



# CS F111: Computer Programming

(Second Semester 2021-22)

## Lect2: History of Computers

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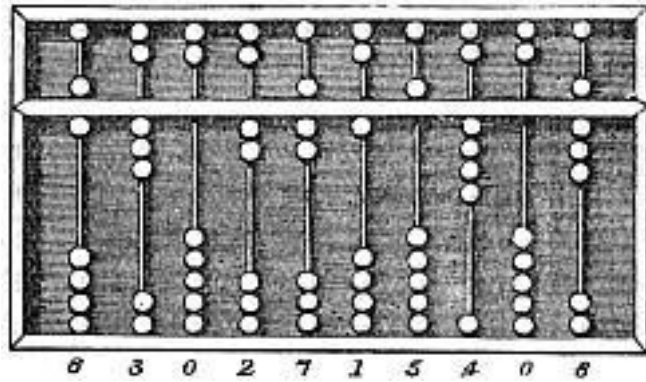
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**BITS Pilani**

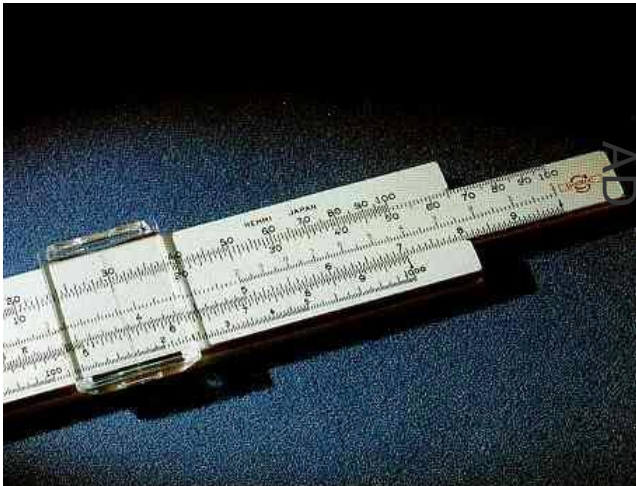
Hyderabad Campus

# The early computing hardware



2500BC

The Chinese abacus



1633

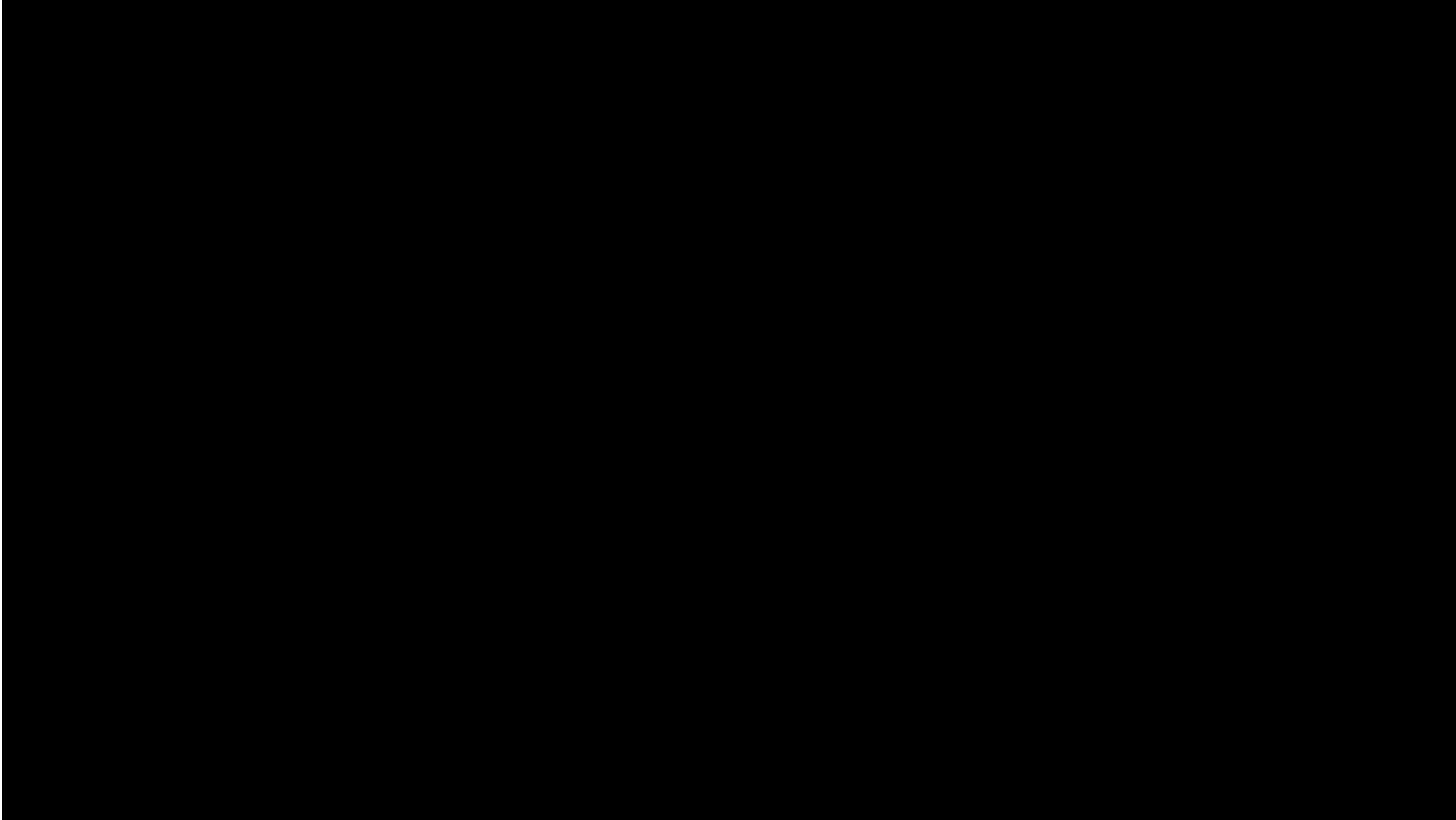
The Slide rule (logarithm)



