

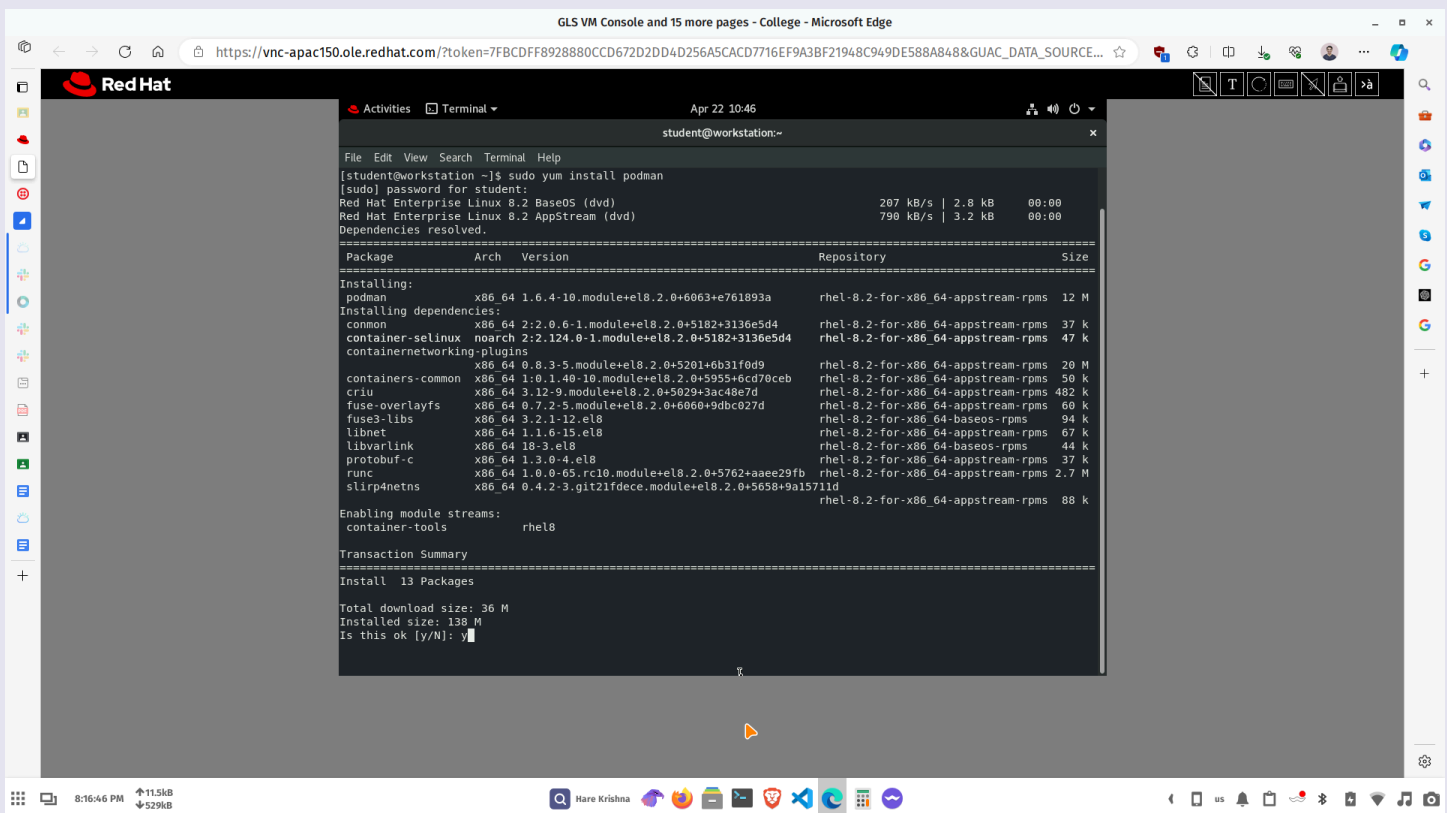
Name - Yash Lakhtariya
Enrollment number - 21162101012
Branch - CBA Batch - 61
ITIM Practical 13

1) Task 1 :

- Perform from Web user
- pull a httpd image from registry.redhat.io
- Use your rhel id and password for login
- perform port forwarding
- perform persistent mounting
- container must be managed using systemctl comamnds

Steps and Screenshots :

1. Install podman using yum package manager



The screenshot shows a terminal window within a Red Hat VM console. The user is logged in as 'student@workstation'. The terminal output shows the command 'sudo yum install podman' being executed. The output indicates that the package 'podman' and its dependencies are being installed from the 'rhel-8.2-for-x86_64-appstream-rpms' repository. The transaction summary shows that 13 packages will be installed, with a total download size of 36 M and an installed size of 138 M. The user is prompted to confirm the installation with 'y'.

```
student@workstation:~$ sudo yum install podman
[sudo] password for student:
Red Hat Enterprise Linux 8.2 BaseOS (dvd)                207 kB/s | 2.8 kB    00:00
Red Hat Enterprise Linux 8.2 AppStream (dvd)             790 kB/s | 3.2 kB    00:00
Dependencies resolved.
=====
Package            Arch      Version                                Repository      Size
=====
Installing:
podman              x86_64    1.6.4-10.module+el8.2.0+6063+e761893a  rhel-8.2-for-x86_64-appstream-rpms 12 M
Installing dependencies:
common              x86_64    2:2.0.6-1.module+el8.2.0+5182+3136e5d4  rhel-8.2-for-x86_64-appstream-rpms 37 k
container-selinux   noarch    2:2.124.0-1.module+el8.2.0+5182+3136e5d4  rhel-8.2-for-x86_64-appstream-rpms 47 k
containernetworking-plugins x86_64    0.8.3-5.module+el8.2.0+5201+6b31f0d9     rhel-8.2-for-x86_64-appstream-rpms 20 M
containers-common   x86_64    1:0.1.40-10.module+el8.2.0+5955+6cd70ceb  rhel-8.2-for-x86_64-appstream-rpms 50 k
criu                 x86_64    3.12-9.module+el8.2.0+5029+3ac48e7d      rhel-8.2-for-x86_64-appstream-rpms 482 k
fuse-overlaysfs     x86_64    0.7.2-5.module+el8.2.0+6060+9dbc027d     rhel-8.2-for-x86_64-appstream-rpms 60 k
fuse3-libs          x86_64    3.2.1-12.el8                              rhel-8.2-for-x86_64-baseos-rpms    94 k
libnet               x86_64    1.1.6-15.el8                              rhel-8.2-for-x86_64-appstream-rpms 67 k
libvarlink           x86_64    18-3.el8                                  rhel-8.2-for-x86_64-baseos-rpms    44 k
protobuf-c          x86_64    1.3.0-4.el8                              rhel-8.2-for-x86_64-appstream-rpms 37 k
runc                 x86_64    1.0.0-65.rc10.module+el8.2.0+5762+aaee29fb rhel-8.2-for-x86_64-appstream-rpms 2.7 M
slirp4netns         x86_64    0.4.2-3.git21fdece.module+el8.2.0+5658+9a15711d rhel-8.2-for-x86_64-appstream-rpms 88 k

Enabling module streams:
container-tools     rhel8

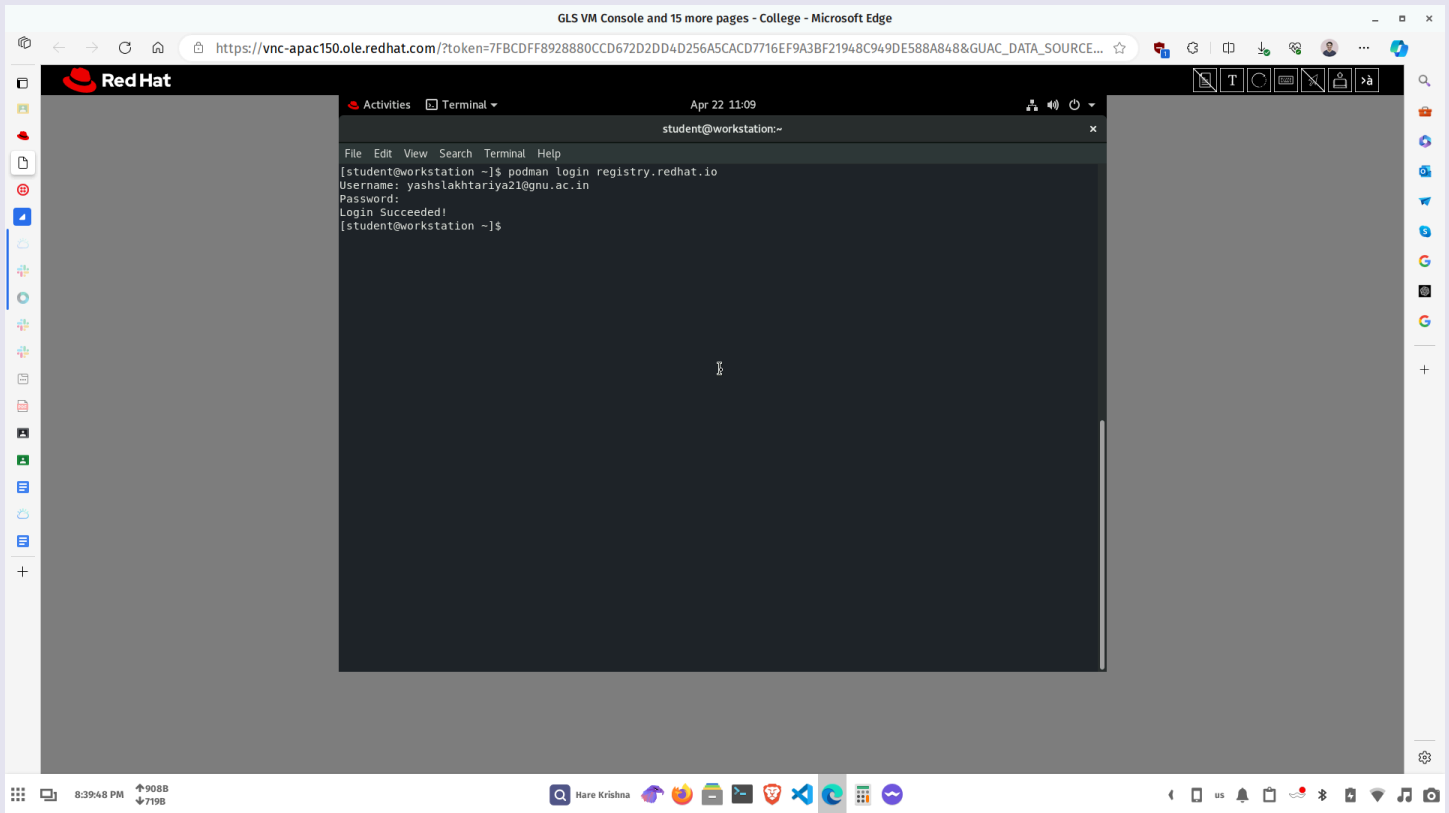
Transaction Summary
=====
Install 13 Packages

Total download size: 36 M
Installed size: 138 M
Is this ok [y/N]: y
```

