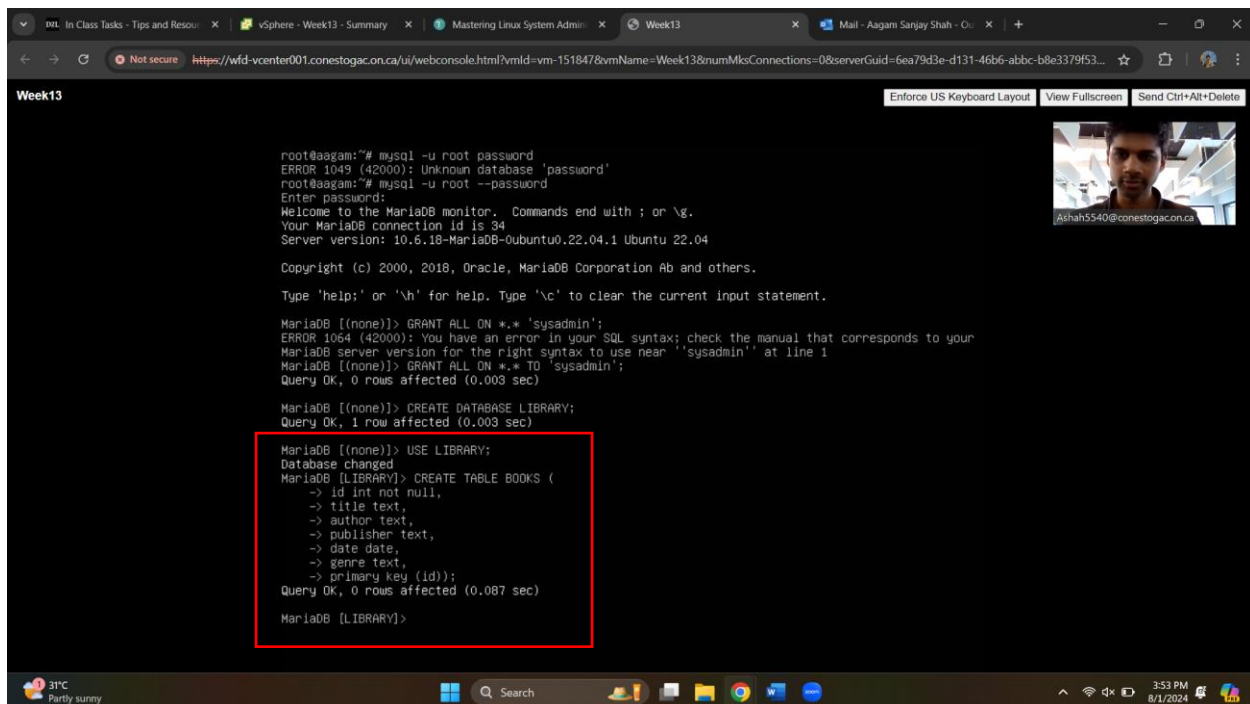
MariaDB [(none)]> GRANT ALL ON *.* 'sysadmin';
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your
MariaDB server version for the right syntax to use near 'sysadmin' at line 1
MariaDB [(none)]> GRANT ALL ON *.* TO 'sysadmin';
Query OK, 0 rows affected (0.003 sec)

MariaDB [(none)]> CREATE DATABASE LIBRARY;
Query OK, 1 row affected (0.003 sec)

MariaDB [(none)]> USE LIBRARY;
Database changed
MariaDB [LIBRARY]> CREATE TABLE BOOKS (
  -> id int not null,
  -> title text,
  -> author text,
  -> publisher text,
  -> date date,
  -> genre text,
  -> primary key (id));
Query OK, 0 rows affected (0.087 sec)

MariaDB [LIBRARY]>
```

15. Using your documented table field information and guidance from this section, continue to create the table by putting in each table field and its data type. Don't forget to include the primary key information.



