# Lecture 4-2
Intellectual Property

Participation Quiz

- If you choose an answer to this question at random, what is the chance you will be correct?

    A. 25%

    B. 50%

    C. 33.3%

    D. 25%

Expanding the Argument to Intellectual Property

- The textbook considers the (fairly ridiculous) proposition: "Writing a play is akin to making a belt buckle"
- Belt buckle
  - Mine ore
  - Smelt it down
  - Cast it
- Writing a play
  - "Mine" words from English language
  - "Smelt" them into prose
  - "Cast" them into a complete play

Are We Convinced?

"To be or not to be, that is the question"
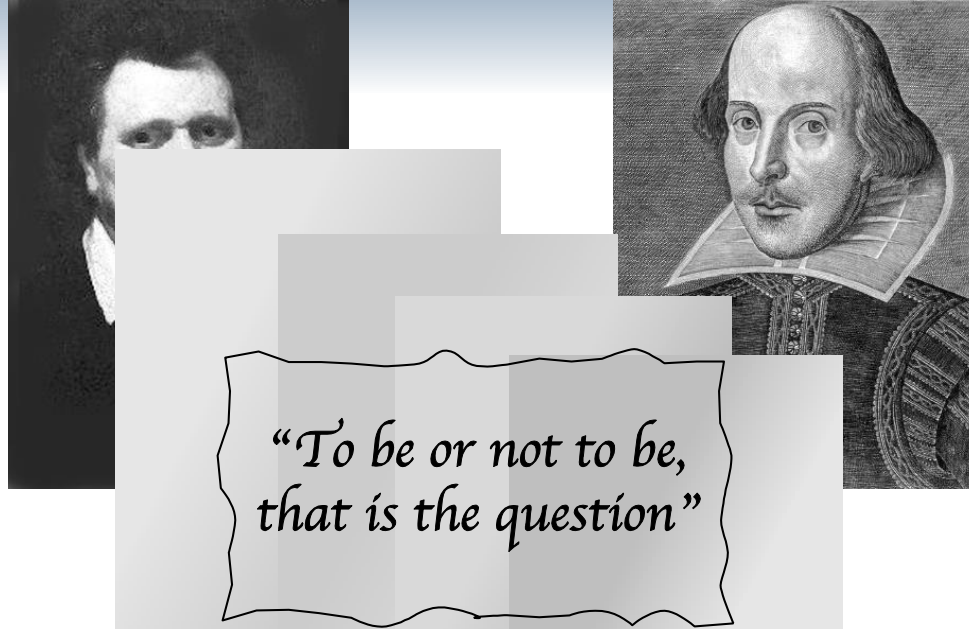
- If Ben Jonson and William Shakespeare simultaneously write down Hamlet, who owns it?
  - If that sounds far-fetched, two modern artists who paint a canvas blue
  - Two people can't have intellectual property rights to the same idea, even if they both had it independently
- If Ben "steals" the play from Will, both have it
  - Unlike a belt buckle, stealing doesn't deny ownership to the owner

Intellectual Property Protection

- So, why Intellectual Property Protection?
  - Some people are altruistic; some are not
  - Allure of wealth can be an incentive for speculative work
  - Thus, benefits to intellectual property protection
- But, these rights should come with limits
  - Giving creators rights to their inventions stimulates creativity
  - Society benefits most when inventions in public domain
  - Strike a compromise by giving authors and inventors rights for a limited time
- It might make more sense to call it "intellectual monopoly" rather than "intellectual property"

1. Trade Secret

- Confidential piece of intellectual property that gives company a competitive advantage

