Introduction

Instructor: Dr. Khurram Jadoon

Slides prepared by: Prof. Dr. Zahid Halim

Instructor

Email: Khurram.jadoon@giki.edu.pk

Faculty of Computer Science and Engineering

Office: S-08, AcB, Second Floor

Office Hours:

Wednesday/Thursday	9:00 AM - 4:00 PM

Course TA

- Mr. Asad Majeed
- Never hesitate to contact TA or me whenever you have some problem

Books

Text books:

- Paul J. Deitel and Harvey M. Dietel, “ C++20 for Programmers ”, 9th Edition, Deitel & Associates, Inc. (2022)

Reference books:

- Chakraborty, U., Banerjee, A., Saha, J. K., Sarkar, N., & Chakraborty, C. (Eds.). (2022). Artificial intelligence and the fourth industrial revolution. CRC Press.

- Parsons, J. J. (2022). New Perspectives Computer Concepts Comprehensive. Cengage Learning.

Dishonesty, Plagiarism in Quizzes, Assignments

- All individuals involved in any kind of cheating in any exam, quiz, assignment or project will get penalties.

Attendance

- Students are required to attend 100% classes of courses registered .

- For circumstances beyond their control, students must apply for leave on prescribed Leave Application form.

Tentative Evaluation Breakdown

Assignments (8)	10
Quizzes (8)	10
Term Project (1)	10
Midterm (1)	30
Final (1)	40
Total	100

Course Execution

- 2 lectures of one hour every week
- 1 lab of three hours every week (CS 101 L)
- Course contents at CMS/LMS

Motivation

- Core of core of computer science
- Excellent Programming = Excellent chances of good job
- Remember practice makes a person “perfect”.
  - Same goes for programming.

Course Outline

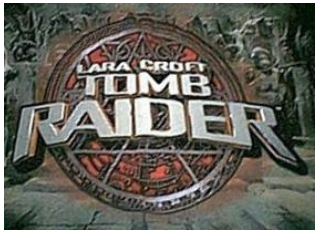
Lecture 01. Modern Computer, Data Representation in Computer
Lecture 02. Data Representation in Computer
Lecture 03. Artificial intelligence and the computer learning, Software and hardware for AI-based systems
Lecture 04. Basics of natural language processing and its applications
Lecture 05. Algorithms, Flowcharts, Pseudocode, Memory Concepts, Athematic operators
Lecture 06. Types of Programming Languages (for desktop, web, mobile, and others)
Lecture 07. Variables in C++ and basis I/O operations
Lecture 08. Programming logic development and case studies
Lecture 09. C++ control structures
Lecture 09. Control Structures: If Selection Statement
Lecture 10. Control Structures: If……..Else Selection Statement
Lecture 11. Nested Control Structures
Lecture 12. Switch Multiple Selection Statement, Increment Decrement Operator
Lecture 13. The Essential of Repetition: Counter-Controlled Repetition
Lecture 14. The Essential of Repetition: Sentinel-Control Repetition
Lecture 15.While Repetition Statement, do….while Repetition Statement
Lecture 16. For Repetition Statement
Lecture 17. Break and Continue Statement
Lecture 18. Functions: Definition, Prototypes, Calling
Lecture 19. Call by Value
Lecture 20. Call by Reference
Lecture 21. Random Number Generation
Lecture 22. Storage Classes, Scope Rules
Lecture23. Arrays Declaration
Lecture 24. Arrays Examples
Lecture 25. Passing Arrays to Functions
Lecture 26. Searching Arrays
Lecture 27. Pointers
Lecture 28.Passing Pointers as Function Parameters
Lecture 29. Library Functions
Lecture 30. Header Files

Computers Today

A Tool for Communication

A Tool for Entertainment

Multimedia

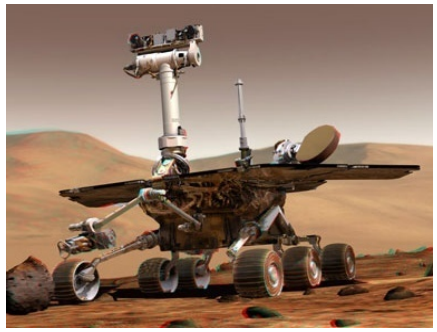


Games

Computer Revolution !