Command : ***sudo yum install podman***

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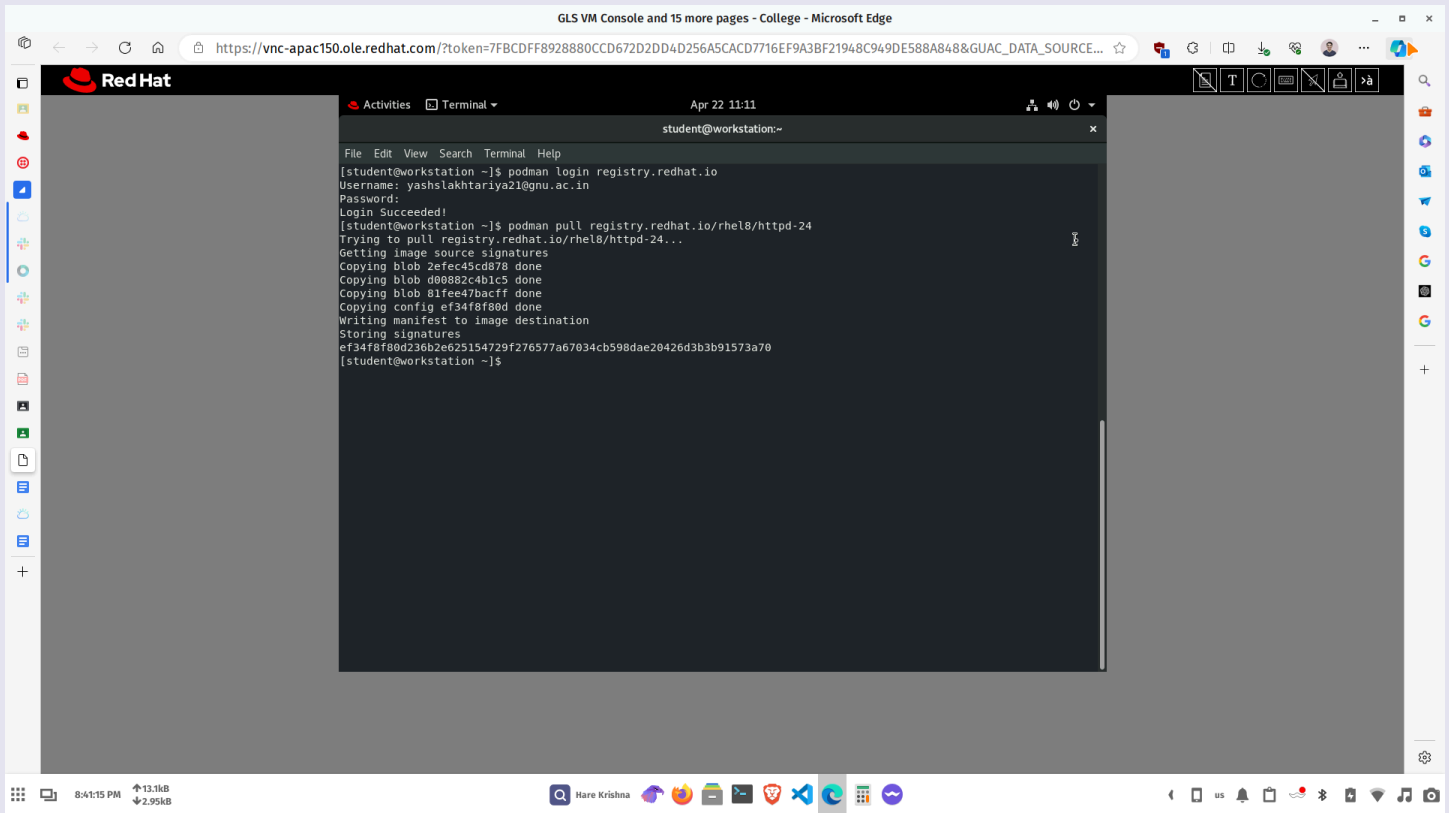
2. Login to podman registry using RHA credentials



Command : ***podman login registry.redhat.io***

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3. Pull the latest httpd image from registry



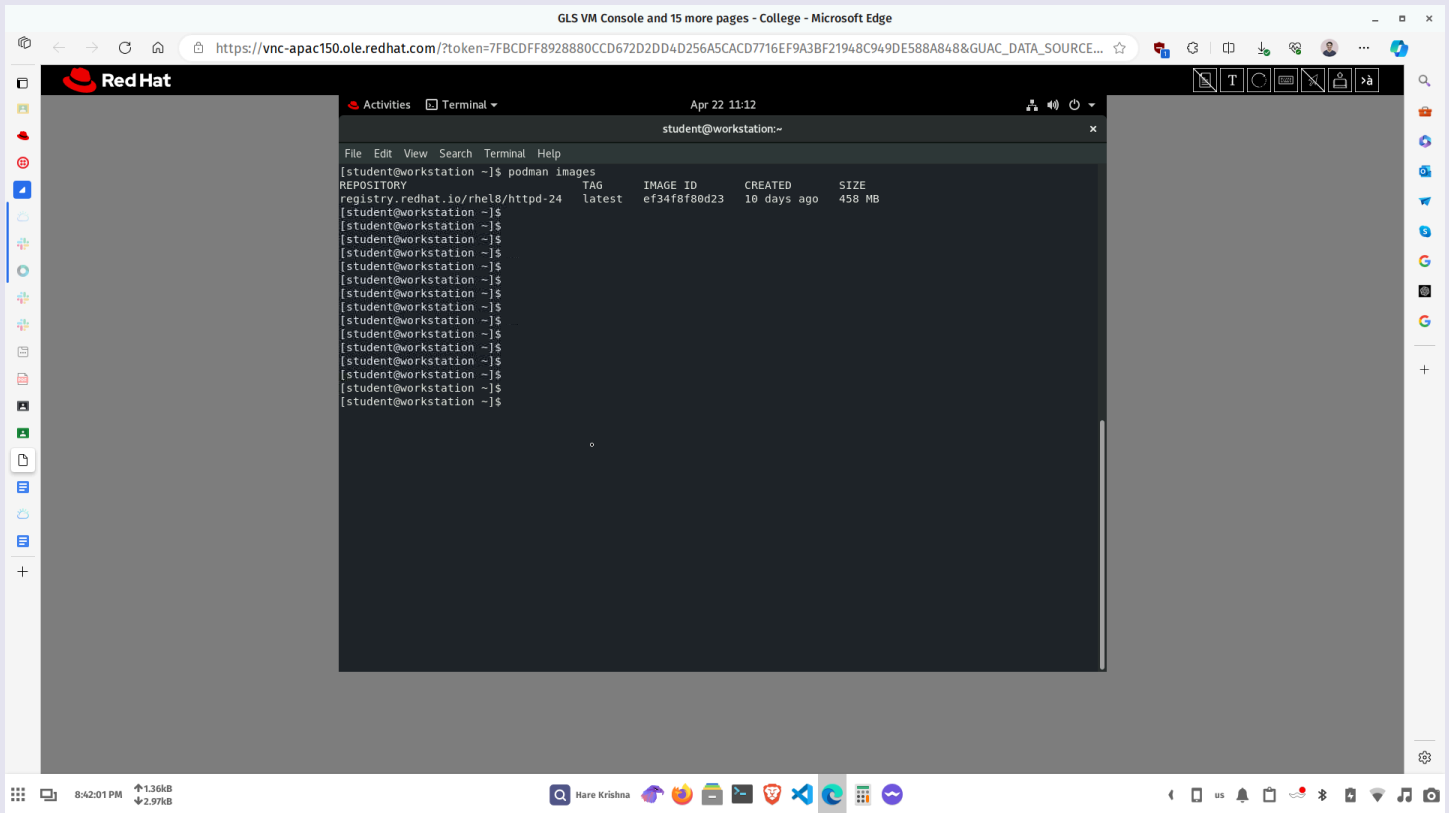
The screenshot shows a Red Hat VM console window titled "GLS VM Console and 15 more pages - College - Microsoft Edge". The URL in the address bar is "https://vnc-apac150.ole.redhat.com/?token=7FBCDF8928880CCD672D2DD4D256A5CACD7716EF9A3BF21948C949DE588A848&GUAC_DATA_SOURCE...". The console window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal output shows the following commands and their results:

```
student@workstation:~  
[student@workstation ~]$ podman login registry.redhat.io  
Username: yashlakhtariya21@gnu.ac.in  
Password:  
Login Succeeded!  
[student@workstation ~]$ podman pull registry.redhat.io/rhel8/httpd-24  
Trying to pull registry.redhat.io/rhel8/httpd-24...  
Getting image source signatures  
Copying blob 2efec45cd878 done  
Copying blob d88882c4b1e5 done  
Copying blob 81fee47bacff done  
Copying config ef34f8f80d done  
Writing manifest to image destination  
Storing signatures  
ef34f8f80d236b2e625154729f276577a67034cb598dae20426d3b3b91573a70  
[student@workstation ~]$
```

Command : ***podman pull registry.redhat.io/rhel8/httpd-24***

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4. Check the existing image(s) in the system



The screenshot shows a Red Hat VM console window titled "GLS VM Console and 15 more pages - College - Microsoft Edge". The terminal window is titled "student@workstation:~" and shows the command "podman images" being executed. The output is a table with columns: REPOSITORY, TAG, IMAGE ID, CREATED, and SIZE. The output shows one image: "registry.redhat.io/rhel8/httpd-24 latest ef3478f80d23 10 days ago 458 MB".

```
student@workstation ~]$ podman images
```

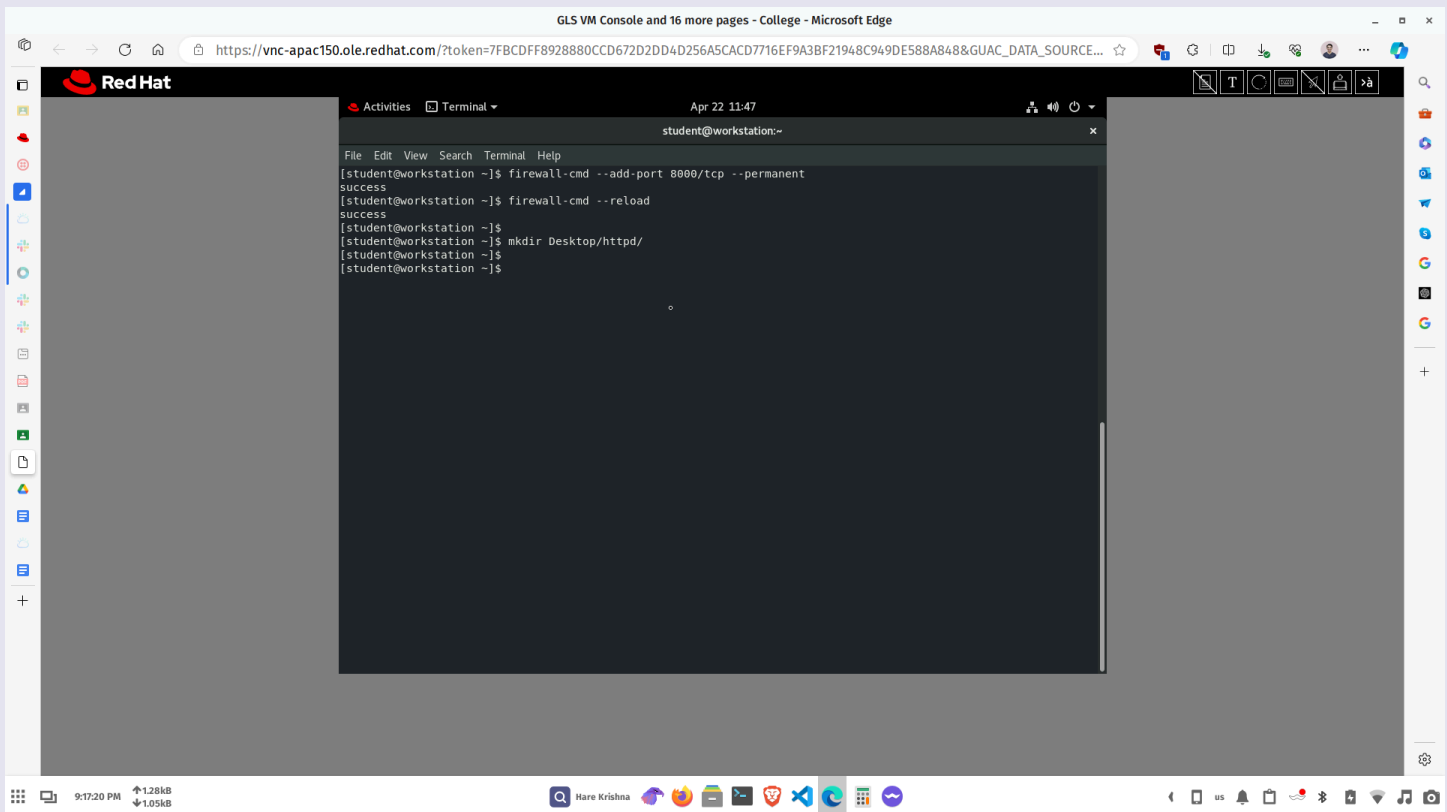
REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
registry.redhat.io/rhel8/httpd-24	latest	ef3478f80d23	10 days ago	458 MB

```
student@workstation ~]$
```