- Never expires

- No legal protection

- Reverse engineering allowed

- May be compromised when employees leave firm

2. Trademark, Service Mark

- Trademark: Identifies goods
- Service mark: Identifies services
- Company can establish a "brand name"
- Does not expire
- If brand name becomes common noun, trademark may be lost
- Companies advertise to protect their trademarks
- Companies also protect trademarks by contacting those who misuse them
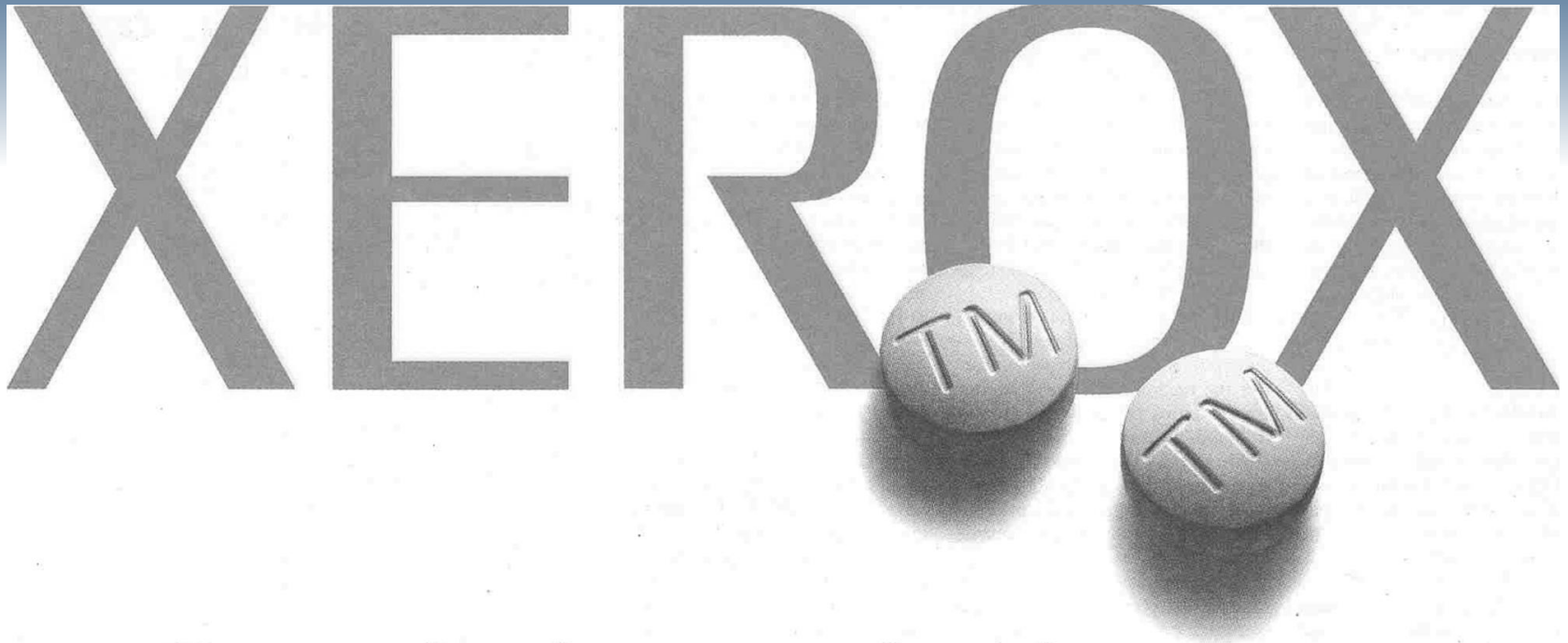
When you use "Xerox" the way you use "aspirin," we get a headache.
There's a new way to look at it.

Boy, what a headache! And all because some of you may be using our name in a generic manner. Which could cause it to lose its trademark status the way the name "aspirin" did years ago. So when you do use our name, please use it as an adjective to identify our products and services, e.g., Xerox copiers. Never as a verb: "to Xerox" in place of "to copy," or as a noun: "Xeroxes" in place of "copies." Thank you. Now, could you excuse us, we've got to lie down for a few minutes.

THE DOCUMENT COMPANY
XEROX.

3. Patent

- A public document that provides detailed description of invention

- A government office decides whether the invention is novel, non-obvious

- Provides owner with exclusive right to the invention

- Owner can prevent others from making, using, or selling invention for 20 years

Software Patents

- Patent protection began in 1981
- Inventions can be patented, but not algorithms
- Patent Office having a hard time determining prior art
- Result: some bad patents have been issued
  - Amazon One-Click purchasing
  - Apple: squares with rounded corners
- General skepticism about value of software patents

