
CS120 The Information Era

LECTURE 2

TOPICS: Survey Results, Review,
Computer Basics, Computer History,
Network History

Survey Results

- Computer OS: Feel comfortable with these operating systems
 - MAC (6/18 or 33%)
 - WIN (17/18 or 94%)
 - Unix (0/18 or 0%)
- Programming:
 - Java (0/18 or 0%)
 - C/C++ (4/18 or 22%)
 - BASIC (4/18 or 22%)
 - JAVASCRIPT (1/18 or 5%)
 - HTML (28/18 or %)
- Computer Hardware at Home:
 - MAC (4/18 or 22%)
 - PC (11/18 or 61%)

Survey Results

- Majors:
 - BUSINESS (10/18 or 56%)
 - ECONOMICS (2/18 or 11%)
 - MEDIA ARTS (4/18 or 22%)
 - PSYCHOLOGY (2/18 or 11%)
 - POLSCI (1/18 or 5%)
 - EXERCISE SCIENCE (1/18 or 5%)
 - BIOLOGY (1/18 or 5%)

Survey Results

- Things that you would most like to get from this course:
 - WEB PAGE CONSTRUCTION (MOST COMMON RESPONSE)
 - NETWORKING
 - MAC OS
 - PROGRAMMING
 - HTML

Bits and Bytes: Review

- What is a bit? What is a byte?
 - Kilobyte?
 - Megabyte?
 - Gigabyte?
- What is ASCII?
- What are files?
 - Characters stored in a text file are usually one byte.

Approximate sizes

- One page text 5KB
- One color cartoon 50KB
- One high-resolution photo 500KB
- One floppy disk 1.44MB
- 3 Minutes of music (MP3) 3 MB
- One medium sized website 50MB
- One Standard ZIP disk 100 MB
- 3 minutes of video 400 MB
- One CD-ROM 640 MB
- One hard drive 20-100GB
- One DVD 4.7 - 17 GB

MP3

- What is it?
- Why is it revolutionary?

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Storing Music

- 3 minutes of music
 - Uncompressed: 45 MB
 - Compressed: 3 MB
- 10 GB hard drive
 - store 15 audio CDs uncompressed
 - store 200 audio CDs compressed

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Computer History

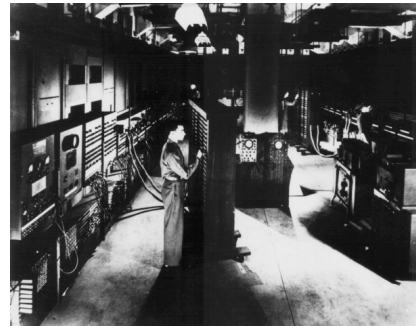
- The ENIAC: The first operational electronic general purpose computer (1946)
 - Electronic Numerical Integrator and Calculator
 - Moore School at University of Penn.
 - Used for computing artillery firing tables
 - U-shaped, 80 feet long by 8.5 feet high by several feet wide
 - 18,000 vacuum tubes
 - Funded by US Government: \$500,000

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Computer History: ENIAC



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Computer History (cont.)

- Several large machines followed
 - Programmed by switches, plugs and punch cards
 - Very expensive to own and run
 - Many users of one system
 - Difficult to program

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Computer History (cont.)

- In the mid to late 70's, the personal computer (PC) was born
 - Technology was cheap enough to build a computer meant for one
 - Concentrate on making it easy to use

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PC's

- Apple computer was first
 - Apple II was the first big commercial success
 - <http://www.uriah.com/apple-qt/1984.html>
- IBM wound up being more successful
 - Used Intel chips
 - Used Microsoft software (DOS and programming languages)
 - These machines and “clones” have become what we call PC's today

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PC vs. Mac

- Misnomer: PC stands for personal computer
- Personal computers are both PC's and Mac's
- PC comes from shortened version of “IBM compatible PC”
 - IBM built PC to compete with Apple
 - Made with Intel processor, Microsoft OS and software
 - Open architecture ⇒ many other companies besides IBM

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PC Basics

- Operating system (OS)
 - Software that controls all aspects of the computer system
 - Starts when turn on computer
- Different OS's
 - Microsoft Windows
 - Mac OS
 - Linux/Unix
 - Palm OS

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CPU

- Brain of computer
- Executes instructions and performs calculations
- Microprocessors hold CPU unit in personal computers
 - Pentium IV, Xenon, Celeron (INTEL)
 - UltraSPARC III (SUN)
 - G4, G5 (APPLE)

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CPU

- 3 characteristics of the CPU
 - clock speed
 - instruction set
 - bandwidth

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1. Clock speed

- How many instructions per second it executes
- Given in megahertz (MHz): one million cycles per second
 - cycle: smallest time unit
 - 800 MHz: 800 million cycles per second
- One instruction can execute in one cycle, but sometimes more

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1. Clock speed (cont.)

- Moore's law: computers double in speed every 18 months at no additional cost
- Can you determine the Clock Speed of your computer?

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2. Instruction Set

- Instructions execute all functions
- Different for different chips
- Can simulate instruction set of different computer, but slower

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3. Bandwidth

- Amount of data that can move around within a computer
- CPU, instruction sets, network connection all affect bandwidth
- Anything slow or small--bottleneck

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Networks and the Internet

- The internet is a network of computers networks
 - More specifics next lecture
- The communication links
 - phone lines
 - digital cables
 - optical fiber
 - satellite transmissions

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Speed by Connection Type

- MODEM: 56 kbps
- ISDN (Integrated Services Digital Network) 64-128 Kbps
- T1: 3.152 Mbps
- DSL (Digital Subscriber Line): 512 Kbps-8Mbps
- ETHERNET: 10Mbps
- CABLE MODEM: 512 Kbps-52 Mbps
- T3: 44.739 Mbps
- GIGABIT ETHERNET: 1 Gbps
- OC-256: 13.271 Gbps

• Check out www.bandwidthplace.com

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Internet History

- Department of Defense started ARPANet
- First came online in 1970
- NSFnet (started by National Science Foundation) started connecting universities to the internet in 1988
- Funding for new technology
 - IBM, MCI, MERIT
- Too big for government to subsidize

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Internet History

- First subscription-based, commercial Internet company, UUNET, was founded in 1987
- 1989 to 1991, the Internet took another great leap forward with the conceptualization and design of the World Wide Web by Tim Berners-Lee at CERN, the European Laboratory for Particle Physics, in Geneva
- Advanced Networks and Services built new backbone in 1992 (20x bandwidth) called ANSnet

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Internet History

- The first really friendly interface to the Internet was an online menu system called a gopher developed at the University of Minnesota, in 1991
- In 1993, Mark Andreesen launched Mosaic, the first easy-to-use Web browser at the National Center for SuperComputing Applications in Illinois. Andreesen soon went on to form Netscape, and released a new version of Mosaic called Navigator.

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Who's in charge?

- Federal Networking Council used to decide who got on the internet
- Before 1990, had to be sponsored by a government agency
- Federal Networking Council dropped the requirement
 - Opened door for commercialization!

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Continued

- No one really in charge--just some agencies that monitor
- FCC regulates billing practices of phone companies
- Self-regulated
 - Effective or like the Wild West?

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