(1801 AD)

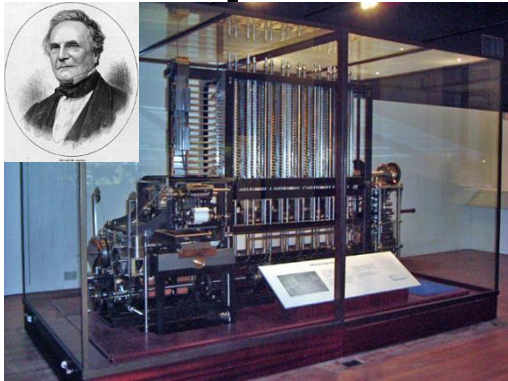
Jacquard looms

Lets Watch a small video to understand the history of computers





# The early modern computer



Babbage's difference engine (1842 AD)



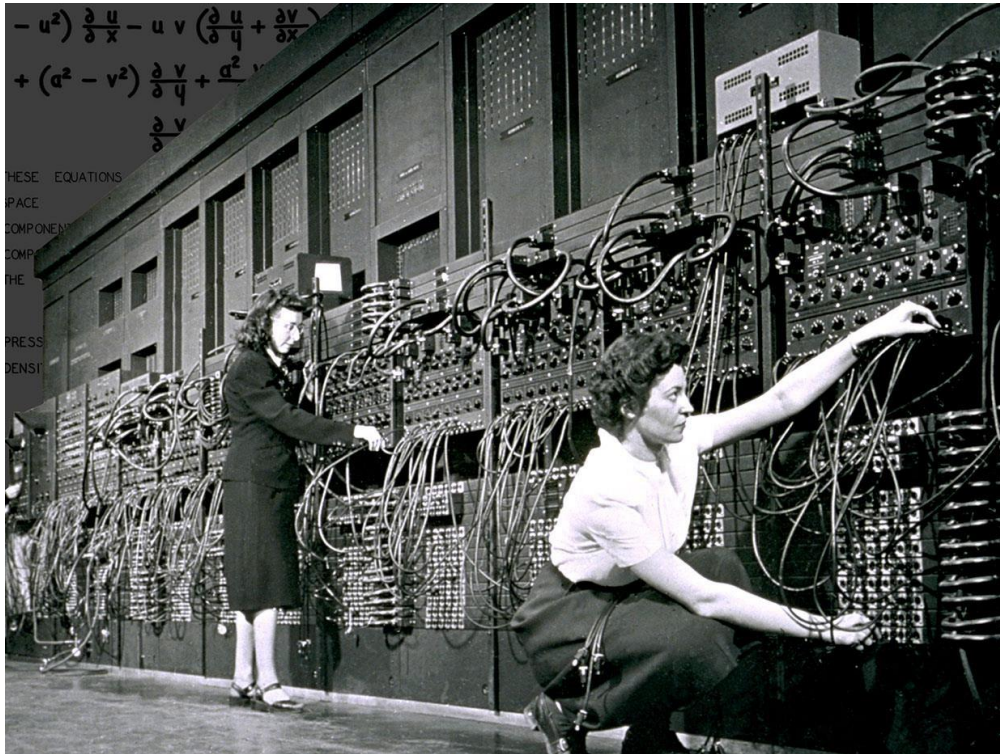
First Computer Programmer

Diagram for the computation by the Machine of the Numbers of Bernoulli. See Note G. (page 722 of seq.)

Number of Operation. Nature of Operation.	Variables acted upon.	Variables receiving results.	Indication of change in the value on any Variable.	Statement of Results.	Data.										Working Variables.				Result Variables.			
					$V_1$	$V_2$	$V_3$	$V_4$	$V_5$	$V_6$	$V_7$	$V_8$	$V_9$	$V_{10}$	$V_{11}$	$V_{12}$	$V_{13}$	$V_{14}$	$V_{15}$	$V_{16}$	$V_{17}$	
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1	$\times V_2 \times V_3$	$V_4, V_5, V_6$	$V_4 = V_2 \times V_3$ $V_5 = V_2 \times V_3$ $V_6 = V_2 \times V_3$	$= 2n$	2	n	2n	2n	2n	2n	2n	2n	2n	2n	2n	2n	2n	2n	2n	2n	2n	
2	$- V_4 - V_5$	$V_4, V_5$	$V_4 = V_4 - V_5$ $V_5 = V_5 - V_4$	$= 2n - 1$	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
3	$+ V_4 + V_5$	$V_4, V_5$	$V_4 = V_4 + V_5$ $V_5 = V_5 + V_4$	$= 2n + 1$	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
4	$+ V_4 + V_5$	$V_4, V_5$	$V_4 = V_4 + V_5$ $V_5 = V_5 + V_4$	$= 2n + 1$	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
5	$+ V_{11} + V_{12}$	$V_{11}, V_{12}$	$V_{11} = V_{11} + V_{12}$ $V_{12} = V_{12} + V_{11}$	$= \frac{2n-1}{2} \cdot \frac{2n+1}{2} = A_0$	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
6	$- V_{13} - V_{14}$	$V_{13}, V_{14}$	$V_{13} = V_{13} - V_{14}$ $V_{14} = V_{14} - V_{13}$	$= -\frac{1}{2} \cdot \frac{2n-1}{2n+1} = A_0$	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
7	$- V_{13} - V_{14}$	$V_{13}, V_{14}$	$V_{13} = V_{13} - V_{14}$ $V_{14} = V_{14} - V_{13}$	$= -1 (= -3)$	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
8	$+ V_2 + V_3$	$V_2, V_3$	$V_2 = V_2 + V_3$ $V_3 = V_3 + V_2$	$= 2 + 0 = 2$	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
9	$+ V_2 + V_3$	$V_2, V_3$	$V_2 = V_2 + V_3$ $V_3 = V_3 + V_2$	$= \frac{2n}{2} = A_1$	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
10	$\times V_{11} \times V_{12}$	$V_{11}, V_{12}$	$V_{11} = V_{11} \times V_{12}$ $V_{12} = V_{12} \times V_{11}$	$= B_1 \cdot \frac{2n-1}{2} = B_1 A_1$	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