Command : ***podman images***

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5. Add 8000 port via tcp to firewall to allow container connection and create directory to mount persistent changes of container



The screenshot shows a terminal window titled "Red Hat" with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Apr 22 11:47, student@workstation:~). The terminal displays the following commands and their outputs:

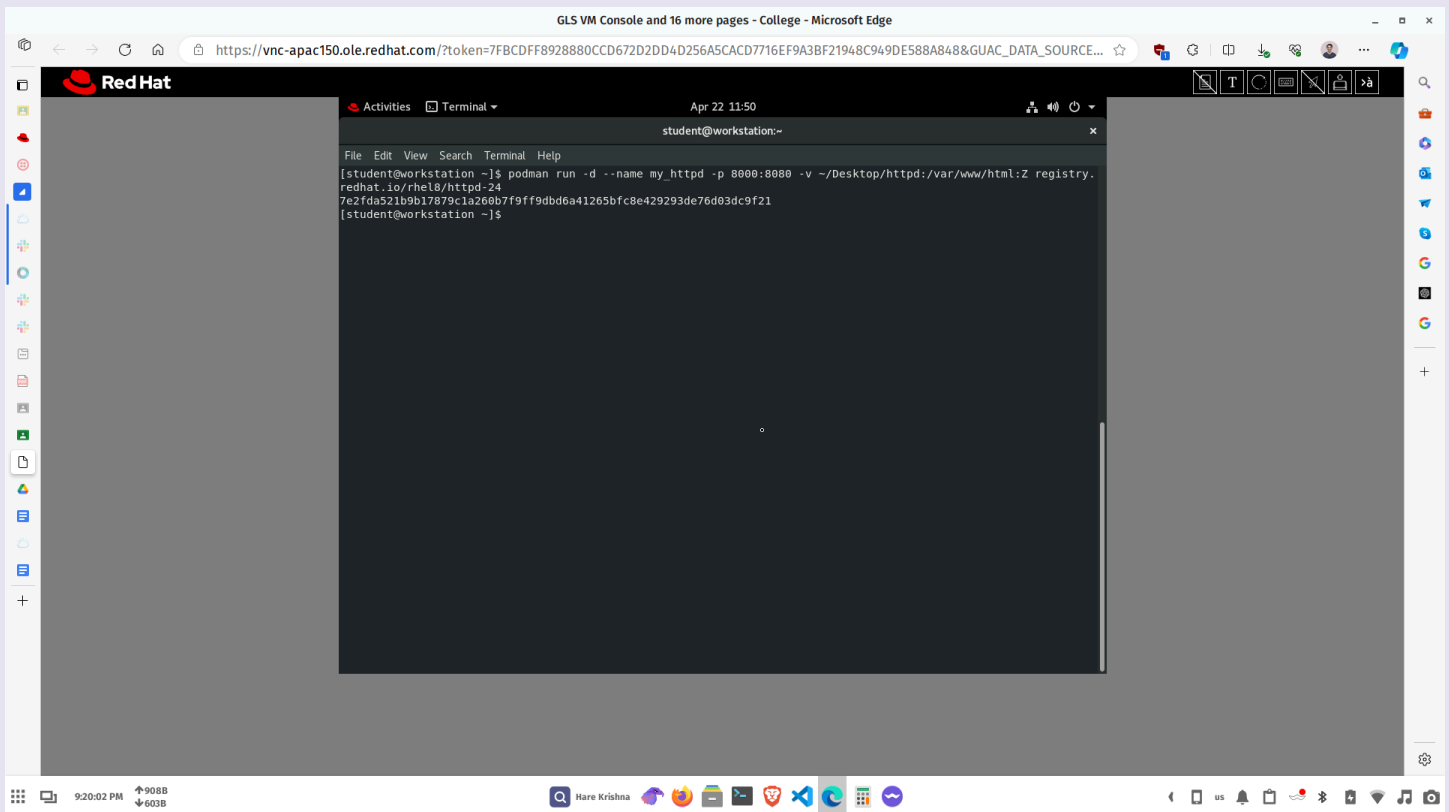
```
[student@workstation ~]$ firewall-cmd --add-port 8000/tcp --permanent
success
[student@workstation ~]$ firewall-cmd --reload
success
[student@workstation ~]$
[student@workstation ~]$ mkdir Desktop/httpd/
[student@workstation ~]$
```

Commands :

- ***firewall-cmd --add-port=8000/tcp --permanent***
- ***firewall-cmd --reload***
- ***mkdir Desktop/httpd/***

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6. Run the podman container using downloaded image with port forwarding and persistent mount

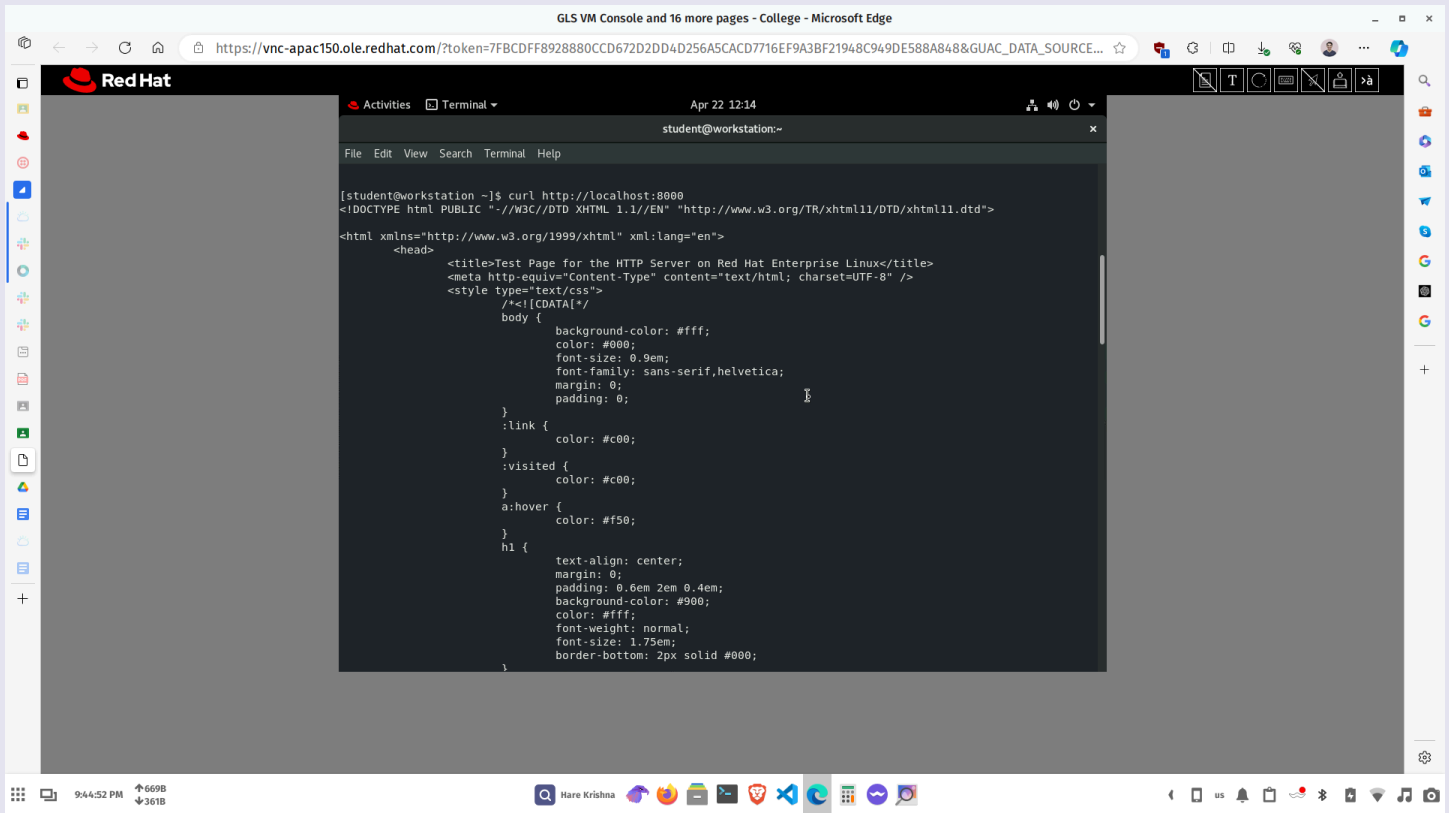


Command : ***podman run -d --name my_httpd -p 8000:8080 -v
~/Desktop/httpd:/var/www/html:Z registry.redhat.io/rhel8/httpd-24***

(Here, host_path:container_path:drive_letter format is followed for mounting volume via option -v, -d is for detached container run, while -p stands for port forwarding from host 8000 to container 8080)

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7. Now, test using curl on localhost if it returns html file

