1. What is an operating system?

* Manages hardware and resources
* Allow interaction with hardware

What is Unix?

* Family of operating systems
* Some popular Unix-based Oss: Oracle Solaris, FreeBSD, HP-UX, IBM AIX, Apple macOS

What is Linux?

* Family of Unix-like OS, usually specific distribution
* Original developed as an effort to create a free, open source Unix OS
* Features:
  + Free and open source
  + Most secure
  + Multi-user
  + Multitasking
  + Portable
* Usecases:
  + Smartphone like android systems
  + Supercomputers
  + Data centers and cloud services
  + PCs

1. Linux Distributions
2. Definition

* Specific flavor of Linux OS
* Also referred to as Distro
* Linux kernel is the core component
* Hundreds of Linux distros

1. Linux distro differences

* System utilities: include a unique set of default utilities that are part of operating systems
* Has own GUI
* Support specific set of commands
* Provide differing levels of support:
  + Developed by Community or maintained enterprise
  + LTS vs rolling release
* Linux distros:
  + Debian
  + Ubuntu: Debian-based, dev and mana by canonical
  + Red hat linux: Stable reliable, fully open source, mana by red hat
  + Fedora
  + SUSE Enterprise

1. Linux architecture
2. distinct layers
3. UI:
   * Allow user to interact with machine
   * GUI
   * Tasks: using web browser to send mails, listen to music, …
4. Application:
   * System daemon: compiler, programming languages
   * Shells
   * User apps: browsers, text editors,…
   * Tools
5. Operating system: Controls the jobs and programs vital to health and stability

Functions:

+ Assign software to users

+ Helps detect errors and prevent failures

+ Perform files management

1. Kernel: Bridge between apps and hardware

Key jobs:

+ Memory management

+ Process management

+ Device drivers

+ Security

1. Hardware: Consist physical or electronic devices on PC

Includes:

+ CPU: executing most calculations.

+ RAM: hold the temporary information applications need to run

+ Storage

+ Screen

+ USB

1. Linux filesystem

* Collections of files
* Begins at root directory (/)
* Tree structure
* /bin: exists directly below root directory
* /usr: contains user programs
* /home: personal file
* /boot
* A screenshot of a computer

  Description automatically generated/media

1. Linux Terminal Overview
2. Linux shell

* The shell is an OS-level application that interprets command
* Shells: bash, zsh

1. Terminal

* Application used to interact with the shell
* Enter commands and receive output from them
* A diagram of a shell

  Description automatically generatedHow cmd run?
* Notation:

+ ~ Home directory

+ / Root directory

+ .. Parent directory

+ . current directory

+ ls to list all the contents of a directory

+ pwd to print the path name to a present working directory