- *Patent trolls: what are they? What do you think?*
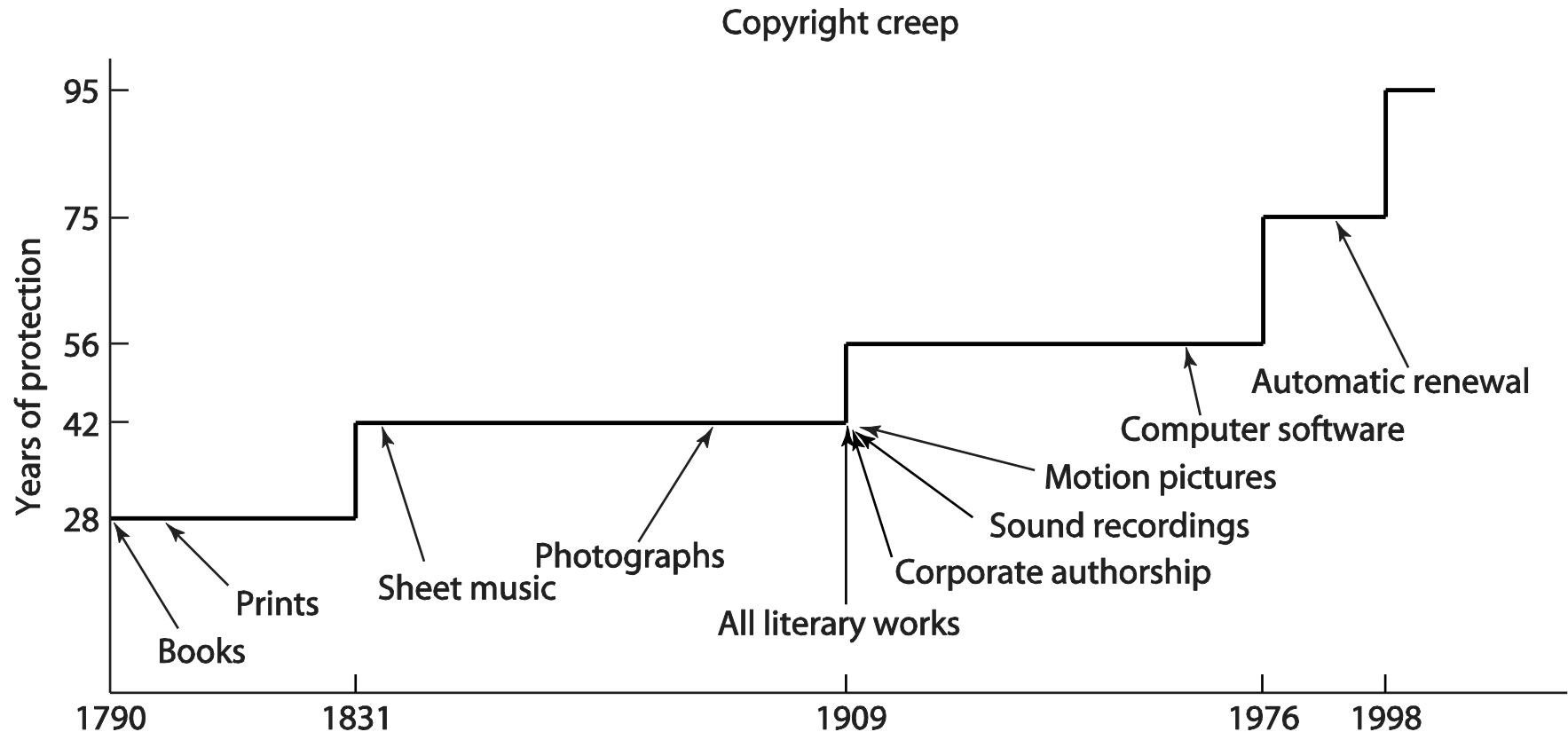
4. Copyright

- Provides owner of an original work five rights
  - Reproduction
  - Distribution
  - Public display
  - Public performance
  - Production of derivative works
- Copyright-related industries represent 5% of U.S. gross domestic product (> $500 billion/yr)
- Copyright protection has expanded greatly since 1790

Software Copyrights

- Copyright protection began 1964
- What gets copyrighted?
  - Expression of idea, not idea itself
  - Object program, not source program
- Companies treat source code as a trade secret
- Violations of copyright
  - Copying a program to give or sell to someone else
  - Preloading a program onto a computer being sold
  - Distributing a program over the Internet
- Important court cases
  - Apple Computer v. Franklin Computer
    - Established that object programs are copyrightable
  - Sega v. Accolade
    - Established that disassembling object code to determine technical specifications is fair use

Copyright Creep

- Since 1790, protection for books extended from 28 years to 95 years or more
  - latest extension done to prevent Disney characters from becoming public domain?
- Copyright Term Extension Act of 1998 challenged as unconstitutional
- U.S. Supreme Court disagreed: CTEA does not create perpetual copyrights

Copyright creep

Digital Millennium Copyright Act

- First big revision of US copyright law since 1976
- Brought US into compliance with Europe
- Extended length of copyright
- Extended copyright protection to music broadcast over Internet
- Made it illegal for anyone to
  - Circumvent encryption schemes placed on digital media
  - Circumvent copy controls, even for fair use purposes

Digital Rights Management

- Actions owners of IP take to protect their rights

- Approaches
  - Encrypt digital content
  - Digital marking so devices can recognize content as copy-protected

- Example: the (failed) Secure Digital Music Initiative (2000)
  - Consortium didn't stick together
  - Cracked by CS researchers

- Example: Sony BMG Rootkit (2005)
  - Made everyone angry; retracted

- Example: online music stores (2003—2009)
  - Started out with DRM, in part to lock people into platforms
  - Lately, moving away from it

DRM Example: Encrypting DVDs

- Contents of DVDs encrypted using Content Scramble System (CSS)

- Need decryption keys to view a DVD

- Jon Johansen wrote a decryption program for Linux

- 2600 Magazine published the code

- Motion picture studios sued 2600 Magazine and won

- Johansen tried in Norway and found not guilty

DRM Example: Foiling HD-DVD Encryption

- Hardware, software, and entertainment companies created Advanced Access Content System to encrypt HD-DVDs

- Encryption key posted on Digg.com
  - AACS leaned on Digg.com to censor postings containing key
  - Digg users fought back
  - AACS "expired" the key and issued a new one
  - A month later, a Digg user posted the new key