



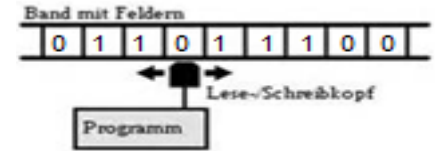
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IT Principles

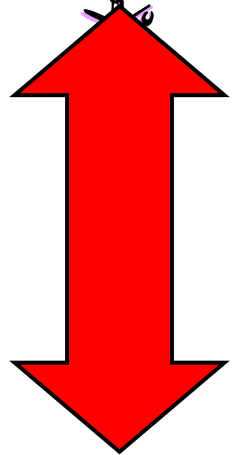
Introduction to the basics of computer science

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The Tradeoff



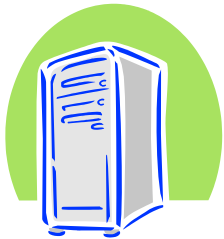
Needs, problems, questions, ...



????

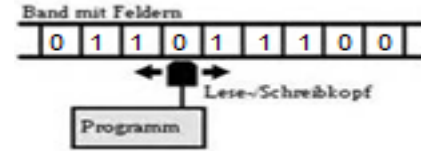
Communication problem

- How does a PC work?
- How to communicate with a PC?
- What is a PC able to do?



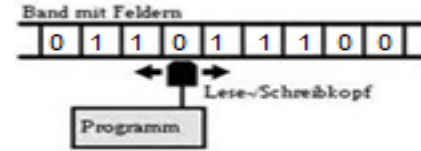
Works only with binary data (10010111)

Overview



- This first part covers
 - What computers are, how they work, and how they are used
 - Computer terminology
 - An overview of the history of computers
 - The basic types of computers in use today
 - An overview of networks and the Internet

What Is a Computer?



Computer

- A programmable, electronic device that accepts data, performs operations on that data, and stores the data or results as needed
- Computers follow instructions, called programs, which determine the tasks the computer will perform

What Is a Computer and What Does It Do?

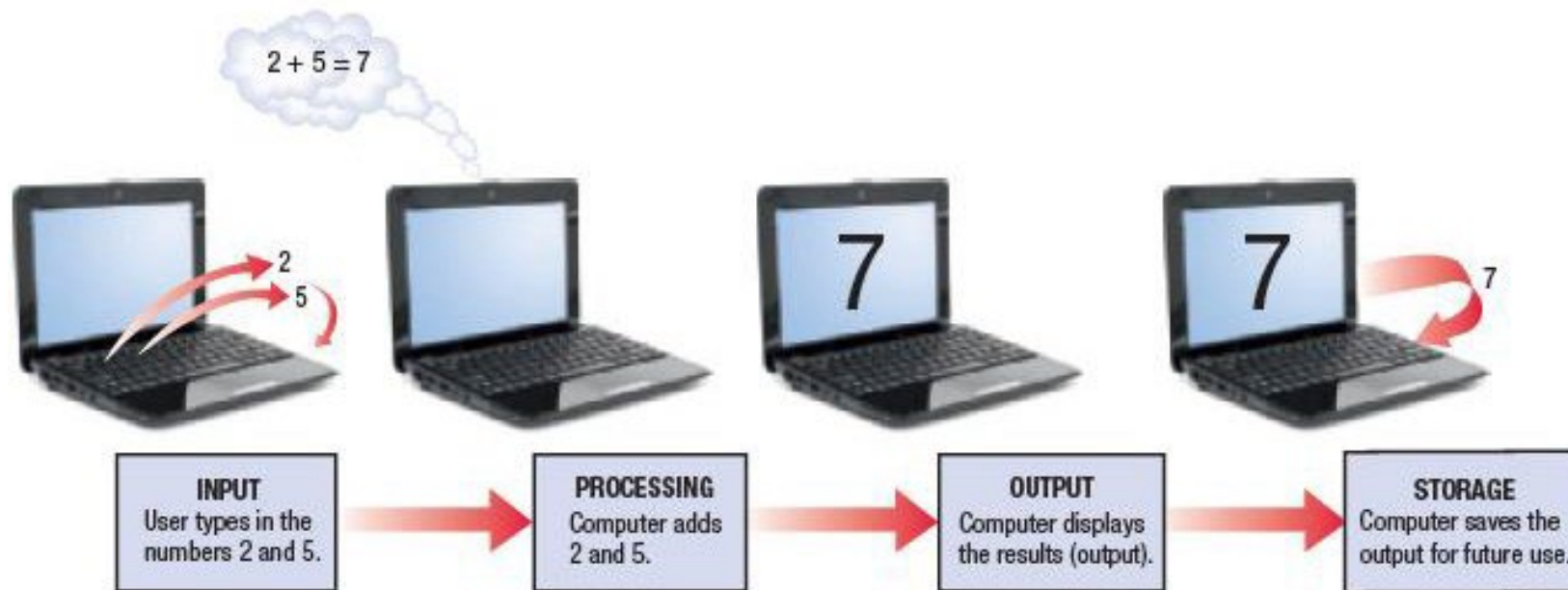
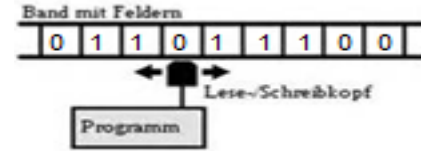
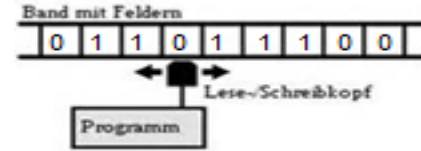


