Devices and Tasks

- desktops
- laptops
- tablets
- smartphones
- music players
- e-book readers
- game consoles
- navigation devices

- surf the Internet
- send / receive e-mail
- listen to music
- read books
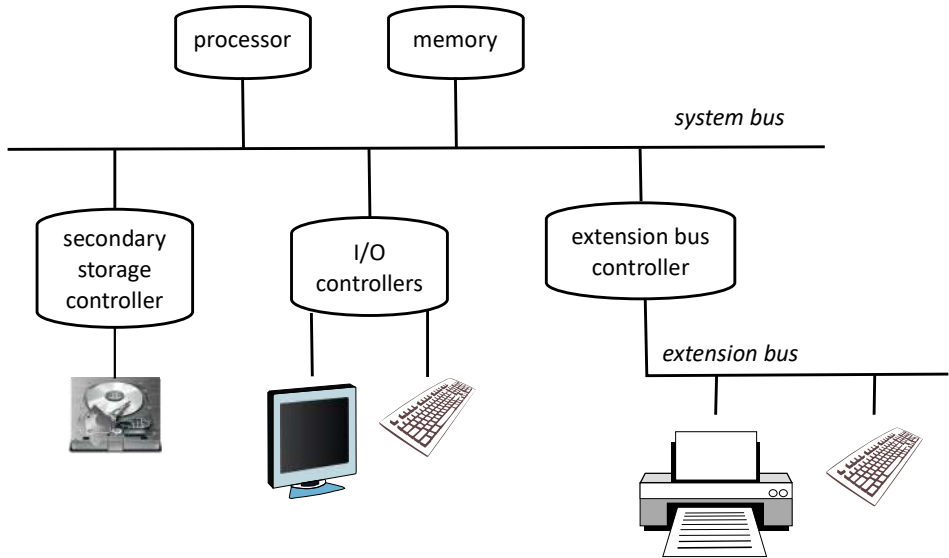- prepare documents
- play games
- find your way

Computer

- a device that processes information

- it can be used for different purposes
- depending on the program running on it

- a device that processes information
  under the control of a changeable program

Components

- physical parts: *hardware*
- programs: *software*

Architecture

- processor
- memory

system bus

- secondary storage controller
- I/O controllers
- extension bus controller

extension bus

Processor

- *processor* runs the programs

- also called: Central Processing Unit - *CPU*

Memory

- *memory* contains running programs and data

- also called: Random Access Memory - *RAM*

- contents not persistent

Secondary Storage

- for persistence: secondary storage

- e.g. hard disks

- accessed via secondary storage controllers

System Bus

- components connected through a system bus
- transfer program and data between components

- when running a program: load
- secondary storage → memory

- to make changes permanent: save
- memory → secondary storage

Input/Output

- transfer data from/to outside world: *I/O*
- typical example: user interaction

- output: monitors
- input: keyboards, mice
- input/output: touchscreens

Peripheral Devices

- some devices are useful but not essential

- e.g. printers, webcams

- system bus gets extended

- current extension technology: USB

Operating System

- which component starts a program?
- *operating system* (O/S)

- O/S is itself software
- sits between hardware and applications
- manages resources

Multitasking

- run multiple programs at the same time

- physically not possible if only one CPU

- *time sharing*: quickly switch between programs

Resource Management

- make sure programs don't interfere

  with each other's resources

- memory, devices, …

Programming Interface

- O/S makes it easier to develop applications

- hides details of hardware

Popular O/Ss

- Unix: family of operating systems
- many variants: Linux, MacOS X, AIX, FreeBSD
- Linux distributions: Ubuntu, Fedora, Debian

- Windows

- mobile: iOS, Android (Linux)

Resource

- An abstract idea of an object to be handled

  - data

  - a computer

  - a program on a computer

  - a person or a thing

- A computer may identify

  - a name

  - a location

URI

- URI: Uniform resource identifier
  - URL: Uniform resource locator
  - URN: Uniform resource name

- The format of a URI

  URI = scheme:[//authority]path[?query][#fragment]

  authority = [userinfo@]host[:port]

Examples

https://sandikkaya@www.itu.edu.tr:1312/website
/?view=mainpage&language=en#top

urn:isbn:0-201-03801-3