Question 1:

1) User Identity verification:

```
yashwanthnalla@192 Question_1 % id
uid=501(yashwanthnalla) gid=20(staff) groups=20(staff),12(everyone),61(localaccounts),79(_appserverusr),80(admin),81(_appserveradm),98(_lpadmin),701(com.apple.sharepoint.group.1),33(_appstore),100(_lpoperator),204(_developer),250(_analyticsusers),395(com.apple.access_ftp),398(com.apple.access_screensharing),399(com.apple.access_ssh),400(com.apple.access_remote_ae)
yashwanthnalla@192 Question_1 %
```

The ‘id’ command displays the current user’s identity (uid), primary group (gid), and the list of all groups the user belongs to, verifying permissions.

2) Workspace validation

```
yashwanthnalla@192 Question_1 % pwd
/Users/yashwanthnalla/BITS_Pilani/Subjects/1-2/1-2_CLI_and_Scripting/GA-Module(1-4)/Question_1
yashwanthnalla@192 Question_1 %
```

‘pwd’ command prints the present working directory, showing where I am currently located in the filesystem.

```
yashwanthnalla@192 Question_1 % ls -l
total 0
yashwanthnalla@192 Question_1 %
```

‘ls-l’ provides a detailed list of files and directories, including permissions and modification dates.

3) Environment confirmation file:

```
yashwanthnalla@192 Question_1 % echo "Linux user environment verified" > user_info.txt
yashwanthnalla@192 Question_1 %
```

user_info.txt

Question_1/user_info.txt

```
1   Linux user environment verified
2
```

This command creates a file named user_info.txt and writes the message -”Linux user environment verified” in the file.

4) **File Integrity Check:**

```
yashwanthnalla@192 Question_1 % wc -m user_info.txt
      32 user_info.txt
yashwanthnalla@192 Question_1 %
```

The ‘wc’ command (word count) with the -m switch counts and displays the number of characters in the file, verifying the file content length.

5) **Learning the Tools:**

```
yashwanthnalla@192 Question_1 % man mkdir
```

```
MKDIR(1)                          General Commands Manual                          MKDIR(1)

NAME
     mkdir – make directories

SYNOPSIS
     mkdir [-pv] [-m mode] directory_name ...

DESCRIPTION
     The mkdir utility creates the directories named as operands, in the order specified, using mode
     “rwxrwxrwx” (0777) as modified by the current umask(2).

     The options are as follows:

     -m mode         Set the file permission bits of the final created directory to the specified mode.  The
                     mode argument can be in any of the formats specified to the chmod(1) command.  If a
                     symbolic mode is specified, the operation characters ‘+’ and ‘-’ are interpreted
                     relative to an initial mode of “a=rwx”.

     -p              Create intermediate directories as required.  If this option is not specified, the full
                     path prefix of each operand must already exist.  On the other hand, with this option
                     specified, no error will be reported if a directory given as an operand already exists.
                     Intermediate directories are created with permission bits of “rwxrwxrwx” (0777) as
                     modified by the current umask, plus write and search permission for the owner.

     -v              Be verbose when creating directories, listing them as they are created.

     The user must have write permission in the parent directory.
:
```

```
yashwanthnalla@192 Question_1 % mkdir -v test
test
yashwanthnalla@192 Question_1 %
```

I accessed the manual for ‘mkdir’, using the ‘man mkdir’ command. A useful option I found is ‘-v’ (verbose), which prints a message for each directory created, it will help verify that the operation was successful.

6) **Home Directory Inspection:**

```
yashwanthnalla@192 Question_1 % ls -l ~
total 336
drwxr-x---    2 yashwanthnalla  staff      64  1 May  2024 Adlm
drwxr-xr-x    5 yashwanthnalla  staff     160  1 Mar  2025 Applications
drwxr-xr-x@   6 yashwanthnalla  staff     192  4 Dec 12:40 BITS_Pilani
drwxr-xr-x   10 yashwanthnalla  staff     320 11 Jun  2025 Class
drwxr-xr-x   11 yashwanthnalla  staff     352 21 May  2025 Core
```

I used ‘ls’ with the tilde (~) symbol, which represents the user’s home directory. The output is sorted alphabetically by default, satisfying the requirement.

7) **Log Investigation:**

```
yashwanthnalla@192 Question_1 % echo "admin access" > log.txt
yashwanthnalla@192 Question_1 % grep "admin" log.txt
admin access
yashwanthnalla@192 Question_1 %
```

First I have created and added text (“admin access”) using echo “admin access” > log.txt, Because we cannot search a file that does not exist.
The ‘grep’ command searches through log.txt for the string ‘admin’ and prints only the lines where that string appears.

8) **System Information Check:**

```
yashwanthnalla@192 Question_1 % uname -r
25.2.0
yashwanthnalla@192 Question_1 %
```

The ‘uname’ command with the ‘-r’ flag outputs the specific release version of the Linux kernel currently running on the system.

9) Network connectivity Test:

```
yashwanthnalla@192 Question_1 % ping -c 4 www.google.com
PING www.google.com (142.250.192.4): 56 data bytes
64 bytes from 142.250.192.4: icmp_seq=0 ttl=116 time=26.972 ms
64 bytes from 142.250.192.4: icmp_seq=1 ttl=116 time=35.095 ms
64 bytes from 142.250.192.4: icmp_seq=2 ttl=116 time=27.373 ms
64 bytes from 142.250.192.4: icmp_seq=3 ttl=116 time=27.021 ms

--- www.google.com ping statistics ---
4 packets transmitted, 4 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 26.972/29.115/35.095/3.456 ms
yashwanthnalla@192 Question_1 %
```

I sent 4 ICMP packets using '-c 4' to Google's server to verify that the system can reach external networks and receive a response.

10) System Health Awareness:

```
yashwanthnalla@192 Question_1 % uptime
10:55  up 10 days, 11:45, 3 users, load averages: 1.83 1.93 1.91
yashwanthnalla@192 Question_1 %
```

The 'uptime' command shows how long the system has been running, the number of logged-in users and the system load averages.