

CPSC 430

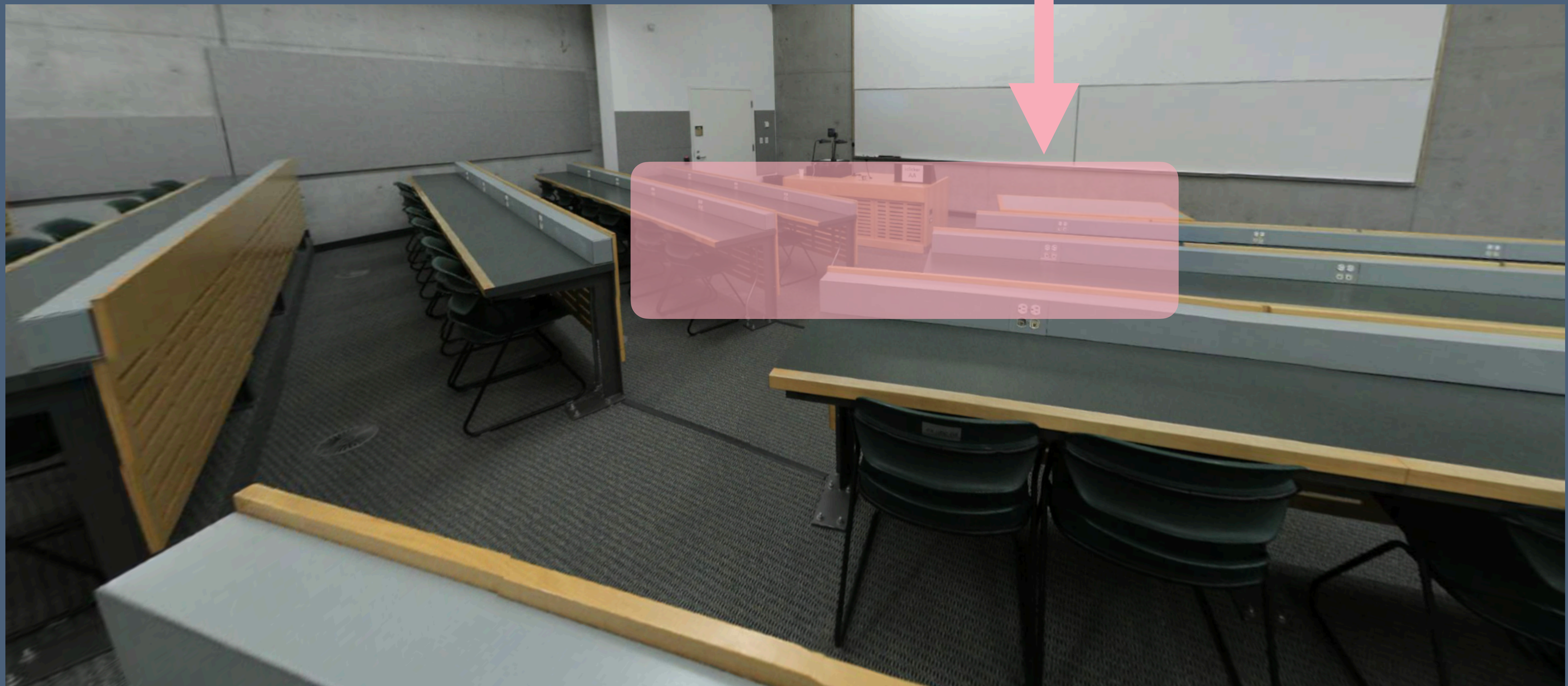
Computers & Society

Class 3A: Intellectual Property (Chapter 4)

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Slides courtesy of Dr. Kevin Leyton-Brown

**If you know you are soft-spoken, sit
here so I can give you a mic so you
don't have to scream!**



Class Outline

1. Announcements (10 mins)
2. Introduction to Intellectual Property (30 mins)
3. Activity: Reasonable IP Protections (30 mins)
4. Break (5 mins)
5. Protection of Intellectual Property (60 mins)
6. Reminders before next class (5 mins)

7. Next Class: Debate (!)

Announcements

Reminders

- Reading Quiz 3 was about Chapter 2 readings because we “lost” one class on May 20th.
- Reading Quiz 3.5 was just released on Chapter 3 readings, it is due May 24th at 6 PM
 - This used to be RQ4 but was renamed to RQ 3.5 so that RQ4 and EQ4 line up from here on out...
- Apologies for the rough start to due-dates in this course!
 - Things should be smoother from here on out.

Introduction to Intellectual Property

4.1 Introduction

- Value of intellectual property much greater than value of media
 - Creating first copy is costly
 - Duplicates cost almost nothing
- Illegal copying pervasive
 - Internet allows copies to spread quickly and widely
- In light of advances in information technology, how should we treat intellectual property?



What Is Intellectual Property?

- Intellectual property: any unique product of the human intellect that has commercial value
 - Books, songs, movies
 - Paintings, drawings
 - Inventions, chemical formulas, computer programs
- Intellectual property \neq physical manifestation

Let's step back from IP and consider basic property rights...