```
root@aaagm:~# mysql -u root password
ERROR 1049 (42000): Unknown database 'password'
root@aaagm:~# mysql -u root --password
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 34
Server version: 10.6.18-MariaDB-0ubuntu0.22.04.1 Ubuntu 22.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

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

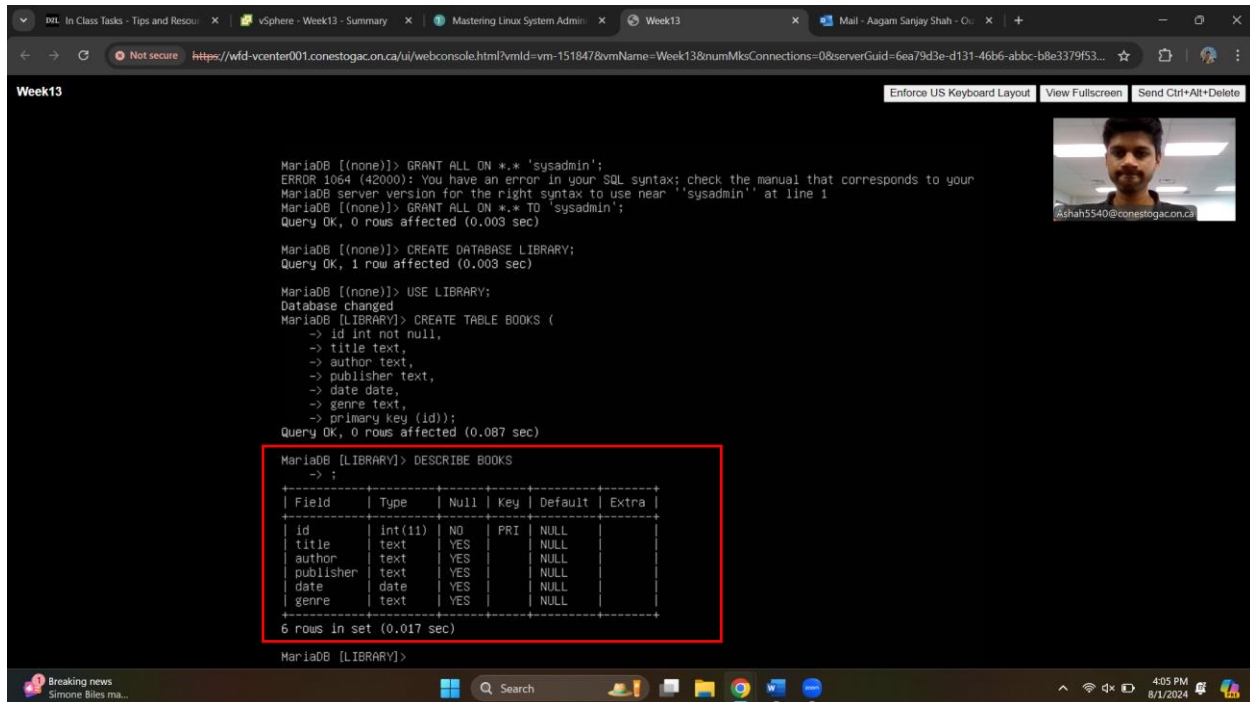
MariaDB [(none)]> GRANT ALL ON *.* 'sysadmin';
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your
MariaDB server version for the right syntax to use near 'sysadmin' at line 1
MariaDB [(none)]> GRANT ALL ON *.* TO 'sysadmin';
Query OK, 0 rows affected (0.003 sec)

MariaDB [(none)]> CREATE DATABASE LIBRARY;
Query OK, 1 row affected (0.003 sec)

MariaDB [(none)]> USE LIBRARY;
Database changed
MariaDB [LIBRARY]> CREATE TABLE BOOKS (
  -> id int not null,
  -> title text,
  -> author text,
  -> publisher text,
  -> date date,
  -> genre text,
  -> primary key (id));
Query OK, 0 rows affected (0.087 sec)

MariaDB [LIBRARY]>
```

16. After you have completed creating your first table, review its structure by typing **DESCRIBE table-name ;**, replacing *table-name* with the name of your first table, and press Enter. If you find any problems, you can use the **DROP** command to delete the table and re-create it properly.



