

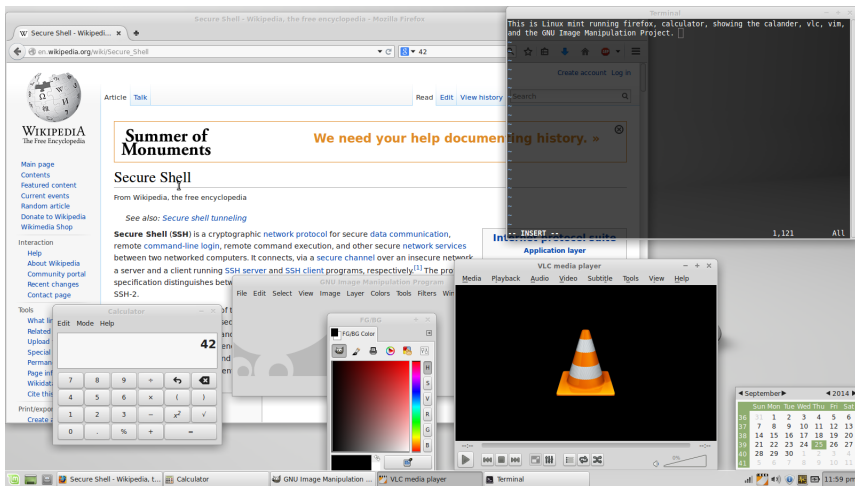
**Textbook:** Operating System Concepts (9th ed.) — *Silberschatz, Galvin, Gagne*

## Other references:

- 1 [Vahalia] Unix Internals The New Frontiers — *Uresh Vahalia* (Pearson Education Asia/LPE)
- 2 [Bach] The Design of the UNIX Operating System — *M.J. Bach* (Prentice Hall)
- 3 [ULK] Understanding the Linux Kernel — *Bovet, Cesati* (O'Reilly)
- 4 [LKD] Linux Kernel Development — *Love* (Addison-Wesley)
- 5 [APUE] Advanced Programming in the UNIX Environment — *W. Richard Stevens* (Addison-Wesley), 1992.
- 6 [UNP] UNIX Network Programming — *W. Richard Stevens* (Prentice Hall), 1990.

**Slides:** Available from <http://www.isical.ac.in/~mandar/courses.html#os>

# What does an OS do?



# What does an OS do?

## **Incomplete list of random things that an OS takes care of**

- Multi-tasking: run multiple programs 'simultaneously' / concurrently
- Operate various devices
- Protection/security

# Why do we need an OS?

## ■ *Convenience*

- mediates access to hardware by providing convenient abstractions (not easy to use hardware directly)
- provides environment + services needed to run user programs in a convenient way

## ■ *Resource sharing* between multiple users / processes

- *Protection/security*: prevent different users / processes from interfering with each other

## ■ *Communication*: coordinate operation of different processes

# What is an OS?

## Definition

Software that manages a computer's hardware resources for its users and their applications

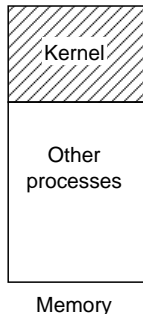
# What is an OS?

a library of functions + set of programs

## Definition

Software that manages a computer's hardware resources for its users and their applications

- Kernel: core library that provides functions for basic operations (e.g., process creation / destruction) + interface to hardware via **API** (Application Programming Interface)
- Processes / programs (we will distinguish between these terms later)
  - system processes – daemons/servers (httpd, lpd, sendmail, etc.)
  - user processes – shell, editor, compiler, utilities



# Things to manage

- CPU (processes)
- RAM (memory management)
- Hard discs (file systems)
- Keyboard, monitor (I/O devices)