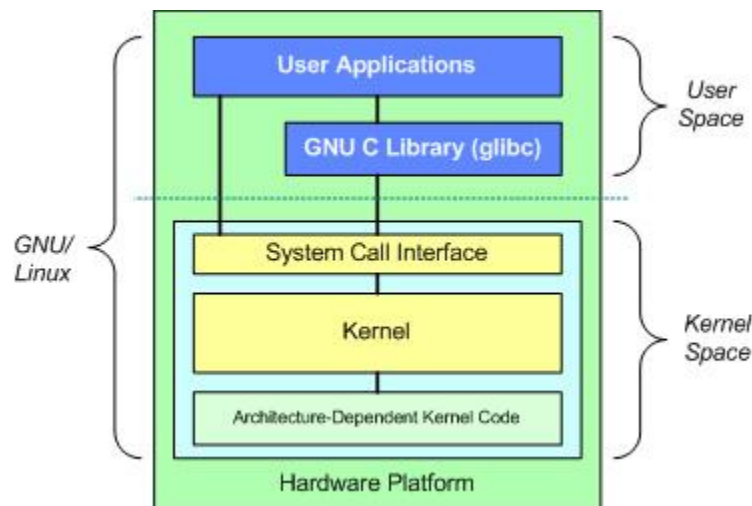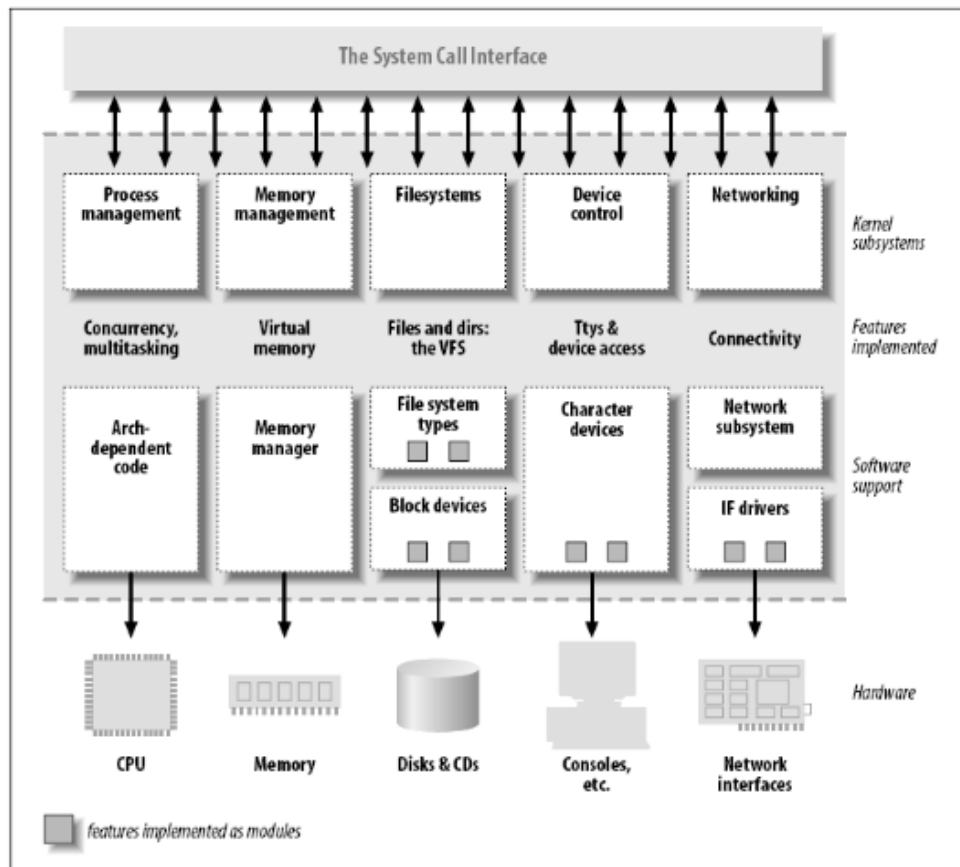```
Setting up gnome-shell-extension-ubuntu-dock (72~ubuntu5.22.04.3) ...