```
MariaDB [(none)]> GRANT ALL ON *.* 'sysadmin';
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your
MariaDB server version for the right syntax to use near 'sysadmin' at line 1
MariaDB [(none)]> GRANT ALL ON *.* TO 'sysadmin';
Query OK, 0 rows affected (0.003 sec)

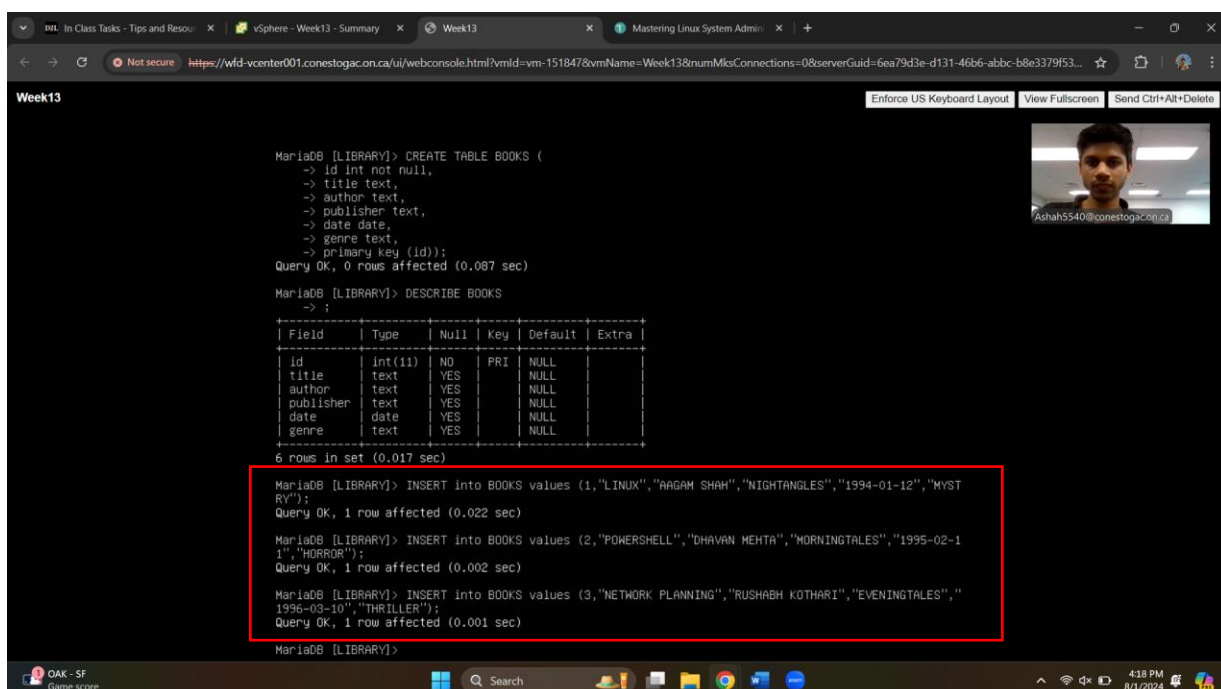
MariaDB [(none)]> CREATE DATABASE LIBRARY;
Query OK, 1 row affected (0.003 sec)

MariaDB [(none)]> USE LIBRARY;
Database changed
MariaDB [LIBRARY]> CREATE TABLE BOOKS (
  -> id int not null,
  -> title text,
  -> author text,
  -> publisher text,
  -> date date,
  -> genre text,
  -> primary key (id));
Query OK, 0 rows affected (0.087 sec)

MariaDB [LIBRARY]> DESCRIBE BOOKS
-> ;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| id    | int(11) | NO   | PRI | NULL    |       |
| title | text   | YES  |     | NULL    |       |
| author | text   | YES  |     | NULL    |       |
| publisher | text | YES  |     | NULL    |       |
| date  | date   | YES  |     | NULL    |       |
| genre | text   | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.017 sec)

MariaDB [LIBRARY]>
```

17. When you are satisfied with your first table's structure, begin populating the table with your hobby data using the appropriate INSERT INTO commands along with guidance from this section.