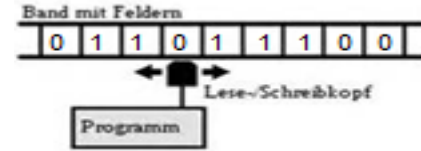
FIGURE 1-6
The information processing cycle.

What does a Computer do?



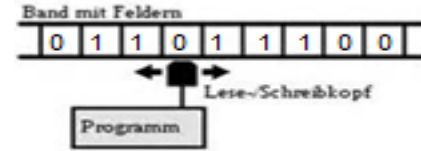
- Basic operations
 - Input: Entering data into the computer
 - Processing: Performing operations on the data
 - Output: Presenting the results
 - Storage: Saving data, programs, or output for future use
 - Communications: Sending or receiving data

Data vs. Information



- Data
 - Raw, unorganized facts
 - Can be in the form of text, graphics, audio, or video
- Information
 - Data that has been processed into a meaningful form
- Data processing
 - Converting data into information

Hardware



Hardware: The physical parts of a computer

- Internal hardware
 - Located inside the main box (system unit) of the computer
- External hardware
 - Located outside the system unit
 - Connect to the computer via a wired or wireless connection

Hardware

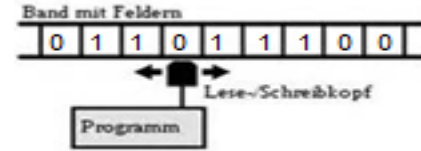
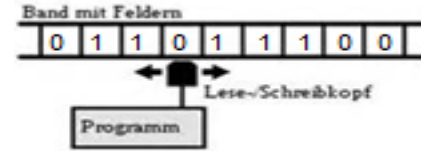


FIGURE 1-9
Typical computer hardware.

Hardware



Input devices

- Used to input data into the computer
- Keyboards, mice, scanners, cameras, microphones, joysticks, touch pads, touch screens, fingerprint readers, etc.

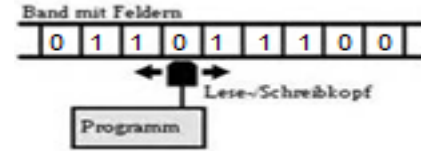
Processing devices

- Perform calculations and control computer's operation
- Central processing unit (CPU) and memory

Output devices

- Present results to the user
- Monitors, printers, speakers, projectors, etc.

Hardware



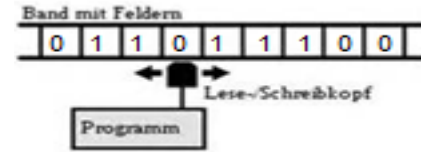
Storage devices

- Used to store data on or access data from storage media
- Hard drives, CD/DVD discs and drives, USB flash drives, etc.

Communications devices

- Allow users to communicate with others and to electronically access remote information
- Modems, network adapters, etc.

Software



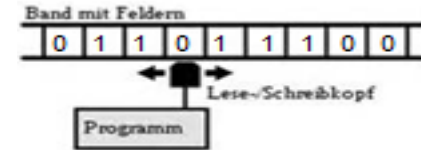
Software

- The programs or applications used to tell the computer hardware what to do.

System software

- The operating system starts up the computer and controls all operations (Windows, Mac OS, Linux, etc.)
- Launches programs at the user's instructions.
- Interacts with the user via windows, icons, menus, buttons, etc.

Software



WINDOWS DESKTOP
Provides the backdrop for icons, windows, and other objects.

ICONS
Represent folders, documents, or other items that can be opened.

WINDOWS
Rectangular areas containing programs, documents, or other data. The active window is the one currently being used.

DIALOG BOX
Displayed when needed to request information from the user.

MENU BAR
Opens menus that can be used to issue commands.

TOOLBAR
Contains buttons or icons that can be used to issue commands.

START BUTTON
Opens the Start menu that is used to launch programs.

PINNED PROGRAMS
Represent programs that can be opened directly from the taskbar.

TASKBAR BUTTONS
Correspond to open windows; can be used to preview thumbnails of open windows, as well as to change the active window.

