

COSC 117

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What is a Computer?



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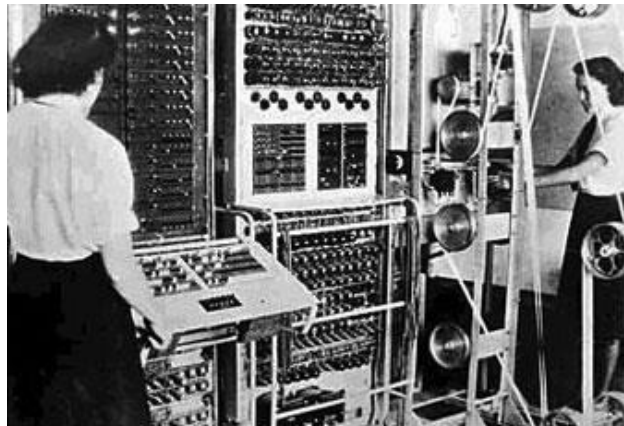
What is a Computer?



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COLOSSUS - First *electric* Programmable Computer - Tommy Flowers (first demonstrated in 1943)

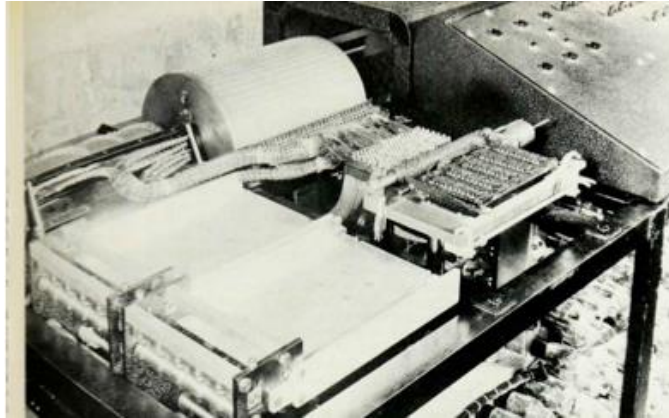


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ATANASOFF-BERRY COMPUTER (ABC)

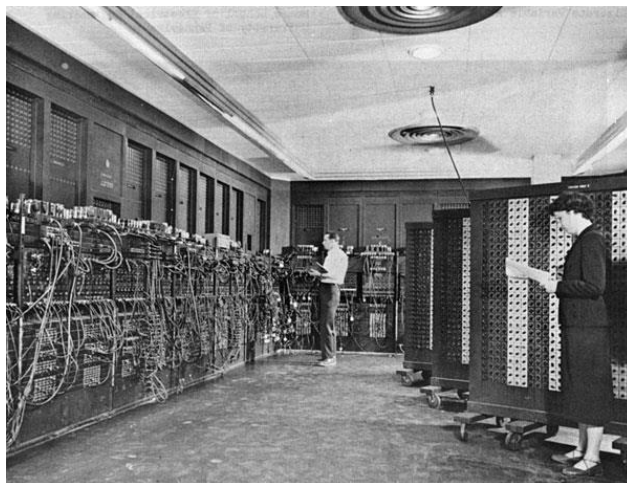
First *Digital* Computer (1942)
at Iowa State



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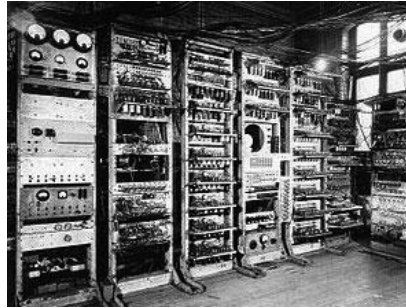
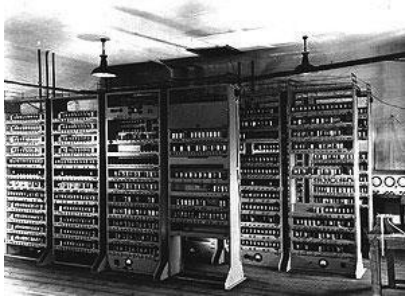
ENIAC 1 – First *fully functional* Digital Computer (1946)



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EDSAC (“Baby”)– First *stored program* Computer (1949)



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Hardware

“The parts that can be kicked” —Henri Karrenbeld

- CPU (central processing unit)
- Input/output devices
- Primary memory (RAM)
 - Volatile, temporary, lost when turned off
- Secondary memory
 - hard-disk, USB drive, CD/DVD
 - permanent, even without power

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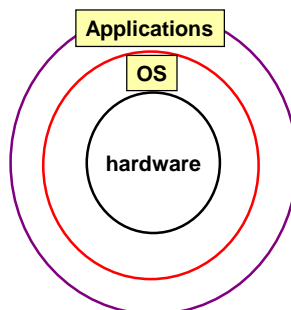
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What can go wrong with hardware?

- Memory, disks, CD-ROM drives, floppy drives, video cards, mother boards, CPUs, fans, power supplies, monitors, disk controllers can all FAIL!
- Physical devices degrade over time.
- Although it is rare, chips can make calculation errors due to design flaws – E.g., Intel Pentium math coprocessor (circa 1994)

Software

- Instructions (programs)
 - Applications
 - Operating Systems (OS)
 - Windows, Mac OS, Unix, Linux, ...



What can go wrong with software?

- Software can contain errors (“bugs”) that cause unpredictable or incorrect behavior
- http://www.computerworld.com/s/article/9183580/Epic_failures_11_infamous_software_bugs



Ariane 5, flight 501

http://www.youtube.com/watch?v=gp_D8r-2hwk

- Malicious software can be very hard to detect
 - viruses, worms
 - software that fails with competitors’ products

Why take Computer Science?

“Computing is not about computers anymore. It is about living.” – Nicholas Negroponte