```
MariaDB [LIBRARY]> CREATE TABLE BOOKS (
  -> id int not null,
  -> title text,
  -> author text,
  -> publisher text,
  -> date date,
  -> genre text,
  -> primary key (id));
Query OK, 0 rows affected (0.087 sec)

MariaDB [LIBRARY]> DESCRIBE BOOKS
-> ;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| id    | int(11) | NO   | PRI | NULL    |       |
| title | text   | YES  |     | NULL    |       |
| author | text   | YES  |     | NULL    |       |
| publisher | text | YES  |     | NULL    |       |
| date  | date   | YES  |     | NULL    |       |
| genre | text   | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.017 sec)

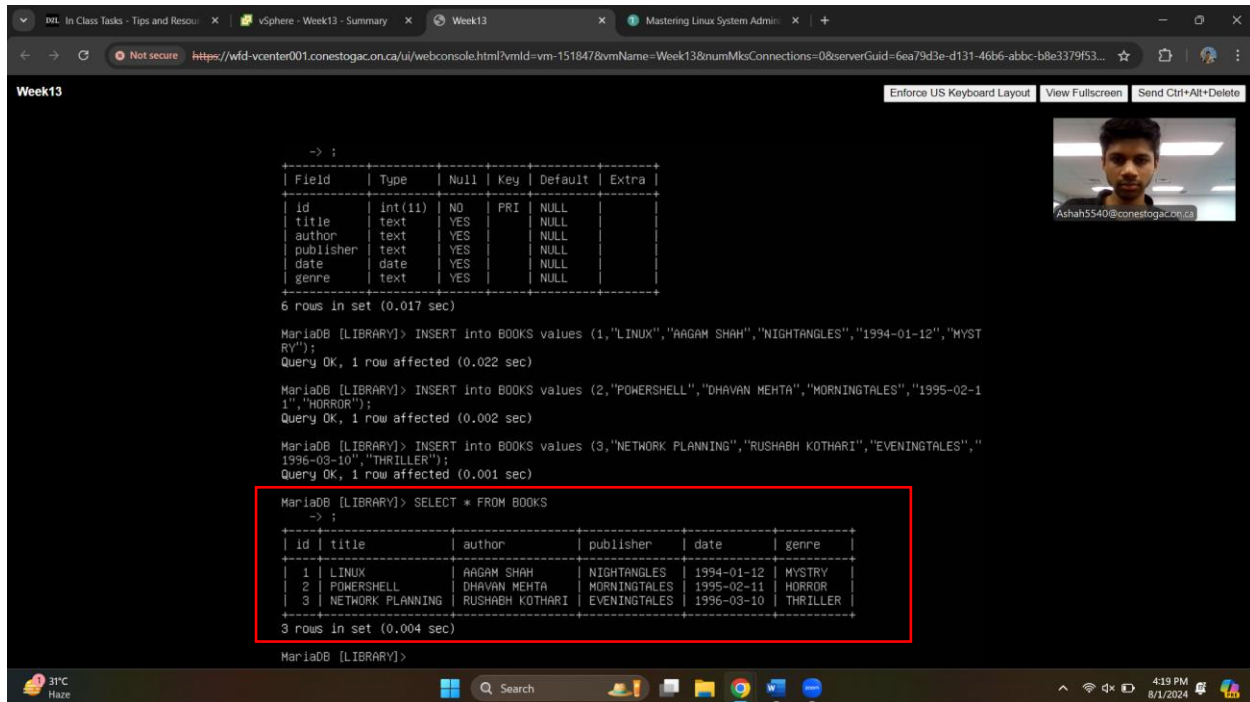
MariaDB [LIBRARY]> INSERT into BOOKS values (1,"LINUX","RAGAM SHAH","NIGHTANGLES","1994-01-12","MYST
RY");
Query OK, 1 row affected (0.022 sec)

MariaDB [LIBRARY]> INSERT into BOOKS values (2,"POWERSHELL","DHAVAN MEHTA","MORNINGTALES","1995-02-1
1","HORROR");
Query OK, 1 row affected (0.002 sec)