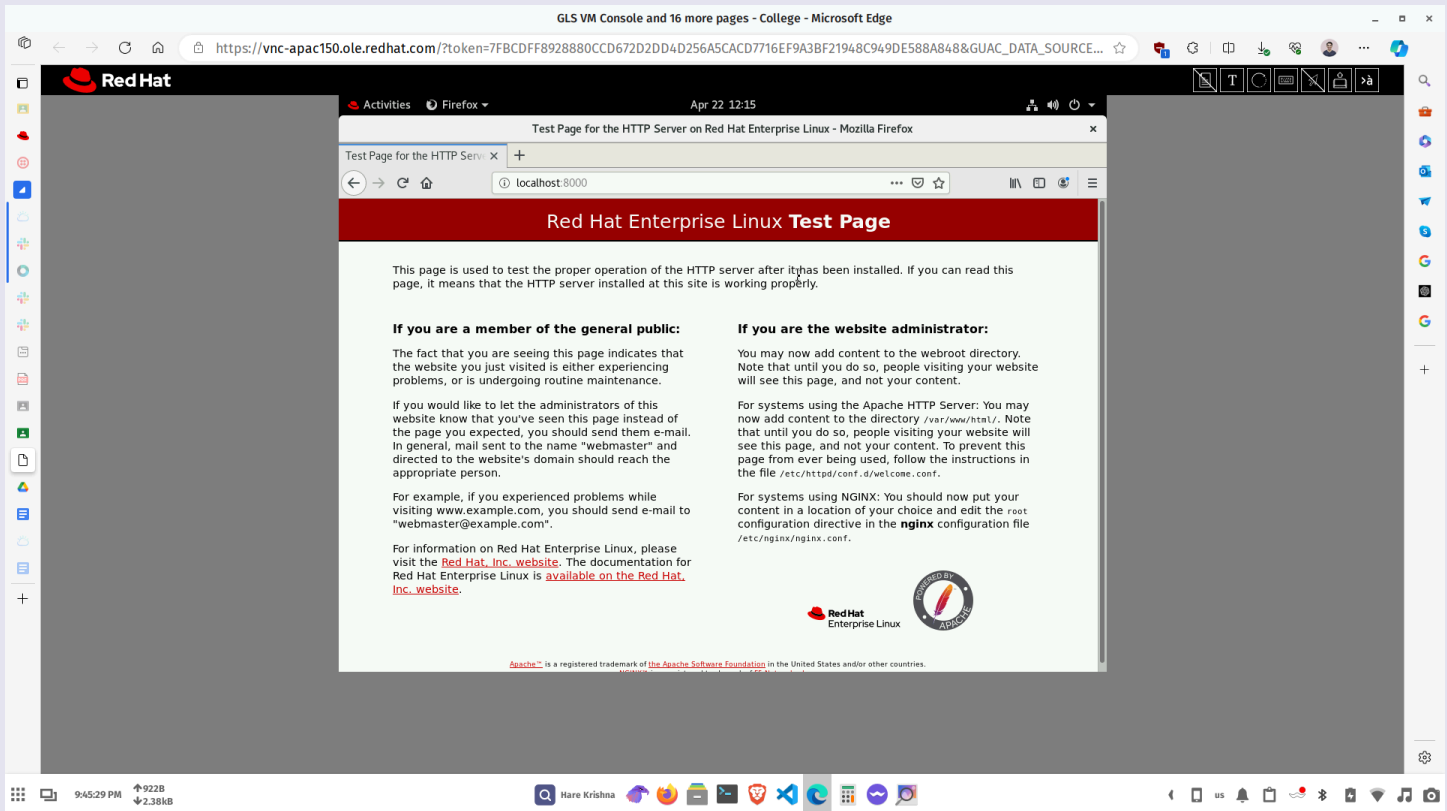


The screenshot shows a Red Hat VM console window titled "GLS VM Console and 16 more pages - College - Microsoft Edge". The terminal window is titled "student@workstation:~" and shows the following command and output:

```
[student@workstation ~]$ curl http://localhost:8000
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN" "http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en">
  <head>
    <title>Test Page for the HTTP Server on Red Hat Enterprise Linux</title>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />
    <style type="text/css">
      /**/
      body {
        background-color: #fff;
        color: #000;
        font-size: 0.9em;
        font-family: sans-serif,helvetica;
        margin: 0;
        padding: 0;
      }
      :link {
        color: #c00;
      }
      :visited {
        color: #c00;
      }
      a:hover {
        color: #f50;
      }
      h1 {
        text-align: center;
        margin: 0;
        padding: 0.6em 2em 0.4em;
        background-color: #900;
        color: #fff;
        font-weight: normal;
        font-size: 1.75em;
        border-bottom: 2px solid #000;
      }
    &lt;/style&gt;
  &lt;/head&gt;
  &lt;body&gt;
    &lt;h1&gt;
      &lt;a href="http://localhost:8000/"&gt;http://localhost:8000/
    &lt;/h1&gt;
  &lt;/body&gt;
&lt;/html&gt;</pre></div><div data-bbox="54 622 457 644" data-label="Text"><p>Command : <b><i>curl http://localhost:8000</i></b></p></div>
```

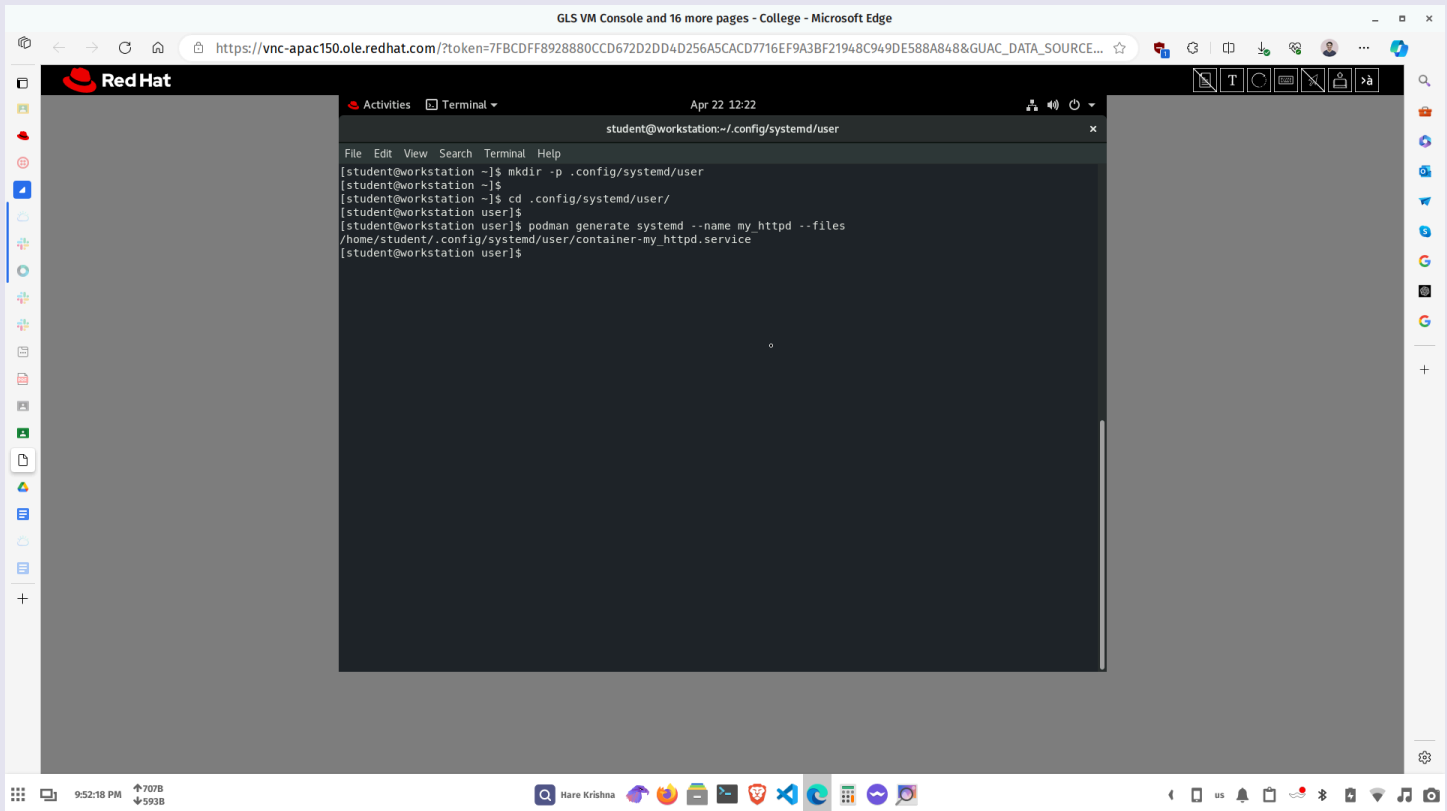
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8. Check on browser also for viewing the html page



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9. Create a systemd/user directories required in .config to store user services and use podman generate command to generate service files for our httpd container



The screenshot shows a Red Hat VM console window titled "GLS VM Console and 16 more pages - College - Microsoft Edge". The terminal window is titled "student@workstation:~/config/systemd/user" and shows the following commands and output:

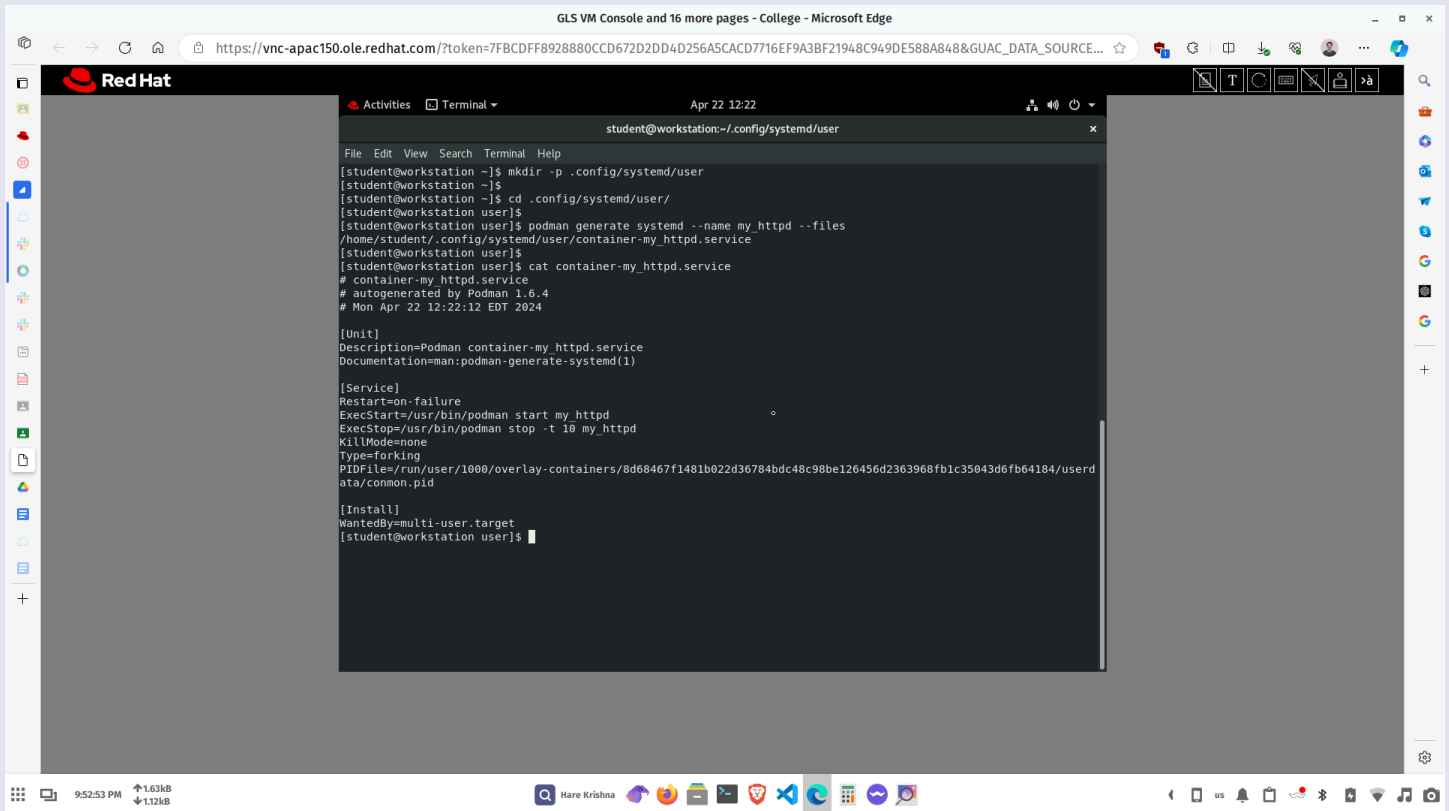
```
student@workstation ~]$ mkdir -p .config/systemd/user
student@workstation ~]$
student@workstation ~]$ cd .config/systemd/user/
student@workstation user]$
student@workstation user]$ podman generate systemd --name my_httpd --files
/home/student/.config/systemd/user/container-my_httpd.service
student@workstation user]$
```

Commands :

- ***mkdir .config/systemd/user***
- ***cd .config/systemd/user***
- ***podman generate systemd --name my_httpd --files***

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10. Check the contents of service file