11	$+ V_{11} + V_{12}$	$V_{11}, V_{12}$	$V_{11} = V_{11} + V_{12}$ $V_{12} = V_{12} + V_{11}$	$= \frac{1}{2} \cdot \frac{2n-1}{2n+1} + B_1 \cdot \frac{2n-1}{2}$	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
12	$- V_{11} - V_{12}$	$V_{11}, V_{12}$	$V_{11} = V_{11} - V_{12}$ $V_{12} = V_{12} - V_{11}$	$= -2 (= 2)$	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
13	$- V_4 - V_5$	$V_4, V_5$	$V_4 = V_4 - V_5$ $V_5 = V_5 - V_4$	$= 2n - 1$	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
14	$+ V_4 + V_5$	$V_4, V_5$	$V_4 = V_4 + V_5$ $V_5 = V_5 + V_4$	$= 2 + 1 = 3$	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
15	$+ V_4 + V_5$	$V_4, V_5$	$V_4 = V_4 + V_5$ $V_5 = V_5 + V_4$	$= 2n - 1$	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
16	$\times V_4 \times V_5$	$V_4, V_5$	$V_4 = V_4 \times V_5$ $V_5 = V_5 \times V_4$	$= \frac{2n-1}{2} \cdot \frac{2n-1}{2} = A_1$	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
17	$- V_4 - V_5$	$V_4, V_5$	$V_4 = V_4 - V_5$ $V_5 = V_5 - V_4$	$= 2n - 2$	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
18	$+ V_4 + V_5$	$V_4, V_5$	$V_4 = V_4 + V_5$ $V_5 = V_5 + V_4$	$= 3 + 1 = 4$	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
19	$+ V_4 + V_5$	$V_4, V_5$	$V_4 = V_4 + V_5$ $V_5 = V_5 + V_4$	$= 2n - 2$	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
20	$\times V_4 \times V_5$	$V_4, V_5$	$V_4 = V_4 \times V_5$ $V_5 = V_5 \times V_4$	$= \frac{2n-1}{2} \cdot \frac{2n-1}{2} = A_1$	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
21	$\times V_{11} \times V_{12}$	$V_{11}, V_{12}$	$V_{11} = V_{11} \times V_{12}$ $V_{12} = V_{12} \times V_{11}$	$= B_1 \cdot \frac{2n-1}{2} = B_1 A_1$	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
22	$+ V_{11} + V_{12}$	$V_{11}, V_{12}$	$V_{11} = V_{11} + V_{12}$ $V_{12} = V_{12} + V_{11}$	$= A_0 + B_1 A_1 + B_2 A_2$	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
23	$- V_{11} - V_{12}$	$V_{11}, V_{12}$	$V_{11} = V_{11} - V_{12}$ $V_{12} = V_{12} - V_{11}$	$= -3 (= 1)$	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Here follows a repetition of Operations thirteen to twenty-three.																						
24	$+ V_{11} + V_{12}$	$V_{11}, V_{12}$	$V_{11} = V_{11} + V_{12}$ $V_{12} = V_{12} + V_{11}$	$= B_1$	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
25	$+ V_{11} + V_{12}$	$V_{11}, V_{12}$	$V_{11} = V_{11} + V_{12}$ $V_{12} = V_{12} + V_{11}$	$= n + 1 = 4 + 1 = 5$	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	