MariaDB [LIBRARY]> INSERT into BOOKS values (3,"NETWORK PLANNING","RUSHABH KOTHARI","EVENINGTALES","
1996-03-10","THRILLER");
Query OK, 1 row affected (0.001 sec)

MariaDB [LIBRARY]>
```

18. After you have completed your data entry into your first table, review the data by typing **SELECT * FROM table-name ;**, replacing *table-name* with the name of your first table, and press Enter. If you find any incorrect data, modify it using the **UPDATE** command along with guidance from this section.



Week13

Enforce US Keyboard Layout View Fullscreen Send Ctrl+Alt+Delete

```
--> ;
```

Field	Type	Null	Key	Default	Extra
id	Int(11)	NO	PRI	NULL	
title	text	YES		NULL	
author	text	YES		NULL	
publisher	text	YES		NULL	
date	date	YES		NULL	
genre	text	YES		NULL	

6 rows in set (0.017 sec)

```
MariaDB [LIBRARY]> INSERT into BOOKS values (1,"LINUX","AAGAM SHAH","NIGHTANGLES","1994-01-12","MYSTRY");
Query OK, 1 row affected (0.022 sec)

MariaDB [LIBRARY]> INSERT into BOOKS values (2,"POWERSHELL","DHAVAN MEHTA","MORNINGTALES","1995-02-11","HORROR");
Query OK, 1 row affected (0.002 sec)

MariaDB [LIBRARY]> INSERT into BOOKS values (3,"NETWORK PLANNING","RUSHABH KOTHARI","EVENINGTALES","1996-03-10","THRILLER");
Query OK, 1 row affected (0.001 sec)

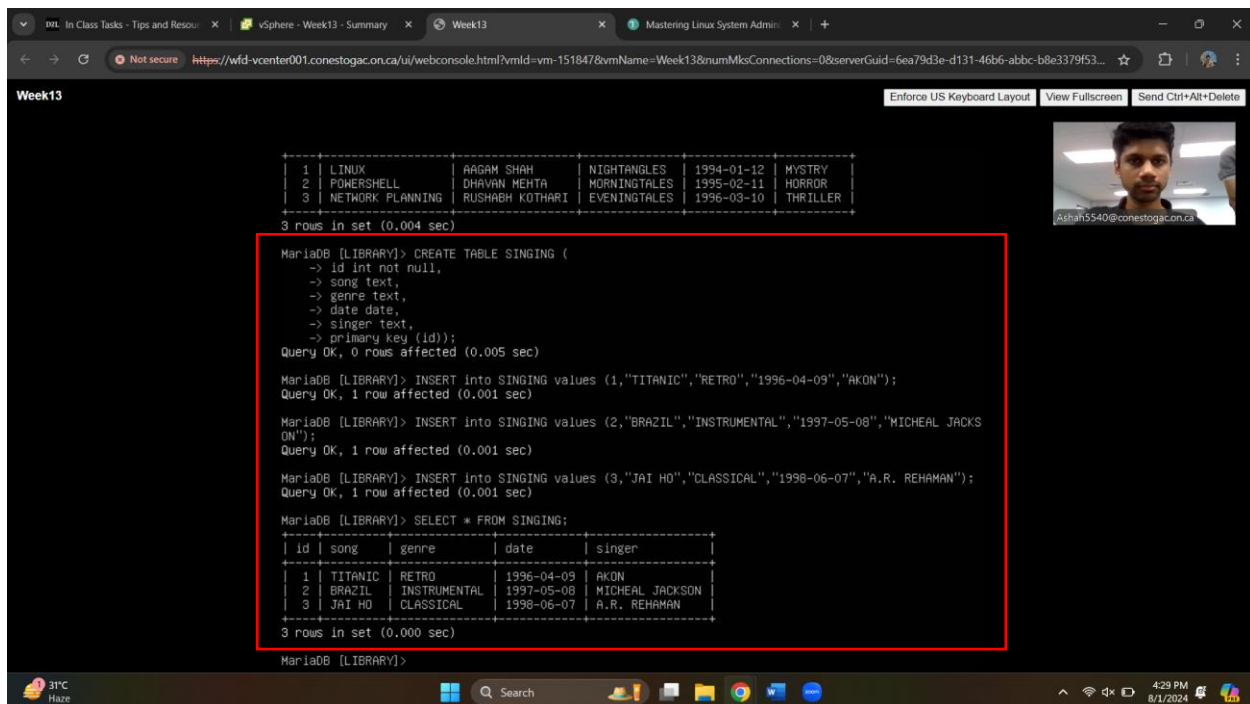
MariaDB [LIBRARY]> SELECT * FROM BOOKS
--> ;
```

id	title	author	publisher	date	genre
1	LINUX	AAGAM SHAH	NIGHTANGLES	1994-01-12	MYSTRY
2	POWERSHELL	DHAVAN MEHTA	MORNINGTALES	1995-02-11	HORROR
3	NETWORK PLANNING	RUSHABH KOTHARI	EVENINGTALES	1996-03-10	THRILLER

3 rows in set (0.004 sec)