The screenshot shows a Red Hat VM console window titled "GLS VM Console and 16 more pages - College - Microsoft Edge". The browser address bar shows a URL starting with "https://vnc-apac150.ole.redhat.com/?token=7FBCDFF8928880CCD672D2DD4D256A5CACD7716EF9A3BF21948C949DE588A848&GUAC_DATA_SOURCE...". The console window has a "Red Hat" logo in the top left. The terminal output shows the following commands and their results:

```
student@workstation:~/config/systemd/user
File Edit View Search Terminal Help
[student@workstation ~]$ mkdir -p .config/systemd/user
[student@workstation ~]$ cd .config/systemd/user/
[student@workstation user]$ podman generate systemd --name my_httpd --files
/home/student/.config/systemd/user/container-my_httpd.service
[student@workstation user]$ cat container-my_httpd.service
# container-my_httpd.service
# autogenerated by Podman 1.6.4
# Mon Apr 22 12:22:12 EDT 2024

[Unit]
Description=Podman container-my_httpd.service
Documentation=man:podman-generate-systemd(1)

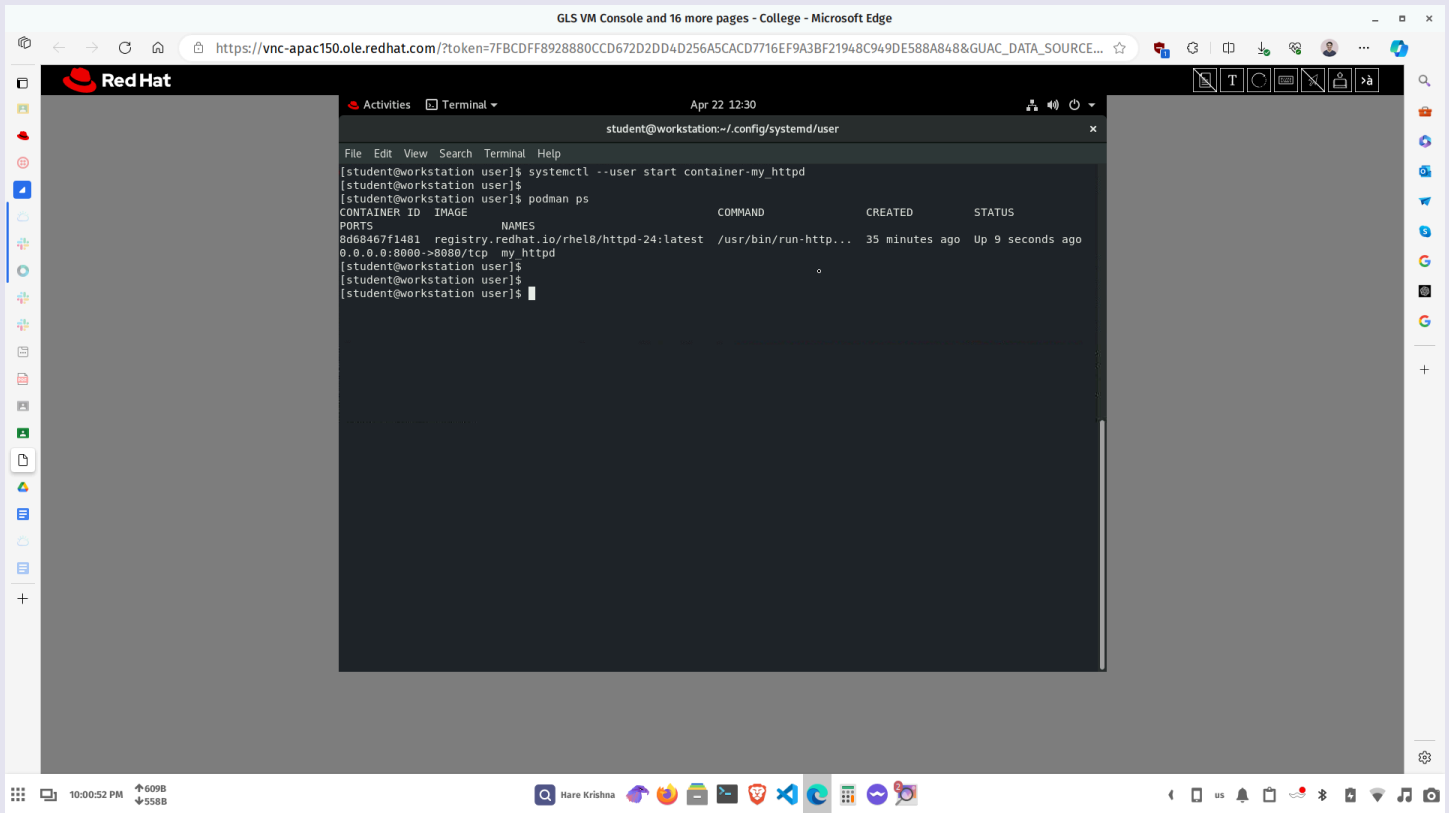
[Service]
Restart=on-failure
ExecStart=/usr/bin/podman start my_httpd
ExecStop=/usr/bin/podman stop -t 10 my_httpd
KillMode=none
Type=forking
PIDFiles=/run/user/1000/overlay-containers/8d68467f1481b022d36784bdc48c98be126456d2363968fb1c35043d6fb64184/userd
ata/common.pid

[Install]
WantedBy=multi-user.target
[student@workstation user]$
```

Command : ***cat container-my_httpd.service***

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11. Now start the service and check if container comes in running state



The screenshot shows a Red Hat VM console window titled "GLS VM Console and 16 more pages - College - Microsoft Edge". The terminal window is titled "student@workstation:~/config/systemd/user" and shows the following commands and output:

```
[student@workstation user]$ systemctl --user start container-my_httpd
[student@workstation user]$
[student@workstation user]$ podman ps
```

CONTAINER ID	IMAGE	NAMES	COMMAND	CREATED	STATUS
8d68467f1481	registry.redhat.io/rhel8/httpd-24:latest		/usr/bin/run-http...	35 minutes ago	Up 9 seconds ago
0.0.0.0:8080->8080/tcp	my_httpd				

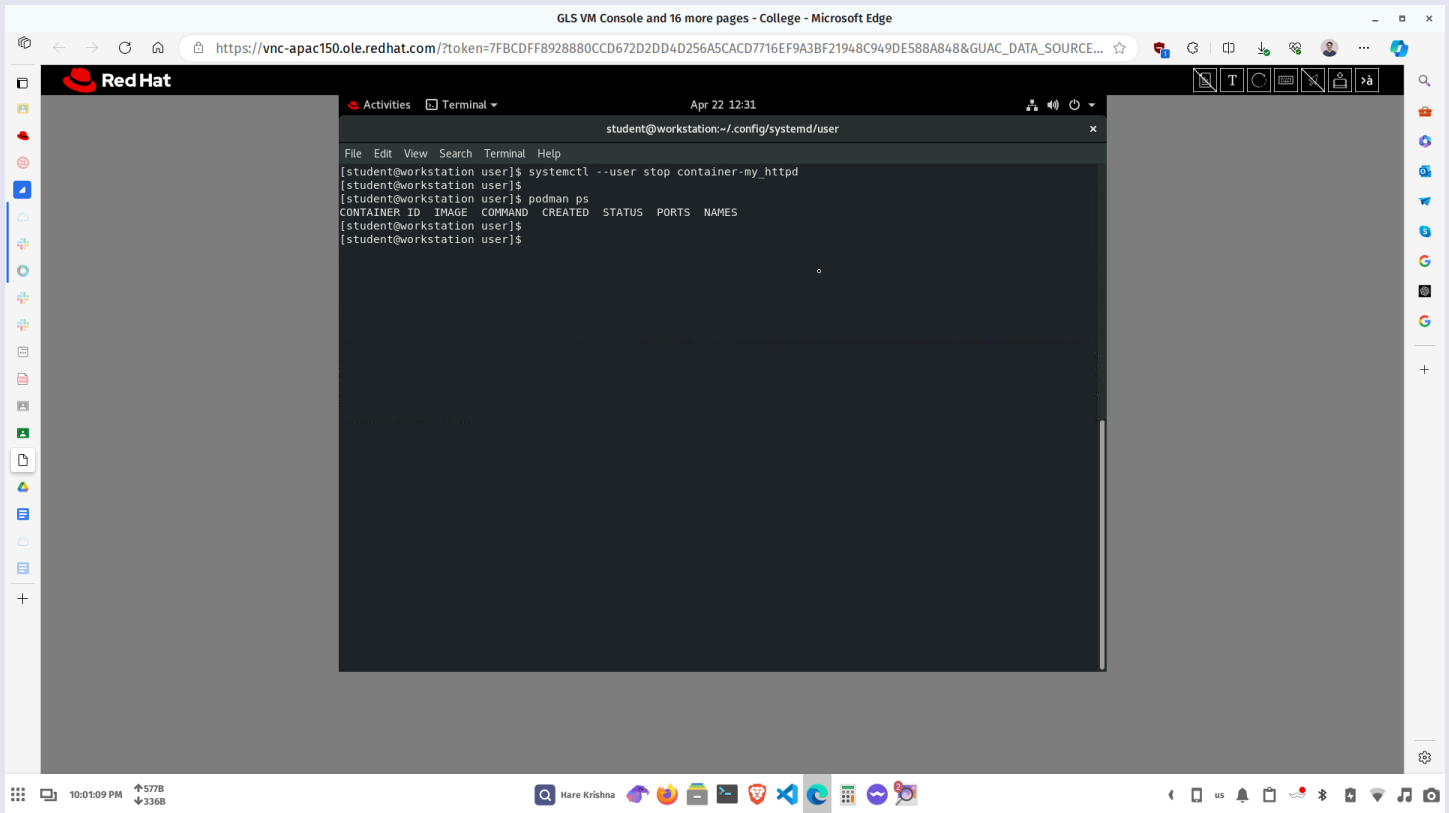
The terminal output shows that the container is running. The bottom status bar of the console window displays the time as 10:00:52 PM, network usage as 609B up and 558B down, and the user as Hare Krishna.

Commands :

- ***systemctl --user start container-my_httpd.service***
- ***podman ps***

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12. Try stopping the service and check if container is stopped



The screenshot shows a Red Hat VM console window titled "GLS VM Console and 16 more pages - College - Microsoft Edge". The terminal window is titled "student@workstation:~/config/systemd/user" and shows the following commands and output:

```
student@workstation user$ systemctl --user stop container-my_httpd
student@workstation user$
student@workstation user$ podman ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
student@workstation user$
student@workstation user$
```

The terminal output shows a table with columns: CONTAINER ID, IMAGE, COMMAND, CREATED, STATUS, PORTS, and NAMES. The table is currently empty.

Commands :

- ***systemctl --user stop container-my_httpd.service***
- ***podman ps***

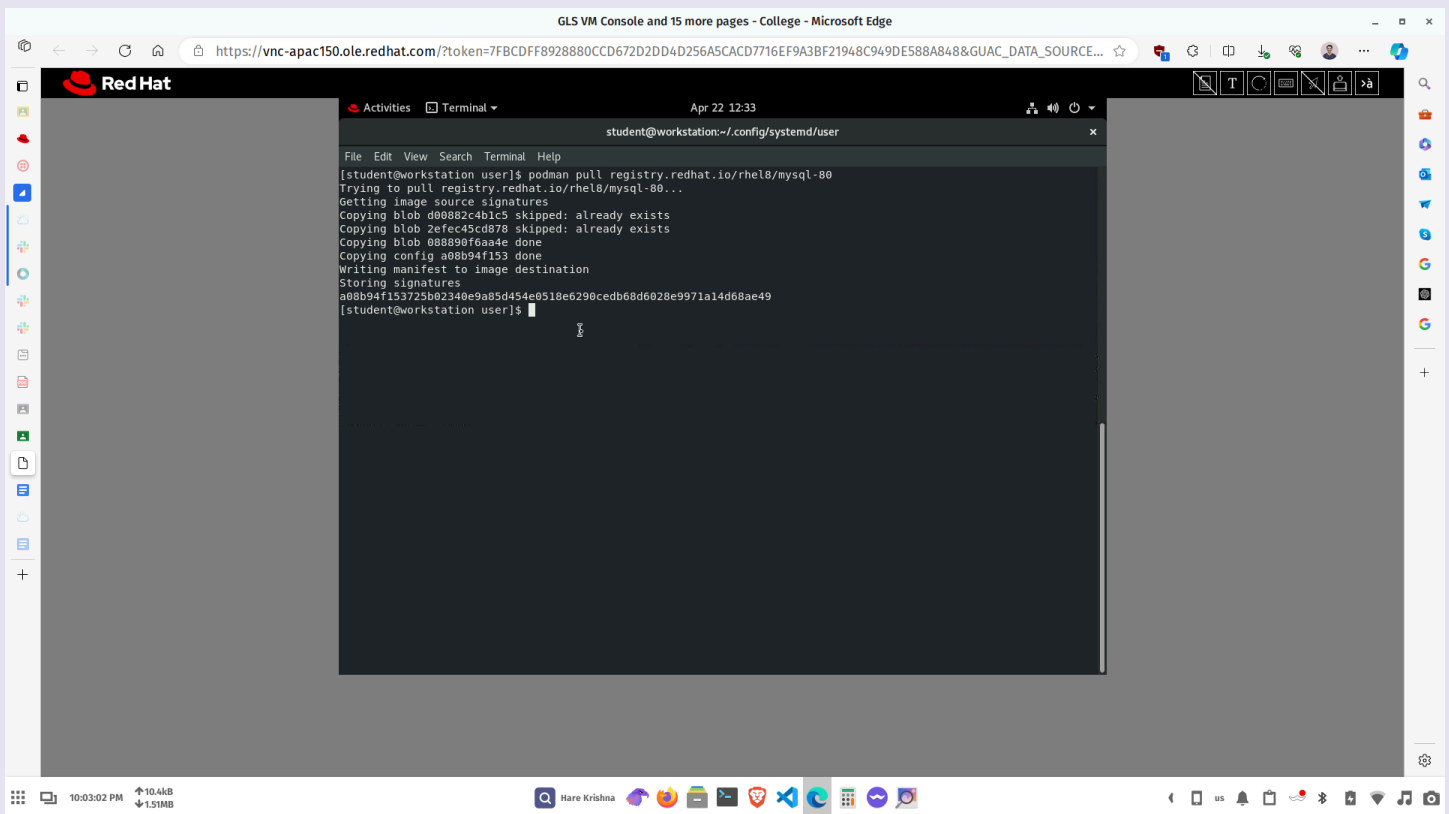
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2) Task 2:

