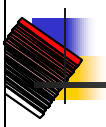
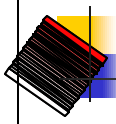


Introduction To Computers

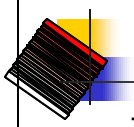
Chapter No 1

Introduction



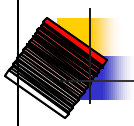
About the Course

- Course instructor
- Course policies
- Topics to be covered
- Course Website and Reference material
- Assignments and Projects



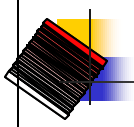
About the Course

- Text Book:
  - ***Computer, Communications and Information.***
    By Sarah Hutchinson and Stacey Sawyer.
- Reference Book:
  - ***Living With Computers***
    By Patrick Mckeown.
- Course website
  - http://www.ssuet.edu.pk/courses/ce101



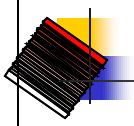
Topics to be covered

- Introduction and Overview of Computers
- Input/Output
- Storage Hardware
- Processing Hardware
- Number Systems
- Logic Gates
- Boolean Algebra
- Introduction to Communications and Networks
- The Internet and uses of Communications Technology
- Introduction to Information Systems
- Information Systems Analysis and Design
- Introduction to Databases
- Ethics, Privacy and Security



Exam and Grading

Assignments	5 Marks
Class Quiz	10 Marks
Mid-Term	10 Marks
Lab Viva	10 Marks
Presentation	5 Marks
Final Examination	60 Marks
Class Participation	3 Marks **(Bonus)**
Attendance and Behaviour	2 Marks **(Bonus)**



Final Project

- In form of Paper and Presentation
- Can be done in groups of 2 to 4 students
- Maximum limit of the paper is 20 pages
- … about 5000 to 10,000 words for 20 pages
- Use diagrams as appropriate
- Properly cite references you use!

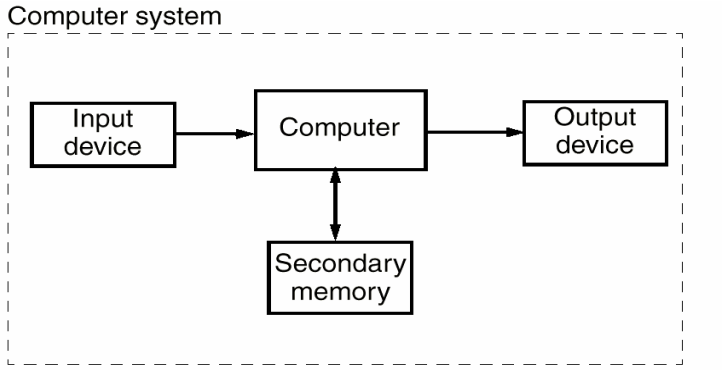
Course Schedule

- Tentative course outline, day by day
- Dates for exams, midterm and final are fixed.
- Note:
  - Outline is subject to change

What Is a Computer

- A data processing machine operated automatically under the control of a list of the instructions (called a program) stored in its main memory.

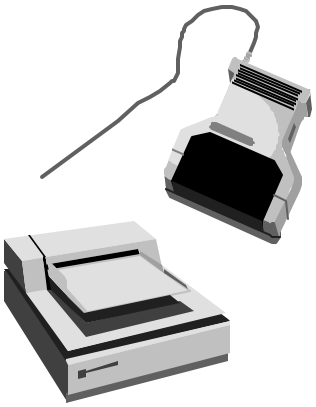
What Is a Computer System



Input - Processing - Output

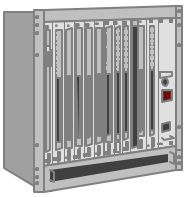
- **Input**

  what you type, read, or enter into computer
- **Devices**
  - keyboard
  - mouse
  - scanner
  - sensors, etc



Input - Processing - Output

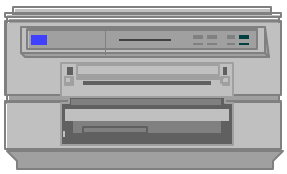
- **Processing** changes the input data via formatting, sorting, and calculations
- **Devices**
  - Components on the motherboard
  - CPU, ALU, Memory



Input - Processing - Output

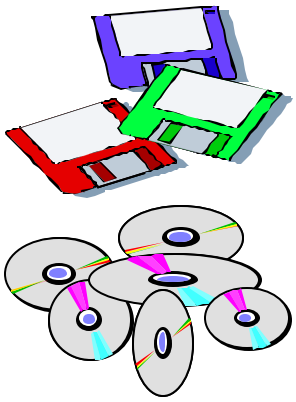
- **Output**

  results of computer processing
- **Devices**
  - screen
  - printer
  - plotter
  - signals, etc.



Input - Processing - Output

- **Storage**
  save information for later processing
- **Devices**
  - memory
  - diskette
  - hard disk
  - tape, etc.