```
MariaDB [LIBRARY]>
```

19. When your first table is completed to your satisfaction, continue creating and populating the tables needed for your hobby database.



Week13

Enforce US Keyboard Layout View Fullscreen Send Ctrl+Alt+Delete

```
--> ;
```

id	song	genre	date	singer
1	TITANIC	RETRO	1996-04-09	AKON
2	BRAZIL	INSTRUMENTAL	1997-05-08	MICHAEL JACKSON
3	JAI HO	CLASSICAL	1998-06-07	A.R. REHAMAN

3 rows in set (0.004 sec)

```
MariaDB [LIBRARY]> CREATE TABLE SINGING (
--> id int not null,
--> song text,
--> genre text,
--> date date,
--> singer text,
--> primary key (id));
Query OK, 0 rows affected (0.005 sec)

MariaDB [LIBRARY]> INSERT into SINGING values (1,"TITANIC","RETRO","1996-04-09","AKON");
Query OK, 1 row affected (0.001 sec)

MariaDB [LIBRARY]> INSERT into SINGING values (2,"BRAZIL","INSTRUMENTAL","1997-05-08","MICHAEL JACKSON");
Query OK, 1 row affected (0.001 sec)

MariaDB [LIBRARY]> INSERT into SINGING values (3,"JAI HO","CLASSICAL","1998-06-07","A.R. REHAMAN");
Query OK, 1 row affected (0.001 sec)