Setting up libreoffice-gnome (1:7.3.7-0ubuntu0.22.04.10) ...
Setting up libreoffice-impress (1:7.3.7-0ubuntu0.22.04.10) ...
Setting up libreoffice-base-core (1:7.3.7-0ubuntu0.22.04.10) ...
Setting up python3-uno (1:7.3.7-0ubuntu0.22.04.10) ...
Setting up libreoffice-ogltrans (1:7.3.7-0ubuntu0.22.04.10) ...
Setting up libreoffice-calc (1:7.3.7-0ubuntu0.22.04.10) ...
Setting up libreoffice-writer (1:7.3.7-0ubuntu0.22.04.10) ...
Setting up ubuntu-desktop-minimal (1.481.4) ...
Setting up ubuntu-desktop (1.481.4) ...
Processing triggers for desktop-file-utils (0.26-1ubuntu3) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu3) ...
Processing triggers for libc-bin (2.35-0ubuntu3.10) ...
Processing triggers for ufw (0.36.1-4ubuntu0.1) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for dbus (1.12.20-2ubuntu4.1) ...
Processing triggers for shared-mime-info (2.1-2) ...
Processing triggers for install-info (6.8-4build1) ...
Processing triggers for mailcap (3.70+nmu1ubuntu1) ...
Processing triggers for fontconfig (2.13.1-4.2ubuntu5) ...
Processing triggers for ca-certificates (20240203~22.04.1) ...
Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...
done.
Processing triggers for linux-image-6.8.0-79-generic (6.8.0-79.79~22.04.1) ...
/etc/kernel/postinst.d/initramfs-tools:
update-initramfs: Generating /boot/initrd.img-6.8.0-79-generic
/etc/kernel/postinst.d/zz-update-grub:
Sourcing file `/etc/default/grub'
Sourcing file `/etc/default/grub.d/init-select.cfg'
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-6.8.0-79-generic
Found initrd image: /boot/initrd.img-6.8.0-79-generic
Found linux image: /boot/vmlinuz-6.8.0-78-generic
Found initrd image: /boot/initrd.img-6.8.0-78-generic
Found linux image: /boot/vmlinuz-6.8.0-40-generic
Found initrd image: /boot/initrd.img-6.8.0-40-generic
Found memtest86+ image: /boot/memtest86+.elf
Found memtest86+ image: /boot/memtest86+.bin
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
done
Processing triggers for initramfs-tools (0.140ubuntu13.5) ...
update-initramfs: Generating /boot/initrd.img-6.8.0-79-generic
elsayed@SIC:~$ uname -r
6.8.0-78-generic
elsayed@SIC:~$ whoami
elsayed
elsayed@SIC:~$ date
30 Ø£Ø°Ø§ , 2025 EEST 11:32:50 ù

elsayed@SIC:~$ mkdir -p /home/elsayed/iot_logger/{loga,scripts,data}
elsayed@SIC:~$
```

# 1. Linux Architecture Layers

## 2. Purpose of Key Directories

- / → Root directory, the starting point of the filesystem.

- /bin → Essential user binaries (e.g., ls, cp, cat) available for all users.

- /sbin → System binaries, mainly for administration (e.g., fdisk, shutdown).

- /usr → User-related programs, libraries, and documentation.

- /etc → Configuration files for the system and applications.

- /var → Variable data like logs, caches, spools, temporary files

## 3. Why Linux Treats Everything as a File

Linux follows the philosophy of "everything is a file." Devices (like USBs, disks), processes, sockets, and pipes are all represented as files.
This unification simplifies system design—programs can interact with hardware and software using the same simple file operations (open, read, write, close).

## 4. Program vs. Process

- **Program** → A static executable file stored on disk (e.g., /bin/ls).

- **Process** → A running instance of a program in memory with its own state, resources, and Process ID (PID).

Example: The file /bin/bash is a **program**. When you open a terminal, each shell you start is a new **process** running that program.