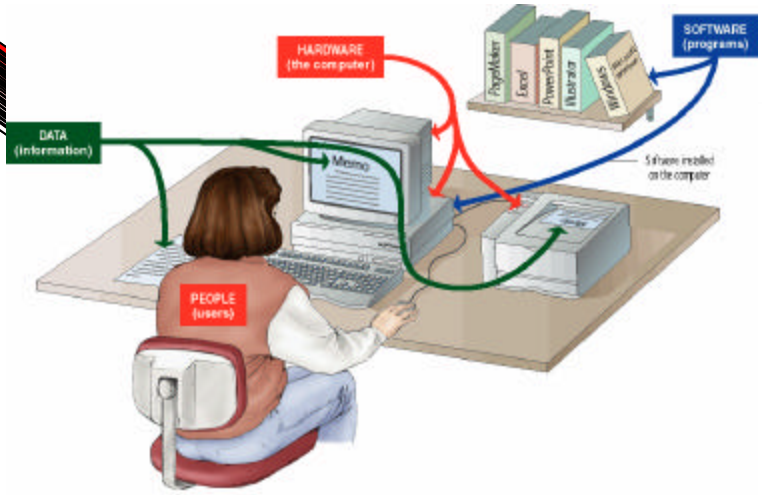


Parts of a Computer System

- **What is a Computer?**
  - A complete computer system includes 4 distinct parts:
    - Hardware
    - Software
    - Data
    - Users

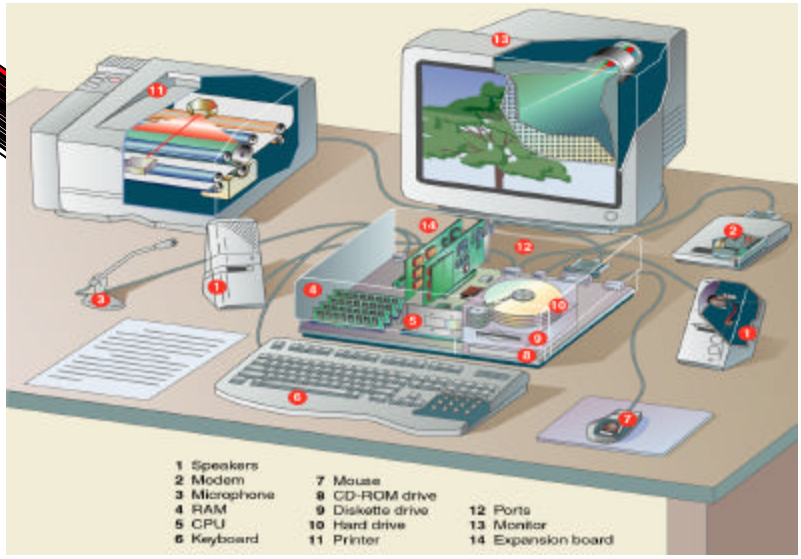
Parts of a Computer System

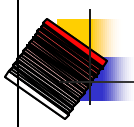
- **What is a Computer?**
  - A computer is an electronic device used to process data.
  - A computer can convert data into information that is useful to people.



Parts of a Computer System

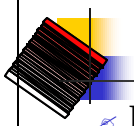
- **Hardware**
  - A computer's hardware consists of electronic devices; the parts you can see and touch.
  - The term "device" refers to any piece of hardware used by the computer, such as a keyboard, monitor, modem, mouse, etc.





Parts of a Computer System

- **Software**
  - Software – also called Programs – consists of organized sets of instructions for controlling the computer.
  - Some programs exist for the computer's use, to help it manage its own tasks and devices.
  - Other programs exist for the user, and enable the computer to perform tasks for you, such as creating documents.



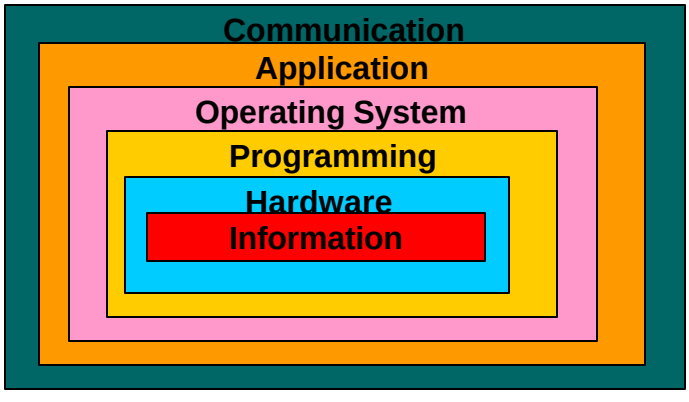
Parts of a Computer System

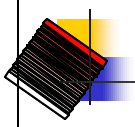
- **Data**
  - Data consists of raw facts, which the computer can manipulate and process into information that is useful to people.
  - Computerized data is digital, meaning that it has been reduced to digits, or numbers. The computer stores and reads all data as numbers.
  - Although computers use data in digital form, they convert data into forms that people can understand, such as text, numerals, sounds, and images.