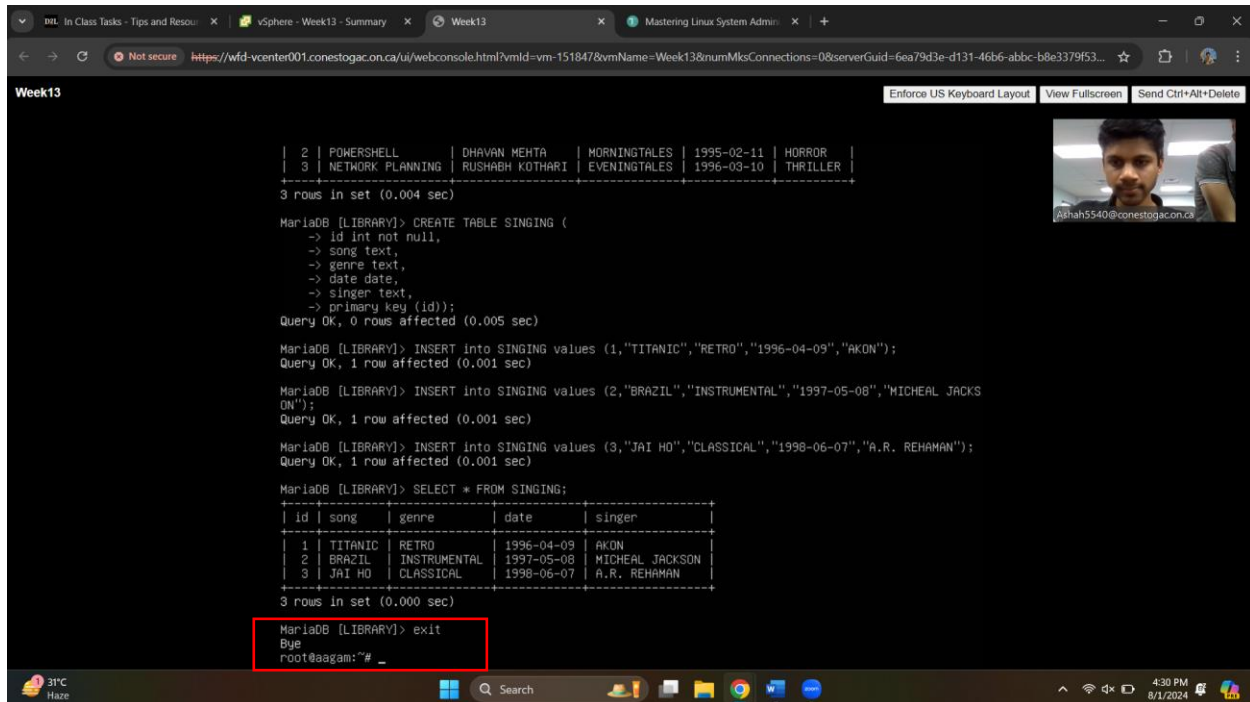
MariaDB [LIBRARY]> SELECT * FROM SINGING;
--> ;
```

id	song	genre	date	singer
1	TITANIC	RETRO	1996-04-09	AKON
2	BRAZIL	INSTRUMENTAL	1997-05-08	MICHAEL JACKSON
3	JAI HO	CLASSICAL	1998-06-07	A.R. REHAMAN

3 rows in set (0.000 sec)

```
MariaDB [LIBRARY]>
```

20. When you are done, type **exit** and press Enter to leave the SQL interface for MariaDB. Congratulations! We hope your hobby database will assist in your enjoyment of your favorite hobby.



The screenshot shows a web browser window with a URL pointing to a vCenter console. The console displays a MariaDB SQL session. The session includes creating a table, inserting three rows, and selecting all rows. The 'exit' command is highlighted with a red box.

```
Week13
```

	2	POWERSHELL	DHAVAN MEHTA	MORNINGTALES	1995-02-11	HORROR
	3	NETWORK PLANNING	RUSHABH KOTHARI	EVENINGTALES	1996-03-10	THRILLER

3 rows in set (0.004 sec)

```
MariaDB [LIBRARY]> CREATE TABLE SINGING (
  -> id int not null,
  -> song text,
  -> genre text,
  -> date date,
  -> singer text,
  -> primary key (id));
Query OK, 0 rows affected (0.005 sec)

MariaDB [LIBRARY]> INSERT into SINGING values (1,"TITANIC","RETRO","1996-04-09","AKON");
Query OK, 1 row affected (0.001 sec)

MariaDB [LIBRARY]> INSERT into SINGING values (2,"BRAZIL","INSTRUMENTAL","1997-05-08","MICHEAL JACKSON");
Query OK, 1 row affected (0.001 sec)

MariaDB [LIBRARY]> INSERT into SINGING values (3,"JAI HO","CLASSICAL","1998-06-07","A.R. REHAMAN");
Query OK, 1 row affected (0.001 sec)

MariaDB [LIBRARY]> SELECT * FROM SINGING;
+----+-----+-----+-----+-----+
| id | song  | genre | date   | singer          |
+----+-----+-----+-----+-----+
| 1  | TITANIC | RETRO | 1996-04-09 | AKON            |
| 2  | BRAZIL  | INSTRUMENTAL | 1997-05-08 | MICHEAL JACKSON |
| 3  | JAI HO  | CLASSICAL | 1998-06-07 | A.R. REHAMAN    |
+----+-----+-----+-----+-----+
3 rows in set (0.000 sec)

MariaDB [LIBRARY]> exit
Bye
root@aagam:~#
```