Flight Simulator

Mars Rover



Google Servers

Wearable Computer

Computer

- We know how to use a computer
- We have an idea where it stands today
- YOU have to contribute towards its future !
- Now let's look at what it is and the modest beginnings from where it evolved !

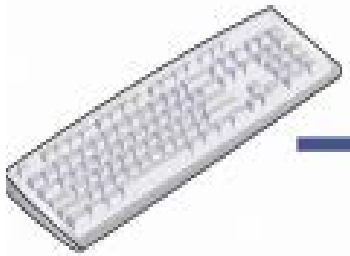
History of Computer

What is a Computer (-1-)

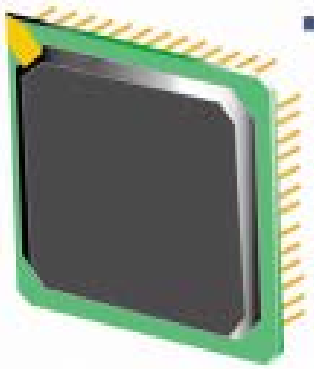
- A computer is a ***machine*** that
  - ***inputs*** (takes in) facts and information (known as ***data****)
  - then ***processes*** (does something to or with) it
  - can also ***store*** data
  - afterwards it ***outputs***, or displays, the results for you to see

***** Data is all kinds of information, including, pictures, letters, numbers, and sounds

What is a Computer (-2-)



A computer accepts input from an input device, such as a keyboard, mouse, scanner, or digital camera.



Data is processed in the CPU according to instructions that have been loaded into the computer's memory.

Computers produce output on devices such as screens and printers.

A computer uses disks, CDs, and DVDs to permanently store data.

What is a Computer (-3-)

- The defining feature of modern computers which distinguishes them from all other machines is that they can be ***programmed***
  - a list of instructions (the ***program***) can be given to the computer e.g.,
    - add one number to another
    - move some data from one location to another
    - send a message to some external device, etc
  - it will store them (in ***memory***)
  - and carry them out (***execute***) some time in future
    - Usually in the same order in which the instructions were given

History of Computer (-1-)

- The first use of the word "***computer***" was recorded in 1613
  - referring to ***a person who carried out calculations***, or computations !

- The word continued to be used in that sense until the middle of the 20th century
  - before modern ***electronic computers*** were developed

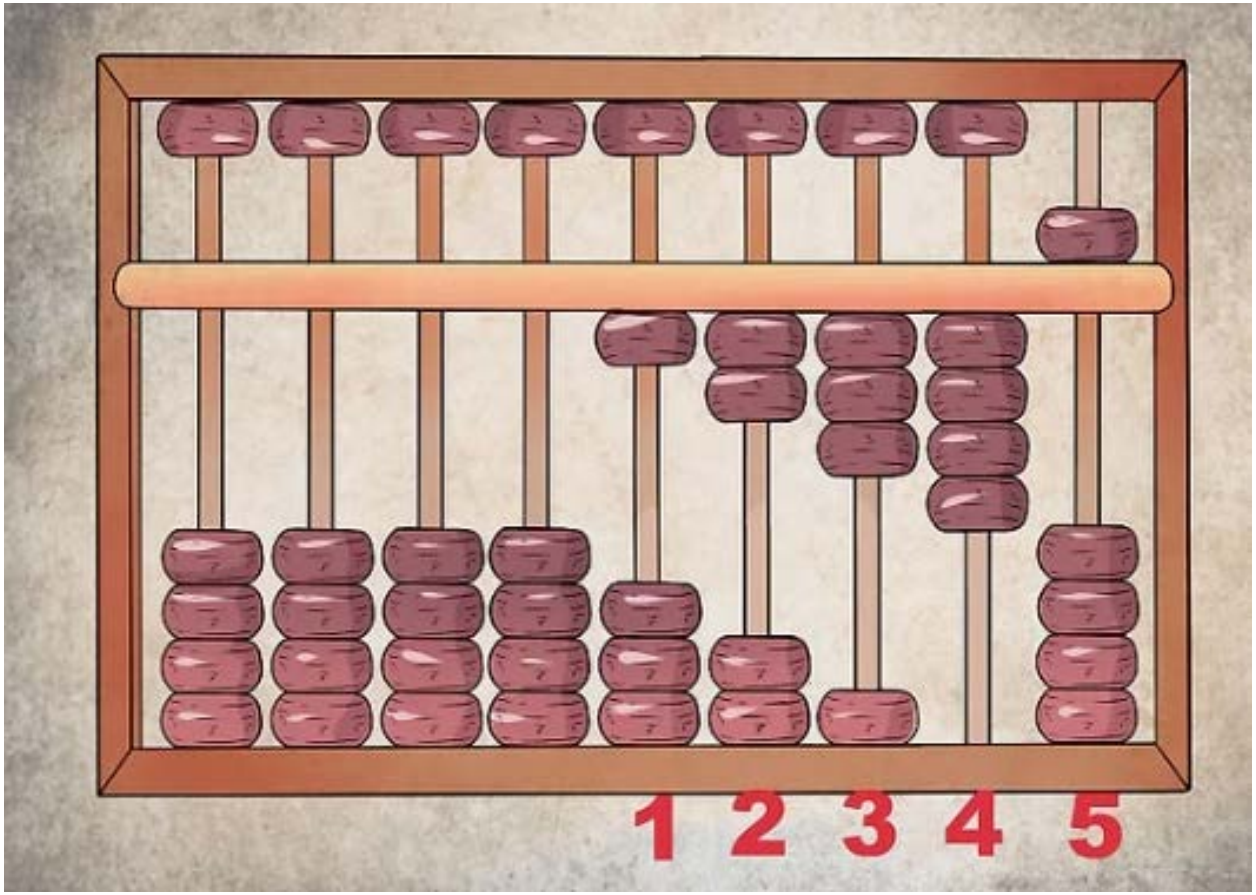
History of Computer (-2-)