Augusta Ada King, Countess of Lovelace (ADA is named after her)

# First Generation of Computers (1940-56)



(**ENIAC**: 17,468 vacuum tubes, 7,200 crystal diodes, 1,500 relays, 70,000 resistors, 10,000 capacitors and around 5 million hand-soldered joints)



(Vacuum tube)



(Magnetic drums)

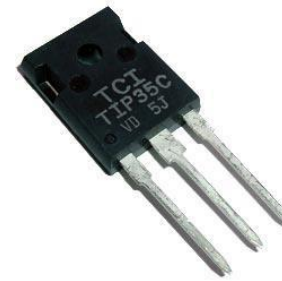
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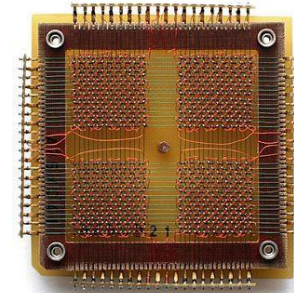
# Second Generation of Computers (1956-63)



(IBM 1620, PDP8, CDC 1604)



(Transistors)



(Magnetic core for primary memory)

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(Stored Program Computers: John Von Neumann)

# Third Generation of Computers (1964-71)



(IBM 370)



(PDP-11)



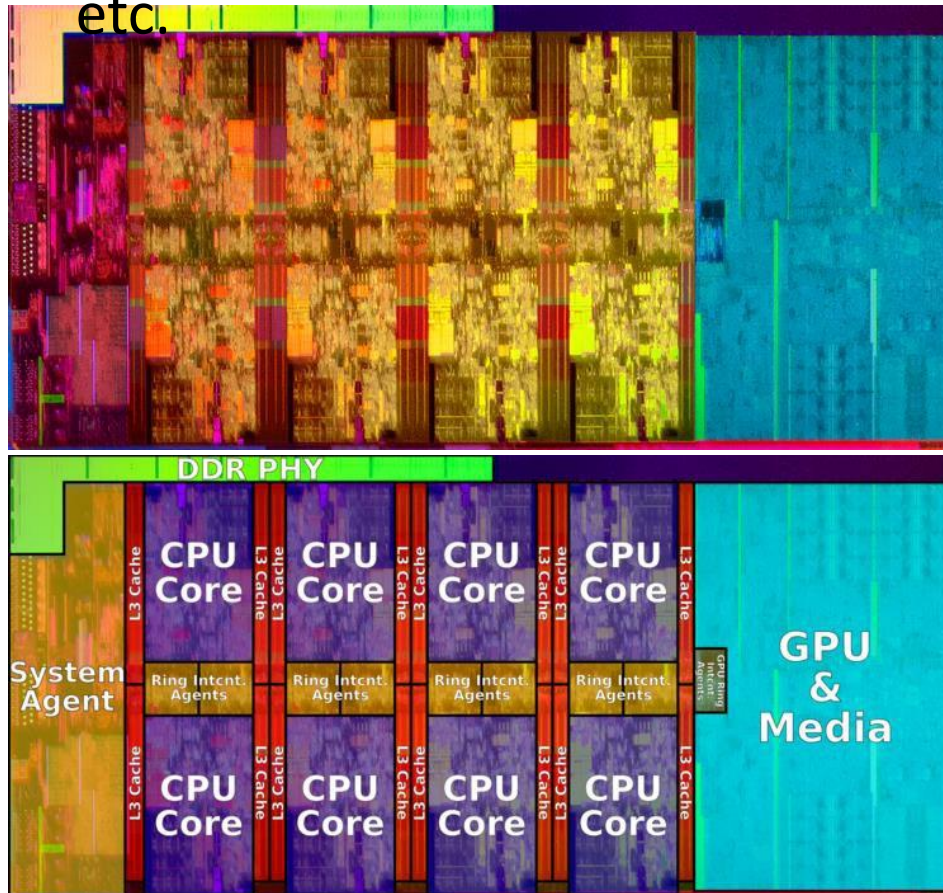
IC: transistors, diodes, and  
registers; KBs; Monitors

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# Fourth and Fifth

## Generations

LLM, VR, AR, WAN, GUI, Games, Perceptual computing, GPUs, Superscalar arch's, Artificial Intelligence etc.









# What is a Computer?

- Processor: **brain**
- Memory: **scratch paper**
- Disk: **a note book**
- I/O:  
**communication**  
(senses)
- Software: **reconfigurability**



pixta.com - 00007420

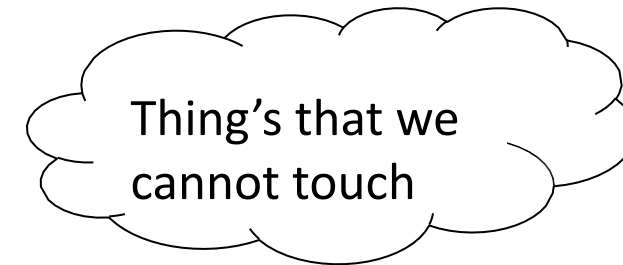
A **computer** is a electromechanical device which can be programmed to change (process) information from one form to another.

