

CSE 100: Introduction to Computers

Lecture 1: Introduction

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Textbook

- *Introduction to Computers*,
Mohammed Alamgir, Adhuna
Prokashon.

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Grading Information

- **Grading**
 - Attendance 10%
 - Assignments, Tests, and presentation 20%
 - Midterm Exam 30%
 - Final Exam 40%
- **Policies**
 - Attendance is required
 - All submitted work must be yours
 - Cheating will not be tolerated
 - Assignments must be submitted by due date

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The Computer Defined

- Electronic device
- Converts data into information
- Computes on information
- Modern computers are digital
 - Two digits combine to make data
- Older computers were analog
 - A range of values made data

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Features of Computers

- Ability to be Programmed
- Speed
- Accuracy
- Diligence
- Price Decline
- Automation
- Memory

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Uses of Computers

- Education
 - Used in classroom, laboratory, library etc
 - Used in tests for faster result processing
 - E-books and online courses
 - Research is easier with search engines
- Publication
 - Used for Typesetting
 - Used to control printing machine
- Science
 - Simulation before practical implementation
 - Large mathematical operation done easily

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Uses of Computers

- Health and Medicine
 - Used in diagnosing illness (CAT, EMR, Digital XRAY)
 - Used in monitoring patients
 - Used in Controlling and coordinating equipments
 - Used in keeping medical records
- Business
 - Accounting and Inventory software
 - Used to communicate with business associates easily
 - ATM machines helps automate financial transactions
- Industry
 - Used for automation of plants
 - CAD and CAM used to ease-up design and manufacturing
 - Robotics

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Uses of Computers

- Music
 - Used for sound recording and editing
 - Used to create music with virtual instruments
- Communication
 - Mobile communication
 - VOIP
 - Email and online messaging
- Entertainment
 - CD, VCD, DVD
 - Recording Television
 - Video Games
 - Online magazines
 - Video editing and creation

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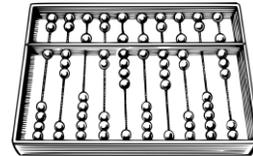
History of computers

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History of Computers

- Abacus introduced the idea of computing/ or calculation
- Invented in China
- Is a semi mechanical calculating device

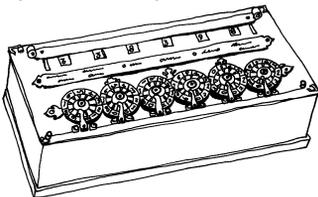


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History of Computers

- Pascal's calculator is a mechanical calculator invented by Blaise Pascal in the early 17th century.



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History of Computers



- By 1822 the English mathematician **Charles Babbage** was proposing a steam driven calculating machine the size of a room, which he called the **Difference Engine**.

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History of Computers

- One early success was the Harvard **Mark I** computer which was built as a partnership between Harvard and IBM in 1944.
- This was the first programmable digital computer made in the U.S.
- But it was not a purely electronic computer. Instead the Mark I was constructed out of switches, relays, rotating shafts, and clutches.
- The machine weighed 5 tons, incorporated 500 miles of wire, was 8 feet tall and 51 feet long, and had a 50 ft rotating shaft running its length, turned by a 5 horsepower electric motor.

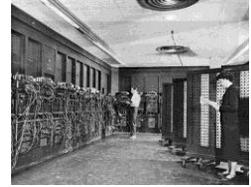


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History of Computers

- ENIAC was short for **E**lectronic **N**umerical **I**ntegrator **A**nd **C**omputer. It was the first general purpose (programmable to solve any problem) electric computer. It contained over 17,000 vacuum tubes, weighed 27 tons and drew 150 kW of power to operate.