- The history of the modern computer begins with two separate technologies
  - Automated Calculation
  - Programmability

- Early computers were ***mechanical calculating devices*** such as
  - Abacus, 3000 B.C

History of Computer (-3-)

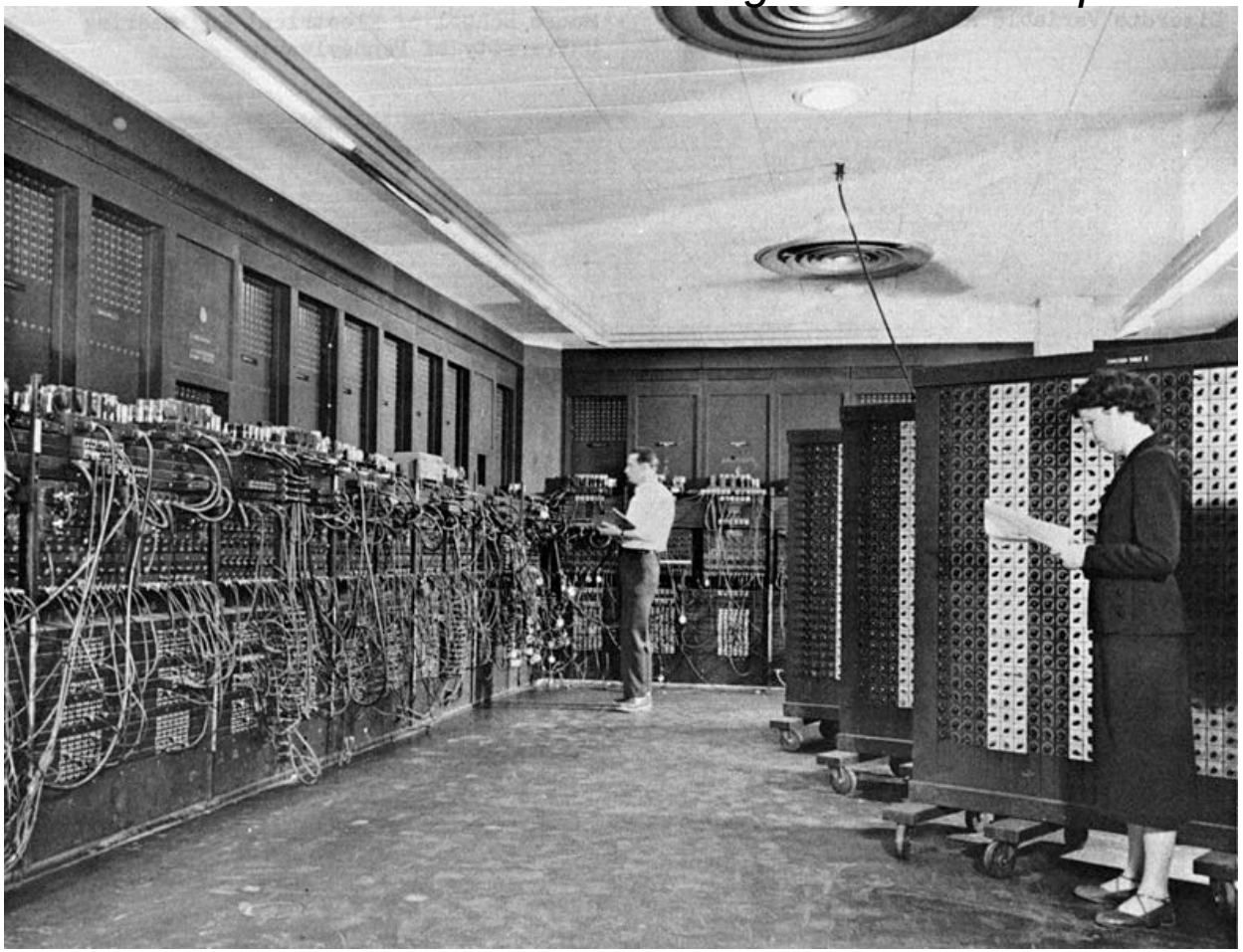
Chinese Abacus: *for performing arithmetic processes*