# What is a Computer ?

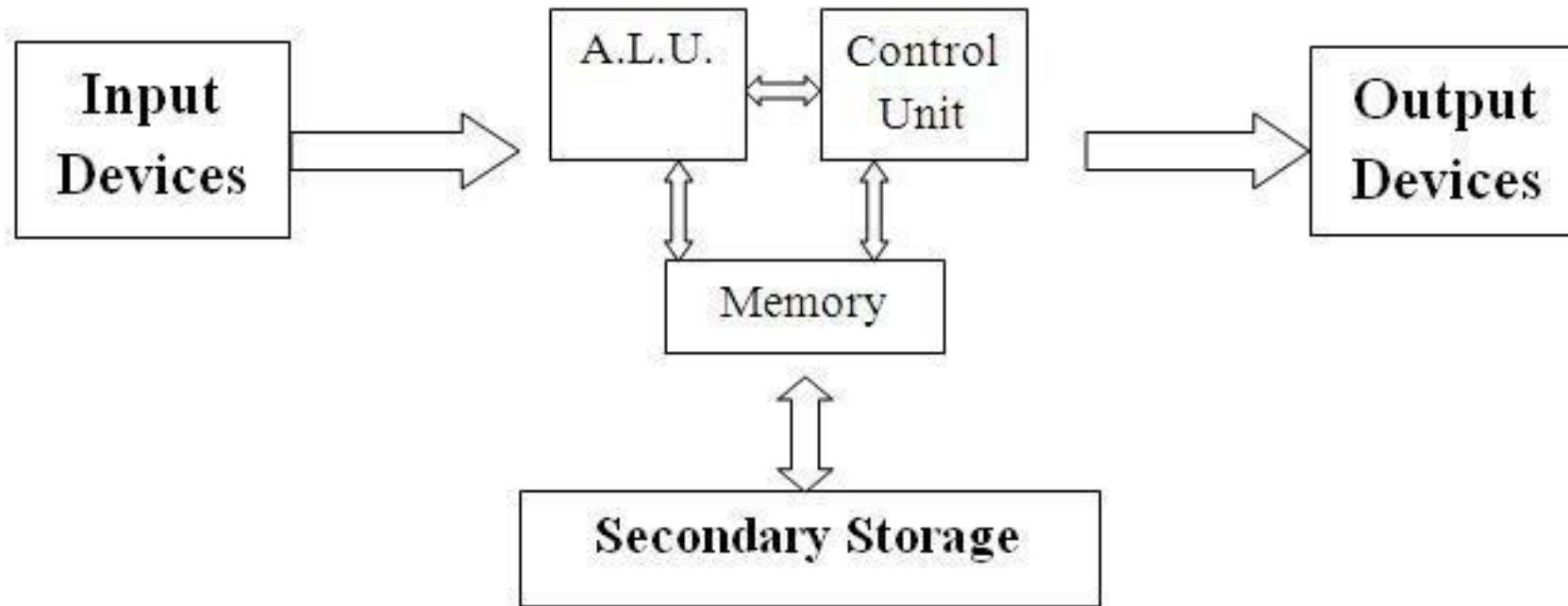




## ◆ A computer system includes **hardware** and **software**



# Hardware



# Input Device



## Input: Sending Data to the Computer





# Output Device



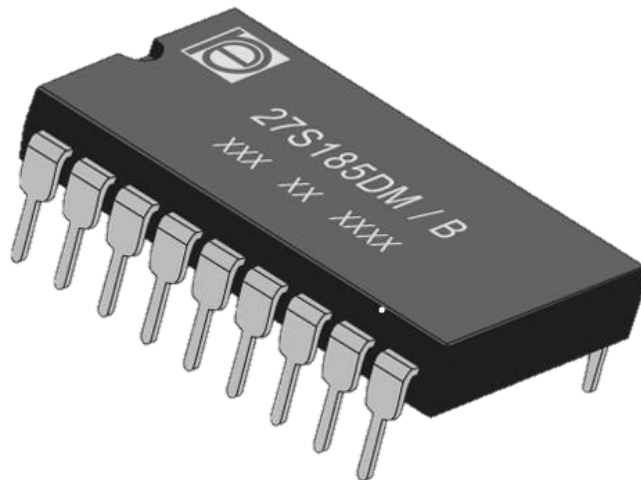
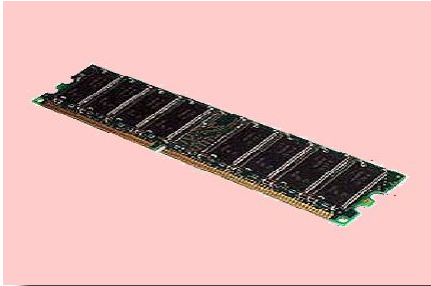
**Output:** Displaying Information to user



# Primary Memory



## Random Access Memory– RAM



## Cache Memory – L1 , L2 cache



## Read Only Memory– ROM

# Secondary Storage Memory



**Hard Disk Drive**



**Flash Drive**



**Compact Disc**



**SD Memory Card**