- Create a container mysql-server from an image mysql on server a from registry
- perform the port forwarding
- create a database by your name
- create a table having the student details

Steps and Screenshots :

1. Pull the mysql image from registry



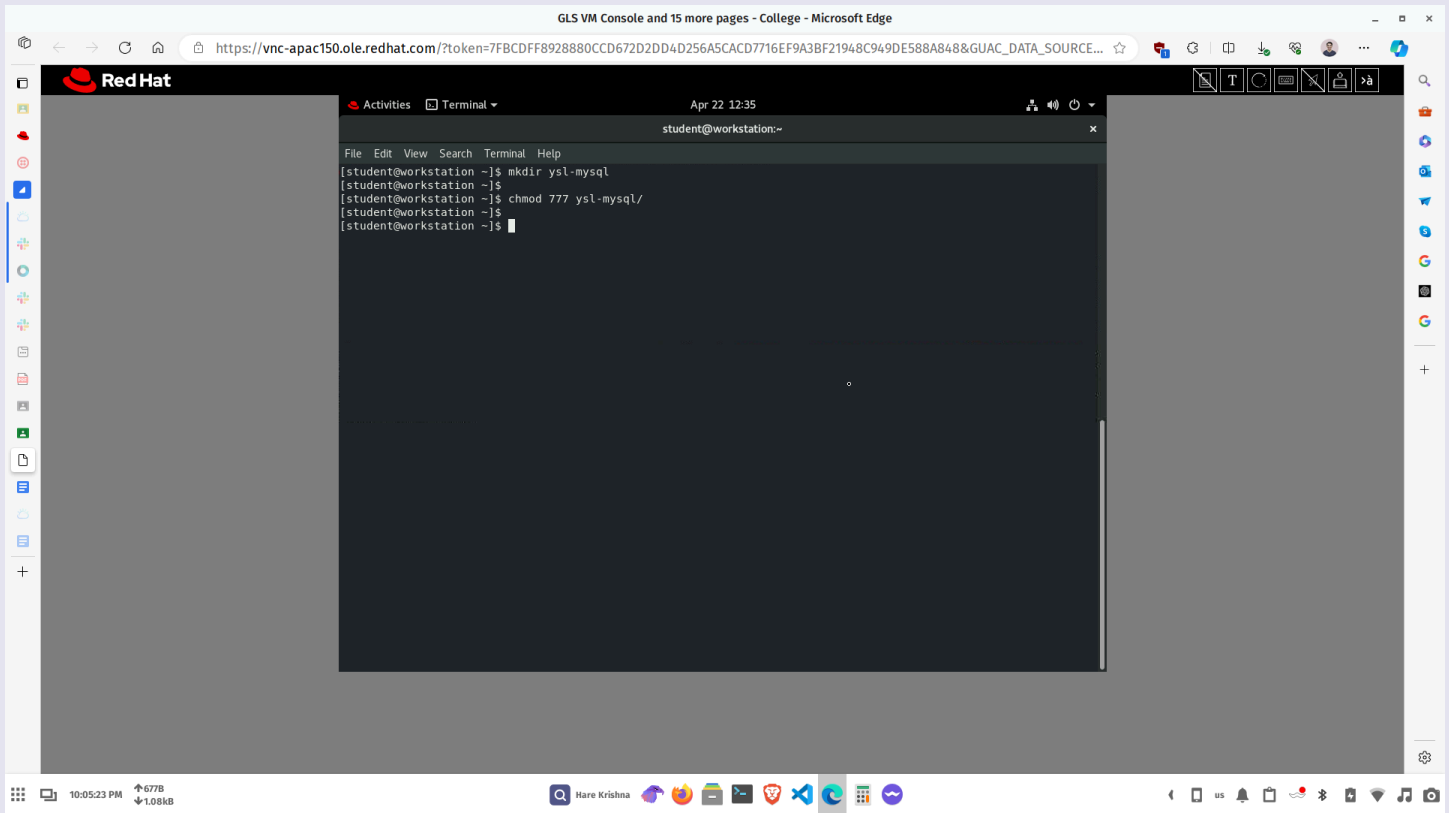
The screenshot shows a Red Hat VM console window titled "GLS VM Console and 15 more pages - College - Microsoft Edge". The terminal window is titled "student@workstation:~/config/systemd/user" and shows the command `podman pull registry.redhat.io/rhel8/mysql-80` being executed. The output of the command is as follows:

```
[student@workstation user]$ podman pull registry.redhat.io/rhel8/mysql-80
Trying to pull registry.redhat.io/rhel8/mysql-80...
Getting image source signatures
Copying blob d00882c4b1c5 skipped: already exists
Copying blob 2efec45cd878 skipped: already exists
Copying blob 008890f6aade done
Copying config a08b94f153 done
Writing manifest to image destination
Storing signatures
a08b94f153725b02340e9a85d454e0518e6290cedb68d6028e9971a14d608ae49
[student@workstation user]$
```

Command : ***podman pull registry.redhat.io/rhel8/mysql-80***

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2. Create the directory for mounting mysql data on host

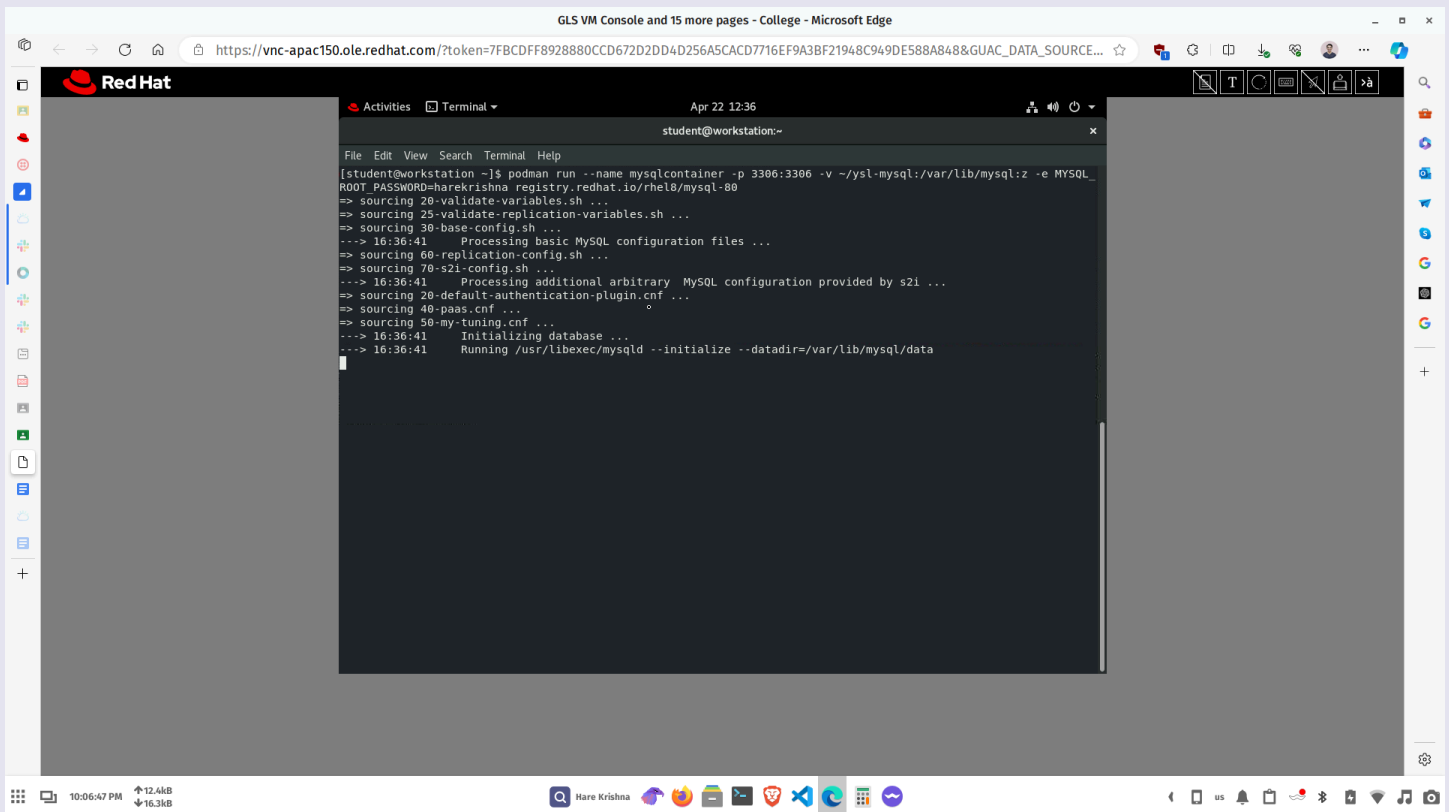


Commands :

- ***mkdir ysl-mysql***
- ***chmod 777 ysl-mysql*** (to give all r,w,x permissions to user, group and others)

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3. Run the mysql container with port forwarding and persistent mount and using option -e specify root password to set and use