https://www.wikihow.com/Use-an-Abacus

History of Computer (-6-)

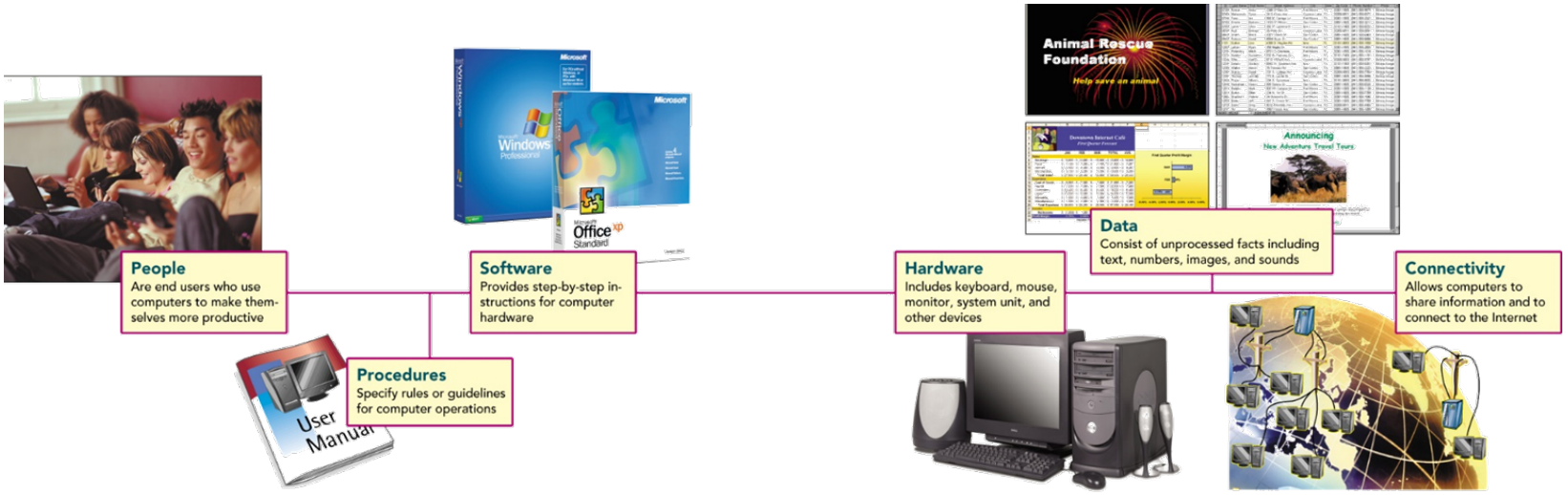
ENIAC - *Electronic Numerical Integrator And Computer* -