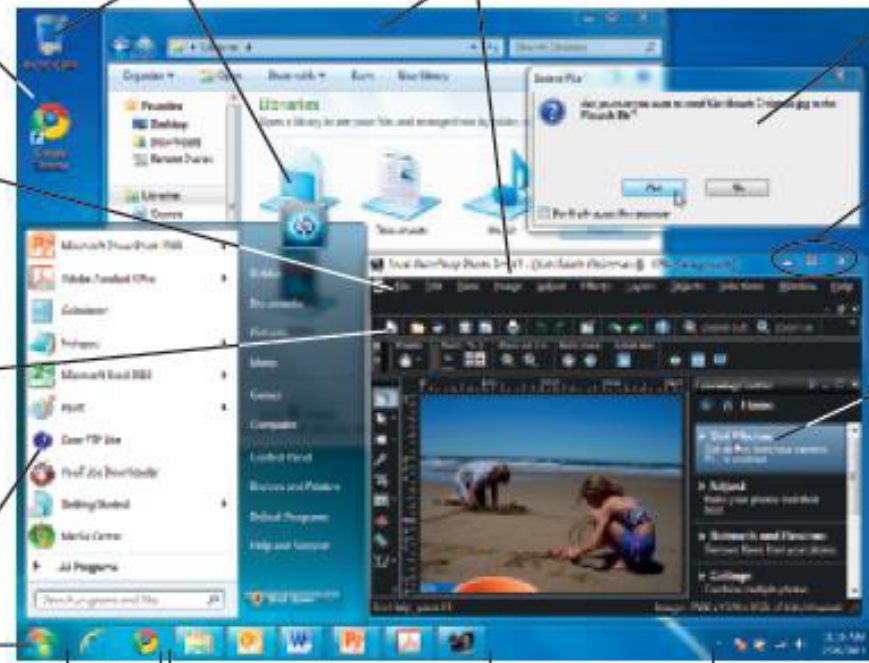
SIZING BUTTONS
Resize or close a window.

HYPERLINK
Issues a command to the computer when clicked.

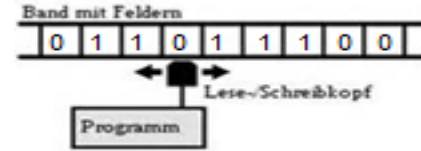
TASKBAR
Usually located at the bottom of the desktop.

NOTIFICATION AREA
Shows the clock and other indicators.

FIGURE 1-10
The Windows desktop.



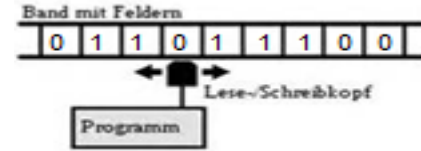
Application Software



Performs specific tasks or applications

- Creating letters, budgets, etc.
- Managing inventory and customer databases
- Editing photographs
- Scheduling appointments
- Viewing Web pages
- Sending and receiving e-mail
- Playing music and films
- Designing homes
- Playing games

End Users and Professionals

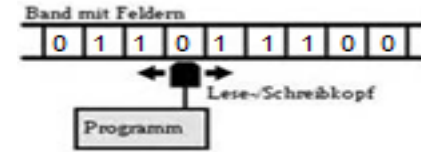


End users

- People who use a computer to obtain information.

Computer professionals include:

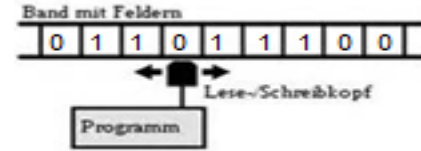
- Programmers write the programs computers use.
- Systems analysts design computer systems.
- Computer operations personnel manage day-to-day computer operations.
- Security specialists secure computers and networks against hackers.



The Internet and the World Wide Web



What is the Internet



The Interconnected network

- is a high-speed network of computers (servers).
- serves the purpose of data exchange.

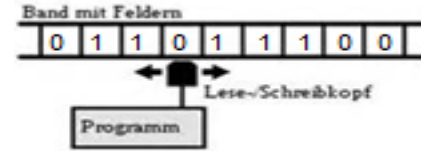
Internet is the short name of Interconnected network.

It allows the use of Internet services such as

WWW, E-mail, SSH, FTP, ...

Each computer in the net is (indirectly) connect to any other computer in the network via copper or fiber optic cable or via satellite.

What is the World Wide Web



The World Wide Web (WWW or the Web) is an information system where documents are identified by URLs

(Uniform Resource Locators: e.g. <https://www.bag.admin.ch>)

These documents

- may be interlinked by hypertext,
- are accessible over the Internet.

The origin of the World Wide Web

March 12, 1989:

British computer scientist Tim Berners-Lee lays the foundation for the World Wide Web.

He releases the code to the public on Dec. 25, 1990.



1993:

Mosaic, the browser credited with popularizing the web, is developed at the University of Illinois.



1994:

China gets first Internet connection, but filters content.

The White House launches its website, www.whitehouse.gov; some users who enter a .com address end up at a porn site.



1995:

Microsoft releases Internet Explorer

The online auction site eBay is launched.



1996:

Finland's Nokia launches first mobile phone with Internet connectivity.



1998:

Google begins operations, quickly growing into the leading search engine.