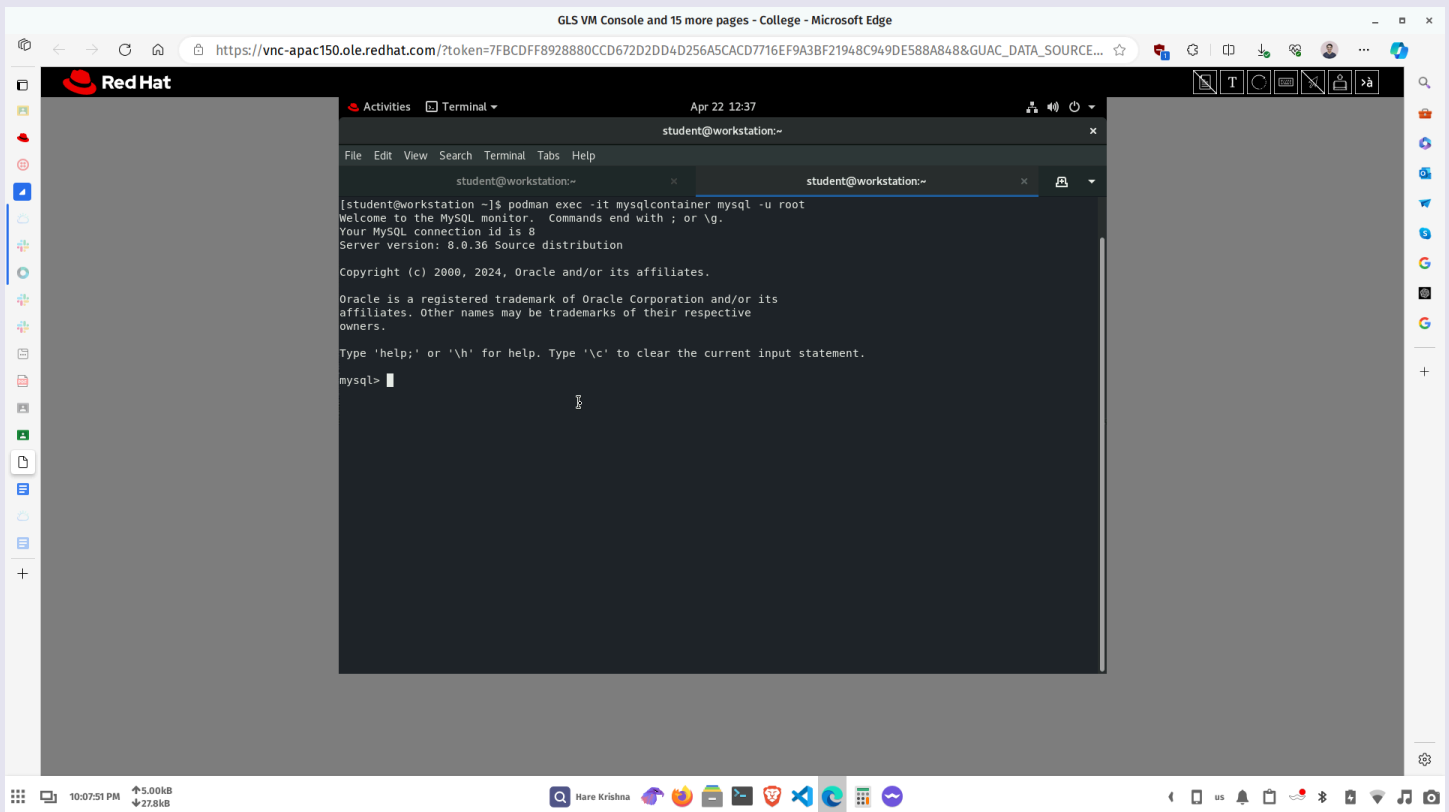
The screenshot shows a Red Hat VM console window titled "GLS VM Console and 15 more pages - College - Microsoft Edge". The terminal window displays the following command and output:

```
[student@workstation ~]$ podman run --name mysqlcontainer -p 3306:3306 -v /ysl-mysql:/var/lib/mysql:z -e MYSQL_ROOT_PASSWORD=harekrishna registry.redhat.io/rhel8/mysql-80
=> sourcing 20-validate-variables.sh ...
=> sourcing 25-validate-replication-variables.sh ...
=> sourcing 30-base-config.sh ...
--> 16:36:41 Processing basic MySQL configuration files ...
=> sourcing 60-replication-config.sh ...
=> sourcing 70-s2i-config.sh ...
--> 16:36:41 Processing additional arbitrary MySQL configuration provided by s2i ...
=> sourcing 20-default-authentication-plugin.cnf ...
=> sourcing 40-paas.cnf ...
=> sourcing 50-my-tuning.cnf ...
--> 16:36:41 Initializing database ...
--> 16:36:41 Running /usr/libexec/mysqld --initialize --datadir=/var/lib/mysql/data
```

Command : ***podman run --name mysqlcontainer -p 3306:3306 -v:/ysl-mysql:/var/lib/mysql:z -e MYSQL_ROOT_PASSWORD=harekrishna registry.redhat.io/rhel8/mysql-80***

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4. Now, as it was running in the terminal natively, in another tab or window, run `mysql` command in container and use interactive mode using `-it` option



The screenshot shows a Red Hat VM console window titled "GLS VM Console and 15 more pages - College - Microsoft Edge". The terminal window displays the following output:

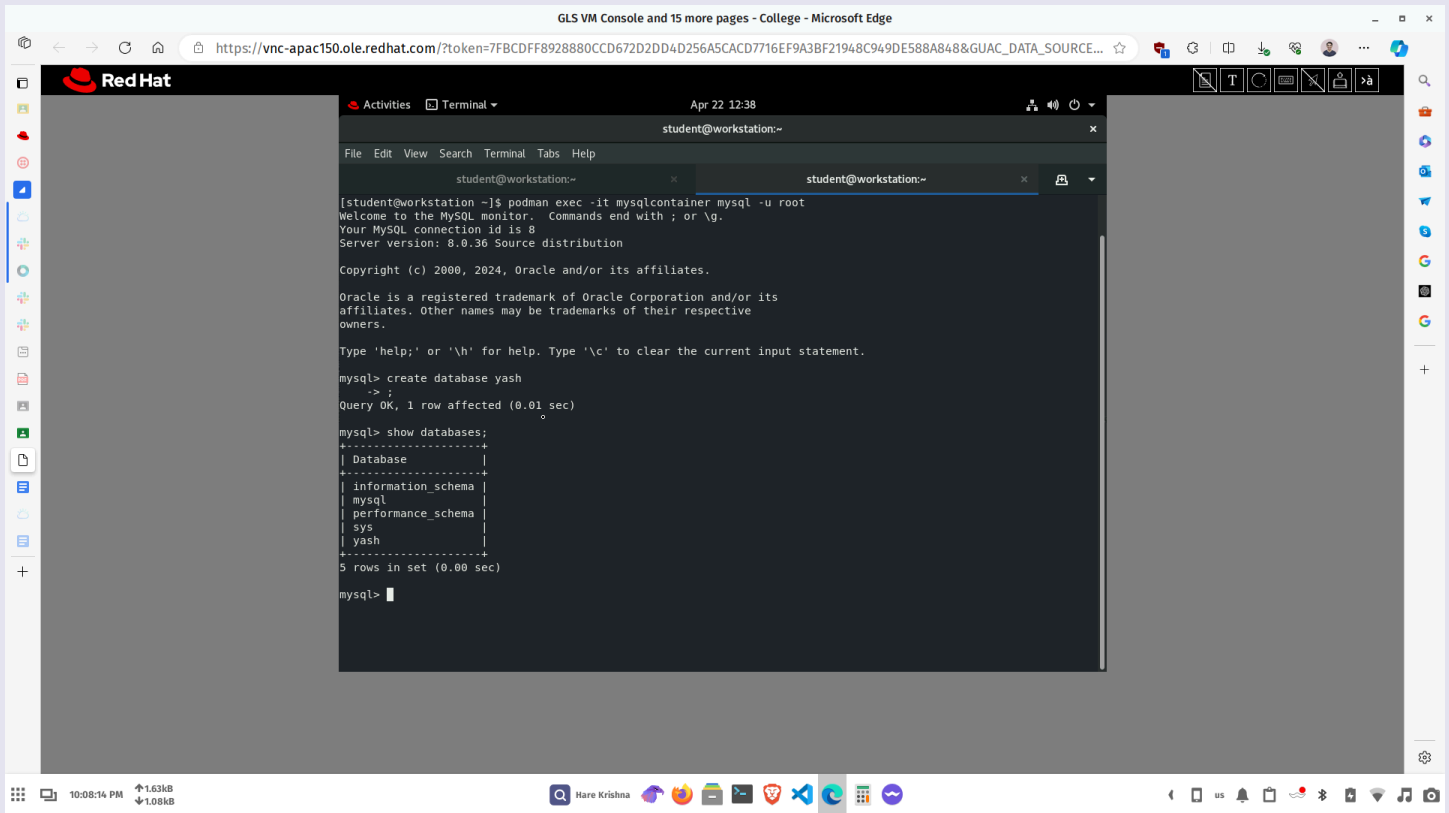
```
student@workstation:~  
[student@workstation ~]$ podman exec -it mysqlcontainer mysql -u root  
Welcome to the MySQL monitor.  Commands end with ; or \g.  
Your MySQL connection id is 8  
Server version: 8.0.36 Source distribution  
  
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Oracle is 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>
```

Command : ***podman exec -it mysqlcontainer mysql -u root***

(Here, `mysql -u root` is the command to run in container)

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5. Create a database



The screenshot shows a Red Hat VM console window titled "GLS VM Console and 15 more pages - College - Microsoft Edge". The terminal window is titled "student@workstation:~" and shows the following commands and output:

```
[student@workstation ~]$ podman exec -it mysqlcontainer mysql -u root
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.36 Source distribution

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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 yash
> ;
Query OK, 1 row affected (0.01 sec)

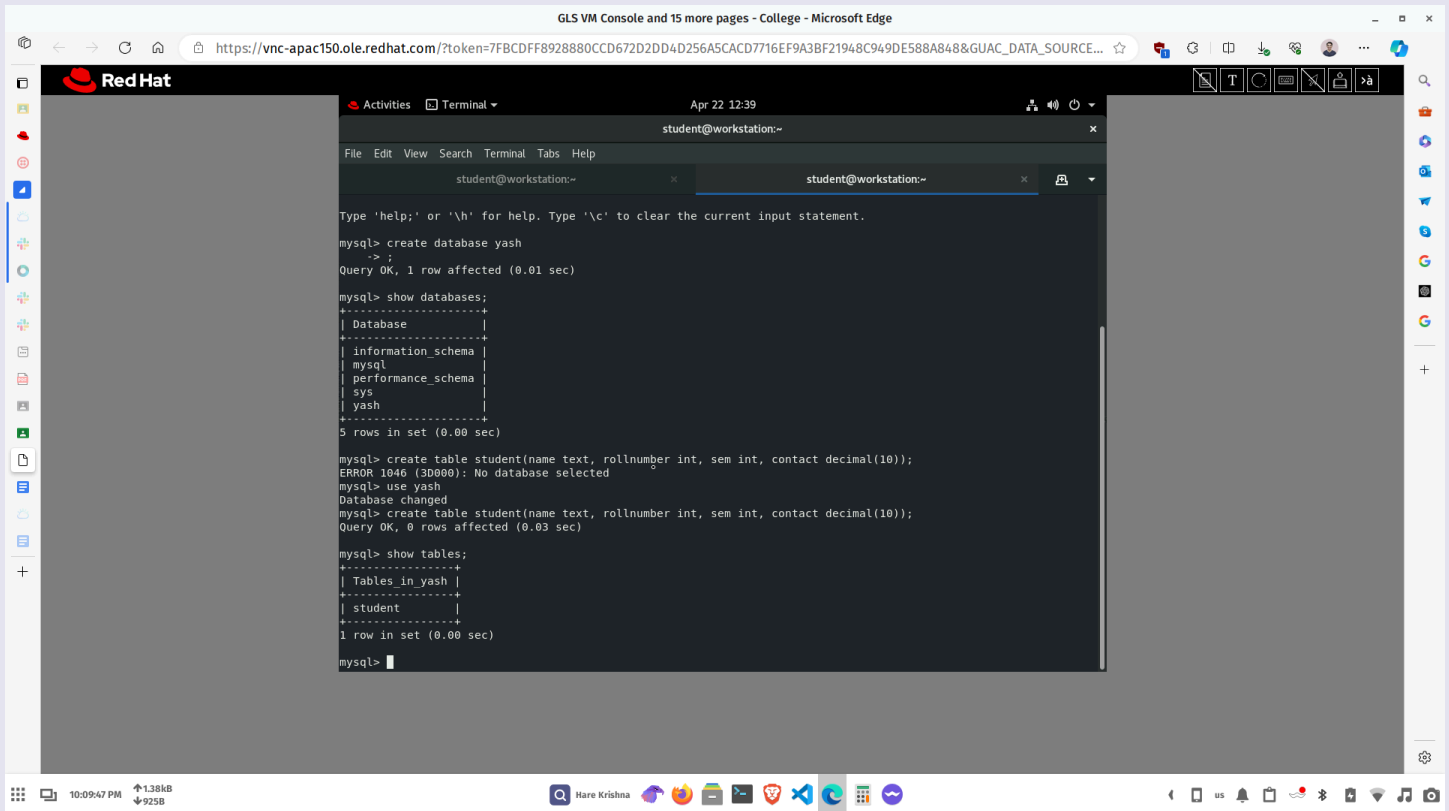
mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
| yash |
+-----+
5 rows in set (0.00 sec)

mysql>
```

The terminal window is part of a Red Hat desktop environment. The top bar shows the Red Hat logo and the title "GLS VM Console and 15 more pages - College - Microsoft Edge". The terminal window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Tabs". The bottom status bar shows the time "10:08:14 PM", network status "↑1.63kB", and various system icons.