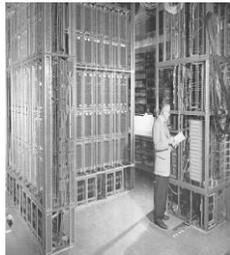


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History of Computers

- It took days to change ENIAC's program.
- Eckert and Mauchly's next teamed up with the mathematician **John von Neumann** to design **EDVAC**, which pioneered the **stored program**.
- After **ENIAC** and **EDVAC** came other computers with humorous names such as **ILLIAC**, **JOHNNIAC**, and, of course, **MANIAC**.



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History of Computers

- The **UNIVAC** computer was the first commercial (mass produced) computer.
- In the 50's, UNIVAC (a contraction of "Universal Automatic Computer") was the household word for "computer" just as "Kleenex" is for "tissue".
- UNIVAC was also the first computer to employ magnetic tape.



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History of Computers

- Scelbi Mark-8 Altair and IBM 5100 computers are first marketed to individuals (as opposed to corporations). They are followed by the Apple I, II, TRS-80, and Commodore Pet computers by 1977.



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History of Computers

- The IBM PC is introduced running the Microsoft Disk Operating System (MS-DOS) along with CP/M-86. The IBM PC's open architecture made it the de-facto standard platform, and it was eventually replaced by inexpensive clones.
- CPU: Intel 8088 @ 4.77 MHz
- RAM: 16 kB ~ 640 kB
- Price: \$5,000 - \$20,000



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History of Computers

- Apple introduces the first successful consumer computer with a WIMP user interface (Windows Icons Mouse & Pointer), modelled after the unsuccessful Xerox Alto computer.
- Motorola 68000 @8Mhz
- 128KB Ram
- US\$1,995 to US\$2,495



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Types of computers

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Computers For Individual Use

- Desktop computers
 - The most common type of computer
 - Sits on the desk or floor
 - Performs a variety of tasks
- Workstations
 - Specialized computers
 - Optimized for science or graphics
 - More powerful than a desktop

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Computers For Individual Use

- Notebook computers
 - Small portable computers
 - Weighs between 1 and 3 KG
 - Ranges from 8 inches to 20 inches diagonal
 - Typically as powerful as a desktop
 - Can include a docking station
- Tablet computers
 - Newest development in portable computers
 - Input is through a pen or touch
 - Can be specialized or general purpose

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Computers For Individual Use

- Handheld computers
 - Very small computers
 - Personal Digital Assistants (PDA)
 - Note taking or contact management
 - Data can synchronize with a desktop
- Smart phones
 - Hybrid of cell phone and PDA
 - Web surfing, e-mail access, mobile games
 - Getting powerful with new developments

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Computers For Organizations

- Mainframes
 - Used in large organizations
 - Handle thousands of users
 - Users access through a terminal
- Network servers
 - Centralized computer
 - All other computers connect
 - Provides access to network resources
 - Multiple servers are called server farms
 - Often simply a powerful desktop

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Computers For Organizations

- Minicomputers
 - Called midrange computers
 - Power between mainframe and desktop
 - Handle hundreds of users
 - Used in smaller organizations
 - Users access through a terminal

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Computers For Organizations

- Supercomputers
 - The most powerful computers made
 - Handle large and complex calculations
 - Process trillions of operations per second
 - Found in research organizations

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Computers In Society

- More impact than any other invention
 - Changed work and leisure activities
 - Used by all demographic groups
- Computers are important because:
 - Provide information to users
 - Information is critical to our society
 - Managing information is difficult

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Computers In Society

- Computers at home
 - Many homes have multiple computers
 - Most American homes have Internet
 - Computers are used for
 - Business
 - Entertainment
 - Communication
 - Education

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Computers In Society

- Computers in education
 - Computer literacy required at all levels
- Computers in small business
 - Makes businesses more profitable
 - Allows owners to manage
- Computers in industry
 - Computers are used to design products
 - Assembly lines are automated

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Computers In Society

- Computers in government
 - Necessary to track data for population
 - Police officers
 - Tax calculation and collection
 - Governments were the first computer users