Working on, rather ***'inside'*** , **ENIAC**

Five Parts of an Information *System*

1. ***People***
2. ***Procedures***
3. ***Software***
4. ***Hardware***
5. ***Data***



People

- **Most important part of any system**
- **Contact is …**
  - **Direct**
  - **Indirect**
- **Computer uses**
  - **Business & Entertainment**
  - **Education & Medicine**

Software

- ***Programs***
- **Two major kinds of software**
  - ***System Software***
  - ***Application Software***

System Software

- **A collection of programs**
- **Enables the application software to interact with the hardware**
- **Background software that helps the computer manage its own resources**

Return

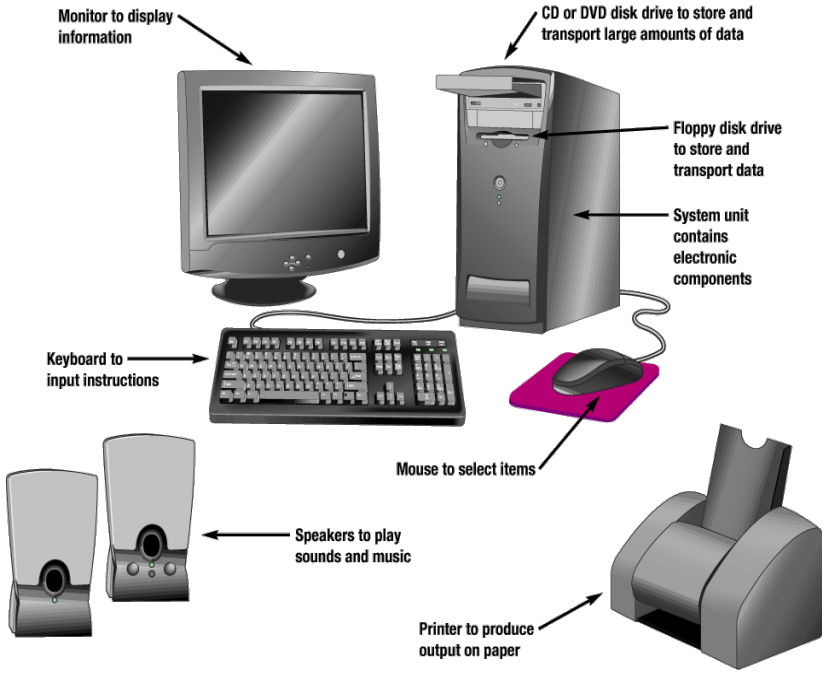
Application Software

- **"*End-user*" software**
- **Two major categories**
  - ***General purpose***
  - ***Special purpose***

Return

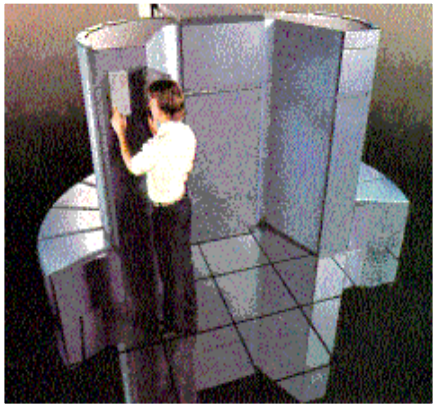
Hardware

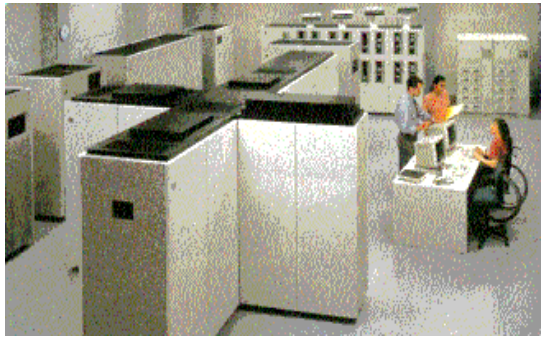
- **Equipment that processes the data**
- **Controlled by software**
- **Physical devices**
  - ***Keyboard***
  - ***Mouse***
  - ***Monitor***
  - **Other devices**