Parts of a Computer System

- **People**
  - People are the computer's operators, or users.
  - Some types of computers can operate without much intervention from people, but personal computers are designed specifically for use by people.

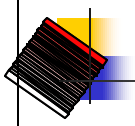
Layers of a Computing System





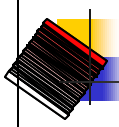
Early History of Computing

- **Abacus** **(16th century)**
  An early device to record numeric values
- **Blaise Pascal** **(middle 17th century)**
  Mechanical (gear driven) device to add, subtract, divide & multiply
- **Joseph Jacquard** **(late 18th century)**
  Jacquard's Loom, the punched card
- **Charles Babbage** **(19th century)**
  Analytical Engine, designed but never implemented



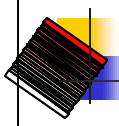
Early History of Computing

- **Alan Turing**
  Turing Machine, Artificial Intelligence Testing
- **Harvard Mark I, ENIAC, UNIVAC I**
  Early computers launch new era in mathematics, physics, engineering and economics



Generations of Computer

- Vacuum tube - 1946-1957
- Transistor - 1958-1964
- Small scale integration - 1965-1968
  - up to 100 devices
- Medium scale integration - 1968-1971
  - 100-3,000 devices on a chip



Generations of Computer

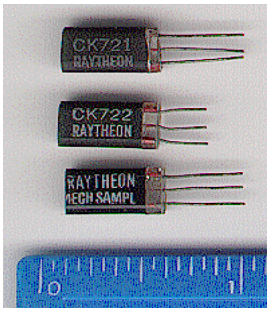
- Large scale integration - 1972-1977
  - 3,000 - 100,000 devices on a chip
- Very large scale integration - 1978 to date
  - 100,000 - 100,000,000 devices on a chip
- Ultra large scale integration
  - Over 100,000,000 devices on a chip

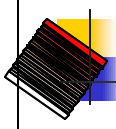
Generations of Computer

Generation	Approximate Dates	Technology	Typical Speed (Operation / Second)
1	1946-1957	Vacuum Tube	40,000
2	1958-1964	Transistor	200,000
3	1965-1971	Small and Medium Scale Integration	1,000,000
4	1972-1977	Large Scale Integration	10,000,000
5	1978- Onwards	Very Large Scale Integration	100,000,000

Generations of Computer

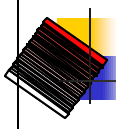
- Transistor - 1958-1964
  - Replaced vacuum tubes
  - Smaller and Cheaper
  - Less heat dissipation
  - Solid State device
  - Made from Silicon (Sand)
  - Invented 1947 at Bell Labs





Benefits of Integration

- Increased speed (shorter electrical path)
- Smaller computers
- Reduced cooling
- More reliable interconnections (on chip)
- Cheaper



Types of Computers

- Computers are of four types:
  - Microcomputers
  - Minicomputers
  - Mainframes
  - Supercomputers

Types of Computers

- **Microcomputers**
- This most widely used computer generally employs a microprocessor, “computer on a chip” and are desktop sized or less
- Two main types
  - Desktop (PC’s & Workstations)
  - Portable (Notebooks, Palmtops)

Types of Computers

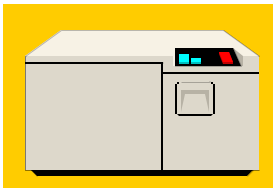
- Microcomputers
  - **Desktop**
    (PC’s & Workstations)
    - Small enough for a desktop, but not easily portable
    - Personal computers (PC’s) run general purpose software and are employed by a wide spectrum of users

Types of Computers

- Microcomputers
  - **Portable** (Notebooks, Palmtops)
    - Easily transported from one place to another
  - Four categories
    - Laptops
    - Notebooks
    - Palmtops
    - Personal Digital Assistants (PDA)

Types of Computers

- Minicomputers
  - Desk-sized
  - More processing speed and storage capacity than microcomputers
  - General data processing needs at small companies
  - Larger companies use them for specific purposes



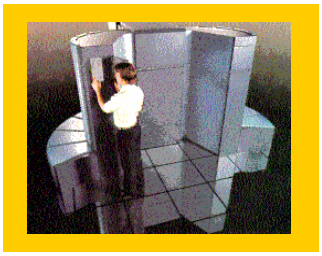
Types of Computers

- Mainframes

  - Larger machines with special wiring and environmental controls
  - Faster processing and greater storage than minicomputers
  - Typical machine in large organizations

Types of Computers

- Supercomputers



  - The most powerful of the four categories
  - Used by very large organizations, particularly for very math-intensive types of tasks