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Computers In Society

- Computers in health care
 - Revolutionized health care
 - New treatments possible
 - Scheduling of patients has improved
 - Delivery of medicine is safer

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Generations of computer

Generations of computers

- First Generation (1944-1958)
 - Uses of Vacuum Tubes
 - Machine and assembly language used to program
- Second Generation (1959-1963)
 - Transistor based devices
 - Fortran and Cobol were main programming language
- Third Generation (1964-1970)
 - Integrated circuit based computers
 - Small in size
 - Low production cost
- Fourth Generation (1971 - Present)
 - Use of microprocessor
 - Faster computers

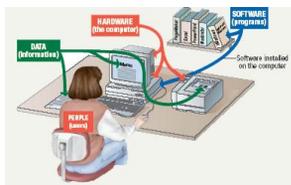
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Looking Inside the Computer System

Parts of the Computer System

- Computer systems have four parts
 - Hardware
 - Software
 - Data
 - User



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Parts of the Computer System

- Hardware
 - Mechanical devices in the computer
 - Anything that can be touched
- Software
 - Tell the computer what to do
 - Also called a program
 - Thousands of programs exist

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Parts of the Computer System

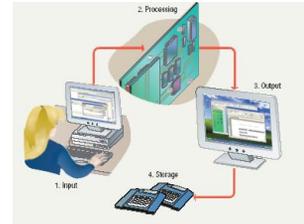
- Data
 - Pieces of information
 - Computer organize and present data
- Users
 - People operating the computer
 - Most important part
 - Tell the computer what to do

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Information Processing Cycle

- Steps followed to process data
- Input
- Processing
- Output
- Storage

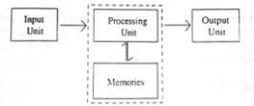
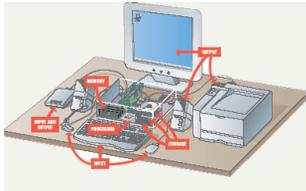


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Essential Computer Hardware

- Computers use the same basic hardware
- Hardware categorized into four types



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Essential Computer Hardware

- Processing devices
 - Brains of the computer
 - Carries out instructions from the program
 - Manipulate the data
 - Most computers have several processors
 - Central Processing Unit (CPU)
 - Secondary processors
 - Processors made of silicon and copper

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Essential Computer Hardware

- Memory devices
 - Stores data or programs
 - Random Access Memory (RAM)
 - Volatile
 - Stores current data and programs
 - More RAM results in a faster system
 - Read Only Memory (ROM)
 - Permanent storage of programs
 - Holds the computer boot directions

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Essential Computer Hardware

- Input and output devices
 - Allows the user to interact
 - Input devices accept data
 - Keyboard, mouse
 - Output devices deliver data
 - Monitor, printer, speaker
 - Some devices are input and output
 - Touch screens

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Essential Computer Hardware

- Storage devices
 - Hold data and programs permanently
 - Different from RAM
 - Magnetic storage
 - Floppy and hard drive
 - Uses a magnet to access data
 - Optical storage
 - CD and DVD drives
 - Uses a laser to access data

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Software Runs The Machine

- Tells the computer what to do
- Reason people purchase computers
- Two types
 - System software
 - Application software

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Software Runs The Machine

- System software
 - Most important software
 - Operating system
 - Windows 10
 - Network operating system (OS)
 - Windows Server 2003
 - Utility
 - Symantec AntiVirus
 - Avro
 - MS Word, MS Excel, MS Powerpoint

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Software Runs The Machine

- Application software
 - Accomplishes a specific task
 - Most common type of software
 - MSWord
 - Covers most common uses of computers

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Computer data

- Fact with no meaning on its own
- Stored using the binary number system
- Data can be organized into files

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Computer users

- Role depends on ability
 - Setup the system
 - Install software
 - Mange files
 - Maintain the system
- “Userless” computers
 - Run with no user input
 - Automated systems

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END

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