Types of Computers

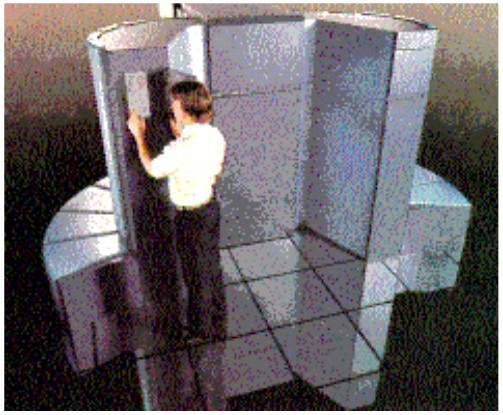
- ***Supercomputers***
- ***Mainframe computers***
- ***Minicomputers***
- ***Microcomputers***





Supercomputers

- **High capacity**
- **Used by very large organizations**
  - **Tracking space**
  - **Tracking weather**



Return

Mainframe Computers

- Occupies specially wired, air-conditioned rooms
- Capable of great processing speeds and data storage
- Not as powerful as supercomputers

Return

Minicomputers

- **Known as *midrange computers***
- **Used by medium-size companies**
- **Used by departments of large companies**

Return

Microcomputers

- **Least powerful**
- **Widely used**
- **Four types of Microcomputers**

Return

Four Types of Microcomputers

- ***Desktop***
- ***Notebook or laptop***
- ***Tablet PC***
- ***Handheld***

Desktop

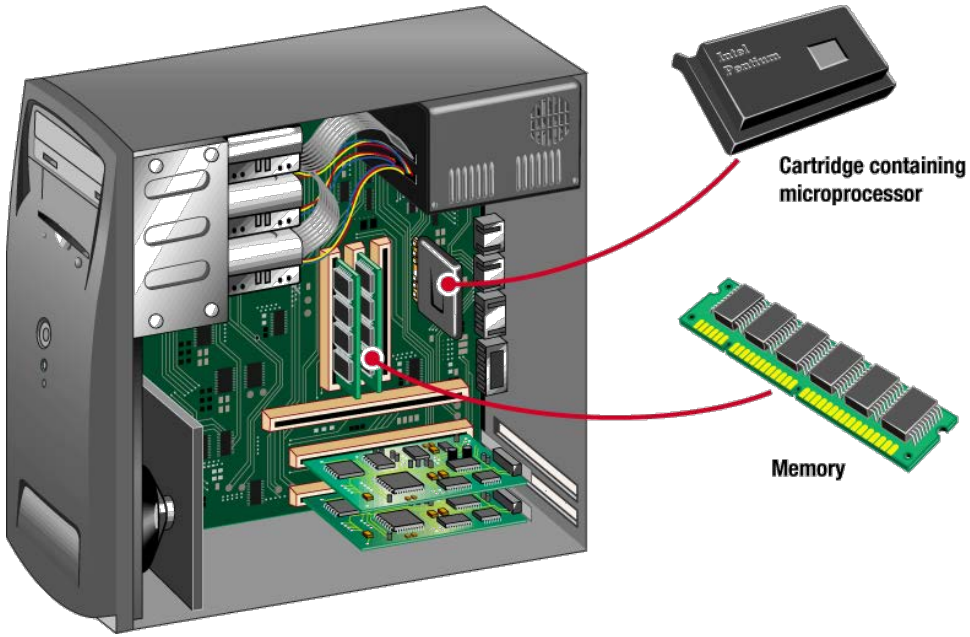
Notebook

Handheld

Tablet PC

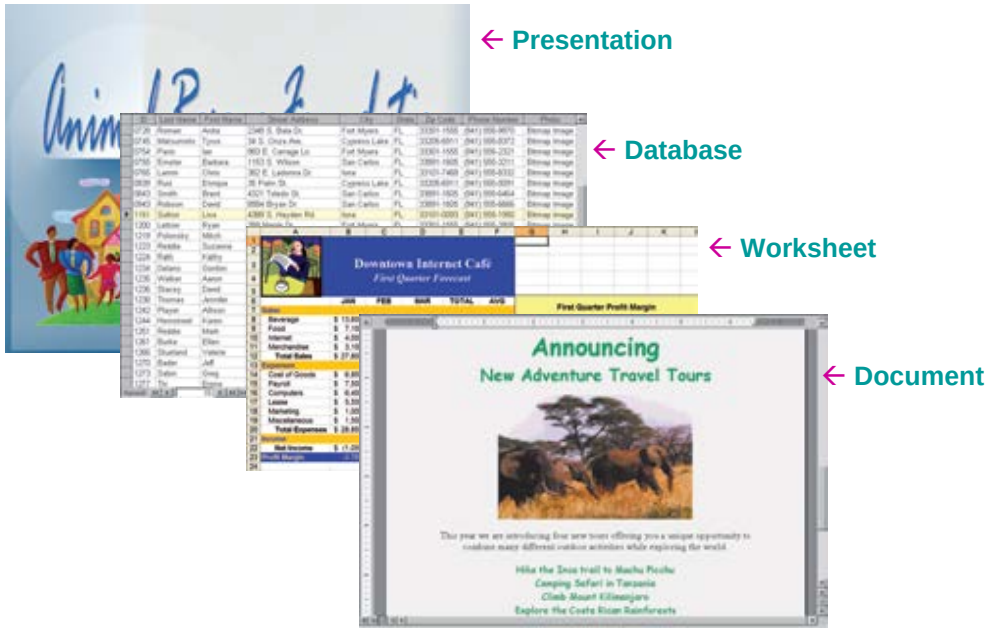
Microcomputer Hardware

- ***System unit***
- ***Input/output devices***
- ***Secondary storage***
- ***Communications***



Data

- **Raw, unprocessed facts**
