a) Enable Authentication for Single-User Mode on Linux

1. Edit the `/etc/security/authconfig` file: This file controls authentication settings for various system services, including single-user mode.

   Bash

   ```
   sudo nano /etc/security/authconfig
   ```

2. Modify the relevant options:
   - Uncomment and set the desired authentication methods:

   ```
   USE_PAM="yes"
   USE_PAM_AUTH="yes"
   ```

3. Run `authconfig` :

   Bash

   ```
   sudo authconfig
   ```

4. Reboot the system: For the changes to take effect in single-user mode, a system reboot is usually required.

   Bash

   ```
   sudo reboot
   ```

b) Find the Subnet Mask and Physical Address of a Machine in Unix/Linux

- Subnet Mask:
  - `ip addr show` : This command displays detailed network interface information, including the subnet mask.

    Bash

    ```
    ip addr show eth0 | grep "inet "
    ```

    - Replace `eth0` with the actual interface name (e.g., `enp0s3`).
- Physical Address (MAC Address):
  - `ip link show` :

Bash

```
ip link show eth0 | grep "link/ether"
```

Verifying Results:

- Subnet Mask:
  - After running the `ip addr show` command, check the output for the line containing the IP address of the interface. The subnet mask will be displayed next to the IP address, typically in CIDR notation (e.g., 192.168.1.100/24).
- Physical Address (MAC Address):
  - The `ip link show` command will display the MAC address in the format "xx:xx:xx:xx:xx:xx".

Note:

- These commands provide the most common and reliable methods for obtaining subnet masks and MAC addresses in modern Linux systems.
- The specific interface names and output formats may vary slightly depending on the Linux distribution and system configuration.