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6. Create a student table to store student details



The screenshot shows a Red Hat VM console window titled "GLS VM Console and 15 more pages - College - Microsoft Edge". The terminal window is titled "student@workstation:~" and shows the following commands and output:

```
mysql> create database yash
-> ;
Query OK, 1 row affected (0.01 sec)

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
| yash |
+-----+
5 rows in set (0.00 sec)

mysql> create table student(name text, rollnumber int, sem int, contact decimal(10));
ERROR 1046 (30000): No database selected
mysql> use yash
Database changed
mysql> create table student(name text, rollnumber int, sem int, contact decimal(10));
Query OK, 0 rows affected (0.03 sec)

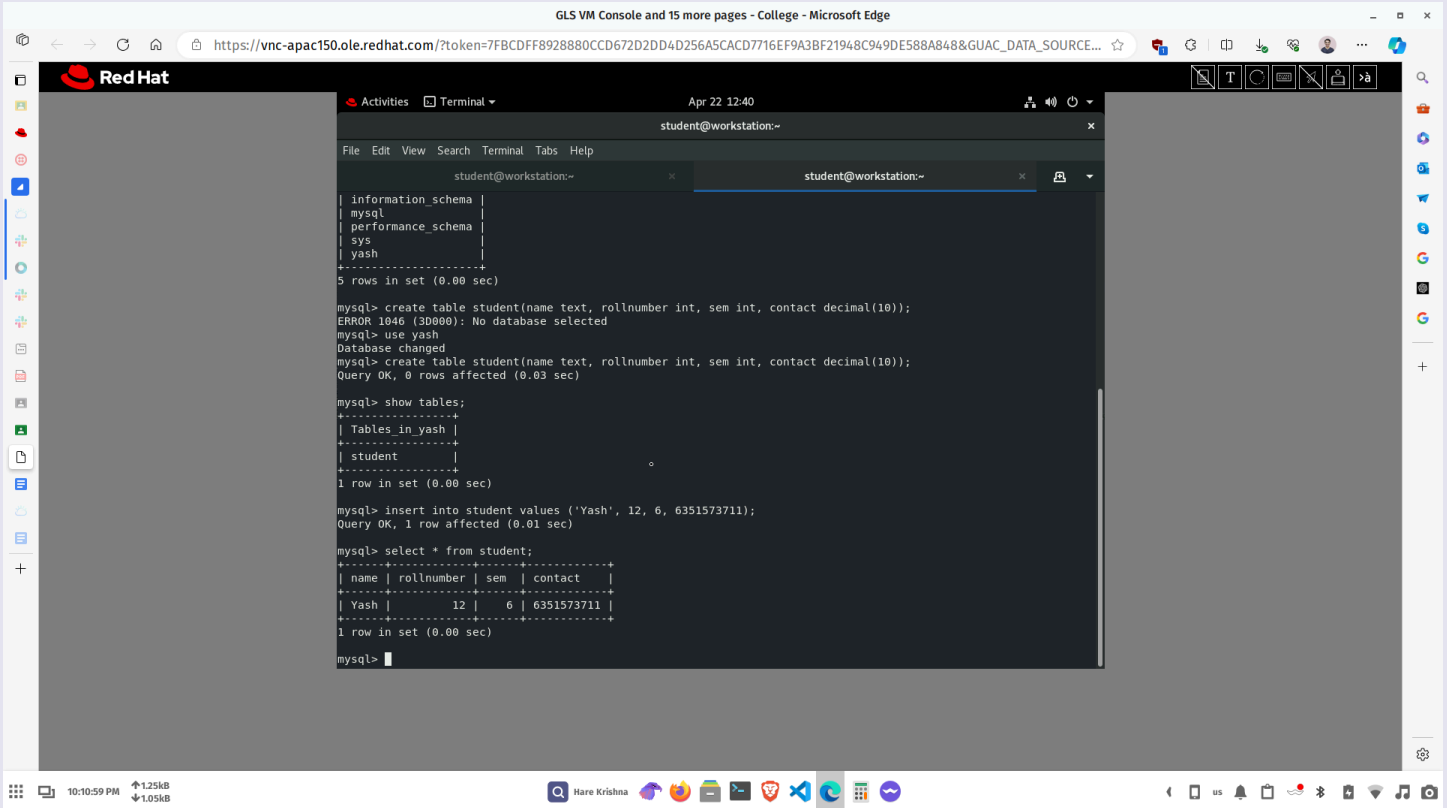
mysql> show tables;
+-----+
| Tables_in_yash |
+-----+
| student |
+-----+
1 row in set (0.00 sec)

mysql>
```

The terminal window is part of a Red Hat environment, as indicated by the "Red Hat" logo in the top left corner. The window title bar shows "GLS VM Console and 15 more pages - College - Microsoft Edge". The terminal window has a menu bar with "File", "Edit", "View", "Search", "Terminal", "Tabs", and "Help". The terminal window also has a status bar at the bottom showing "10:09:47 PM", "1.38kB", and "925B".

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7. Insert some values and check if working successfully



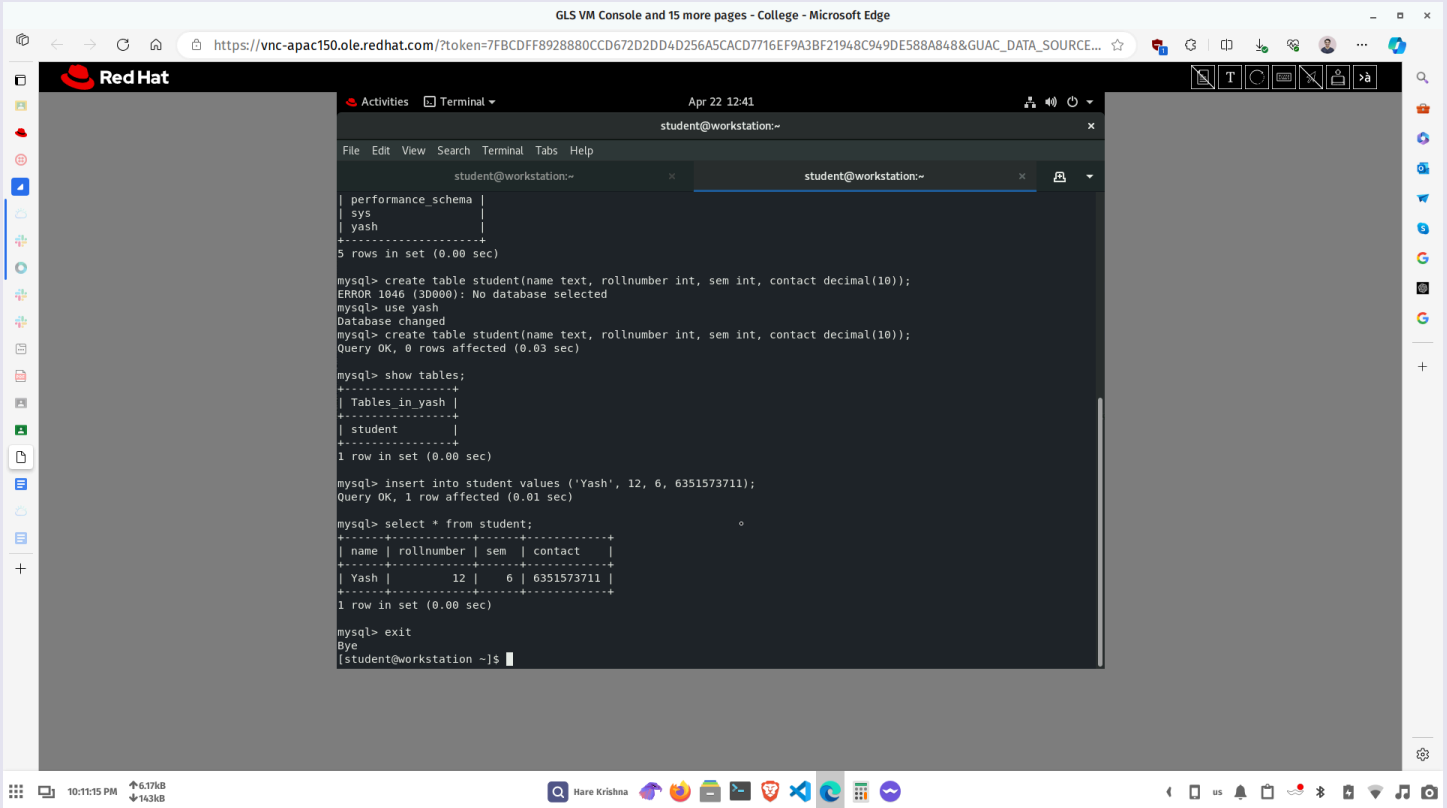
The screenshot shows a Red Hat VM console window titled "GLS VM Console and 15 more pages - College - Microsoft Edge". The terminal window is titled "student@workstation:~" and shows the following commands and output:

```
student@workstation:~  
mysql> show databases;  
+-----+  
| information_schema |  
| mysql               |  
| performance_schema |  
| sys                 |  
| yash                 |  
+-----+  
5 rows in set (0.00 sec)  
  
mysql> create table student(name text, rollnumber int, sem int, contact decimal(10));  
ERROR 1046 (3D000): No database selected  
mysql> use yash  
Database changed  
mysql> create table student(name text, rollnumber int, sem int, contact decimal(10));  
Query OK, 0 rows affected (0.03 sec)  
  
mysql> show tables;  
+-----+  
| Tables_in_yash |  
+-----+  
| student        |  
+-----+  
1 row in set (0.00 sec)  
  
mysql> insert into student values ('Yash', 12, 6, 6351573711);  
Query OK, 1 row affected (0.01 sec)  
  
mysql> select * from student;  
+-----+  
| name | rollnumber | sem | contact |  
+-----+  
| Yash |         12 |   6 | 6351573711 |  
+-----+  
1 row in set (0.00 sec)  
  
mysql>
```

The bottom status bar shows the time as 10:10:59 PM, network activity (1.25kB up, 1.05kB down), and system icons for Hare Krishna, Firefox, and other applications.

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8. Type exit to exit from running command interactively in container



The screenshot shows a terminal window titled "Red Hat" with a URL bar at the top. The terminal displays the following commands and output:

```
student@workstation:~  
File Edit View Search Terminal Tabs Help  
student@workstation:~  
| performance_schema |  
| sys |  
| yash |  
+-----+  
5 rows in set (0.00 sec)  
  
mysql> create table student(name text, rollnumber int, sem int, contact decimal(10));  
ERROR 1046 (3D000): No database selected  
mysql> use yash  
Database changed  
mysql> create table student(name text, rollnumber int, sem int, contact decimal(10));  
Query OK, 0 rows affected (0.03 sec)  
  
mysql> show tables;  
+-----+  
| Tables_in_yash |  
+-----+  
| student |  
+-----+  
1 row in set (0.00 sec)  
  
mysql> insert into student values ('Yash', 12, 6, 6351573711);  
Query OK, 1 row affected (0.01 sec)  
  
mysql> select * from student;  
+-----+  
| name | rollnumber | sem | contact |  
+-----+  
| Yash | 12 | 6 | 6351573711 |  
+-----+  
1 row in set (0.00 sec)  
  
mysql> exit  
Bye  
[student@workstation ~]$
```

The terminal window is part of a VNC session titled "GLS VM Console and 15 more pages - College - Microsoft Edge". The bottom status bar shows the time as 10:11:15 PM and network usage as 6.17KB up and 14.3KB down.