- **Processing creates *information***
- **Stored electronically in files**
  - ***Document files***
  - ***Worksheet files***
  - ***Database files***
  - ***Presentation files***



Document Files

- **Created by word processors to save documents such as memos, term papers, and letters**

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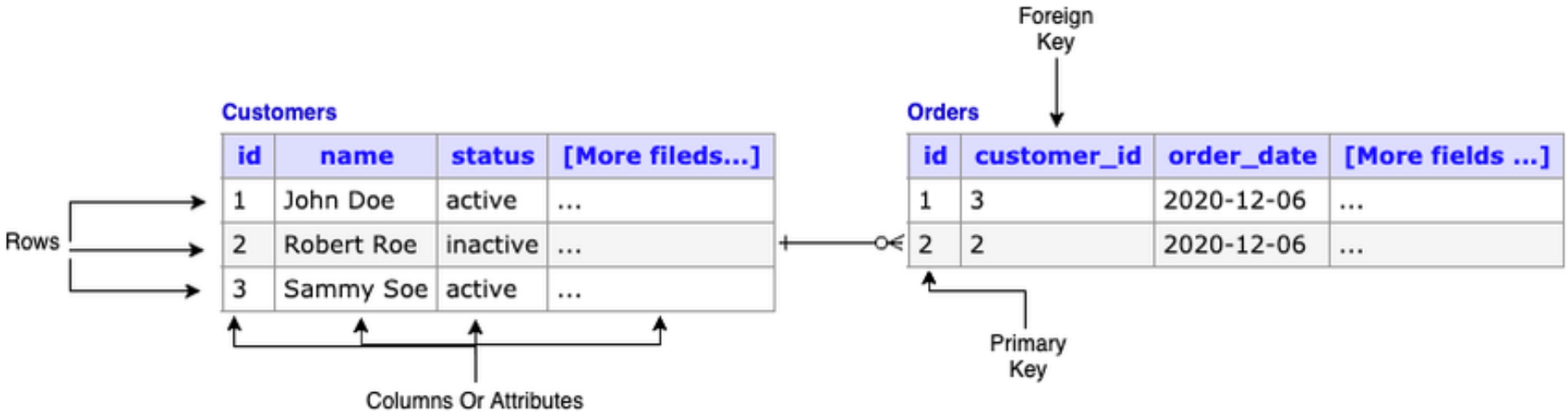
Worksheet Files

- **Created by electronic spreadsheets to analyze things like budgets and to predict sales**

Return

Database Files

- **Typically created by database management programs to contain highly structured and organized data**



Return

Presentation Files

- **Created by presentation graphics programs to save presentation materials. For example, a file might contain audience handouts, speaker notes, and electronic slides.**

Return

Connectivity, the Wireless Revolution, and the Internet

- ***Connectivity***
  - **Sharing of information**
  - ***Wireless* communication is becoming popular**
- ***Computer networks***
  - **Connected communication system of computers**
  - **Largest network is the *Internet***

Knowledge Foundation

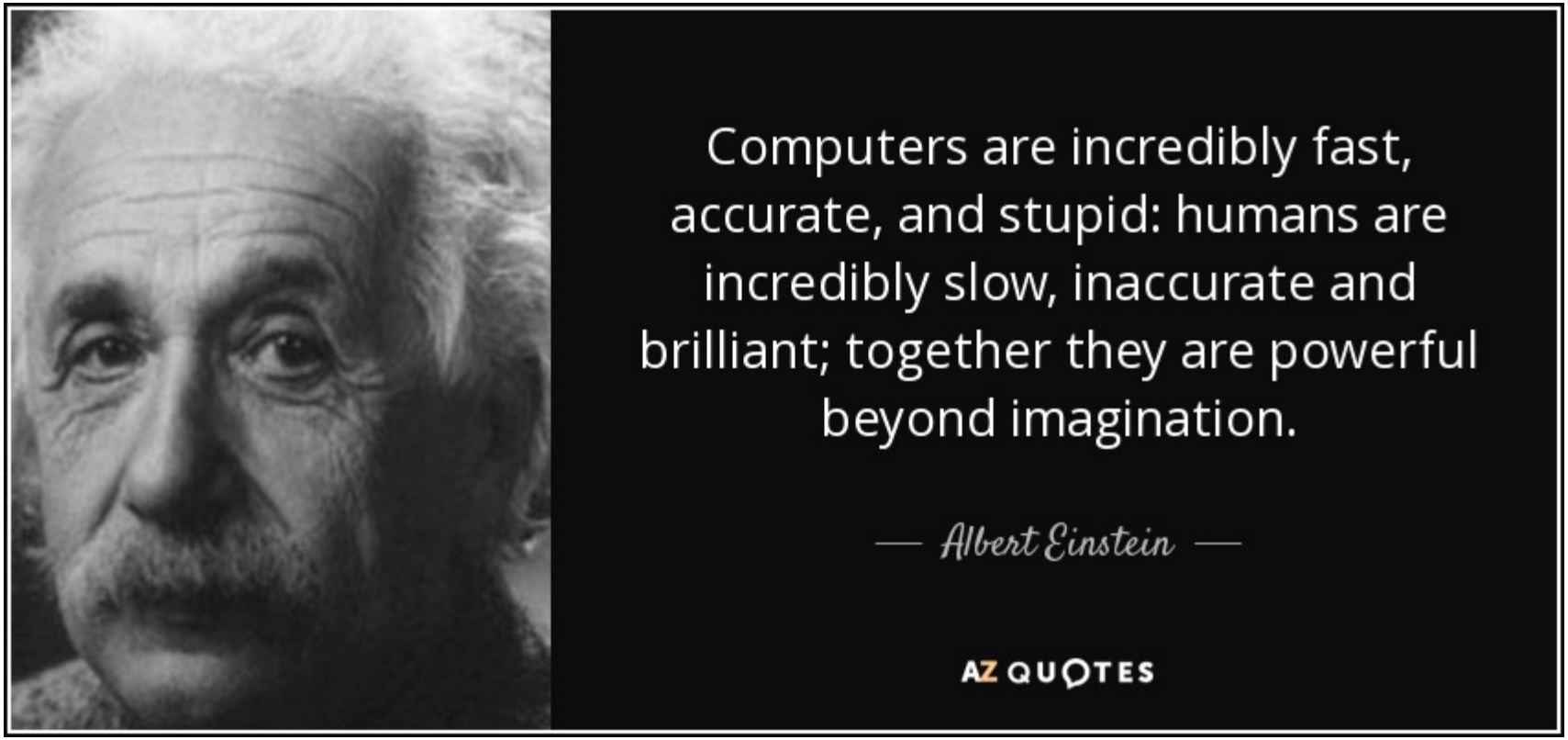
Being *Computer Competent* means using and understanding *Information Technology (IT)*

Some Important IT Developments

- **The Internet & *the Web***
- **Powerful software & hardware**
- **Privacy & security**
- **Organizations**
- **Changing Times**

Do you know GIKI has a super computer?

- The facility consists of 160 CPU Cores,
- 1024 GPU Cores
- 640 GB RAM



By the way, Einstein (1879-1955) never said this ☺

References

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- http://en.wikipedia.org/wiki/Computer
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