- **Locke: People have a right...**
 - to property in their own person
 - nobody should be allowed to enslave you
 - to their own labor
 - to things which they remove from nature through their labor
- **As long as...**
 - nobody claims more property than they can use
 - after someone removes something from nature, there is plenty left over



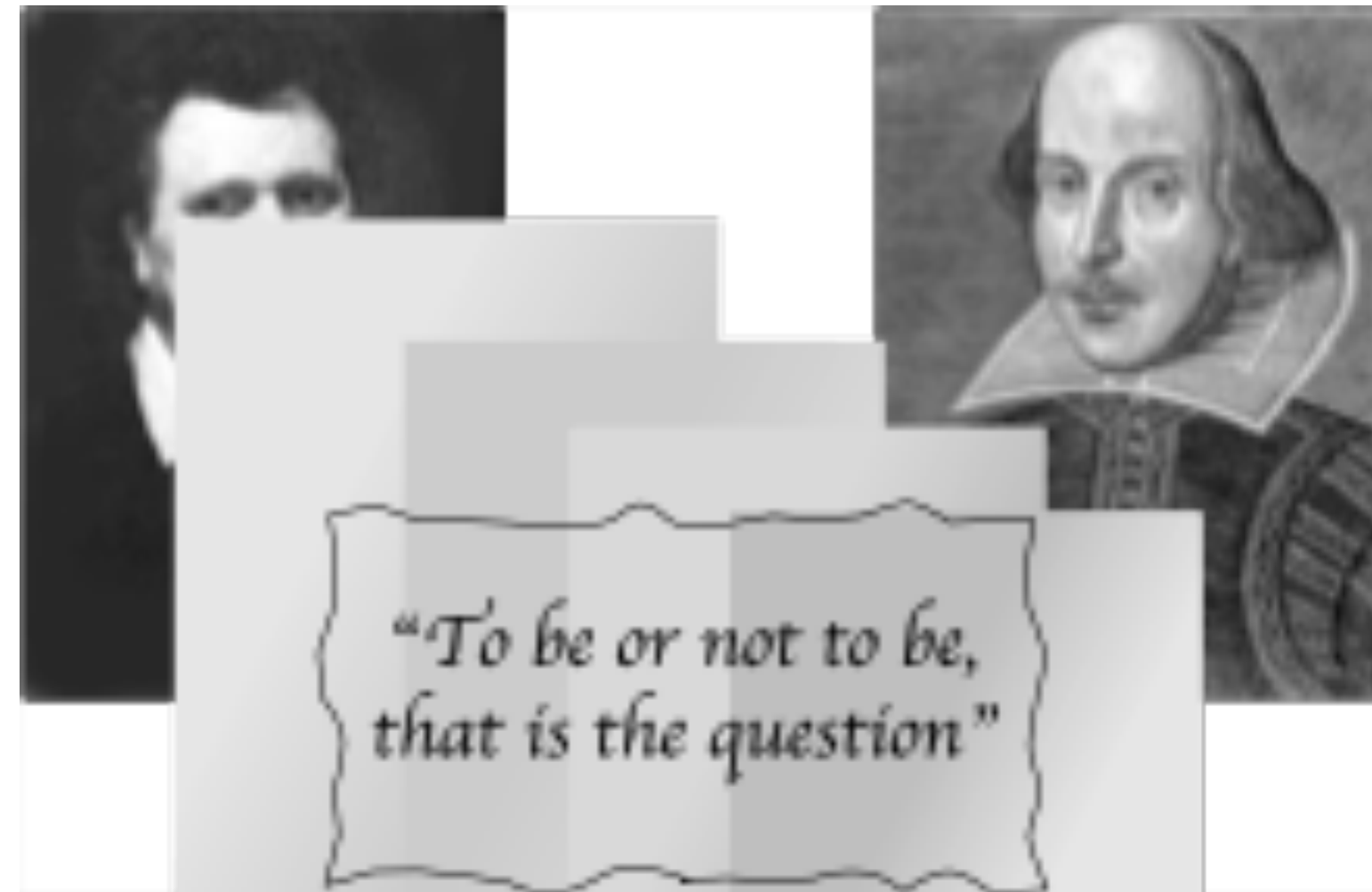
Property Rights

- This position is not uncontroversial:
- Pierre-Joseph Proudhon: “Property is Theft”
 - “The liberty and security of the rich do not suffer from the liberty and security of the poor; far from that, they mutually strengthen and sustain each other. The rich man’s right of property, on the contrary, has to be continually defended against the poor man’s desire for property.”
- Do you think property is a right?
If so, should the right have limits?

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

Discussion: Are We Convinced?



- 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

Activity: Reasonable IP Protections

Discuss in groups

- What protections for intellectual property are reasonable?
- What protections for intellectual property are unreasonable?
- What principles should we appeal to in answering these questions?

Protection of Intellectual Property

Intellectual Property Protection

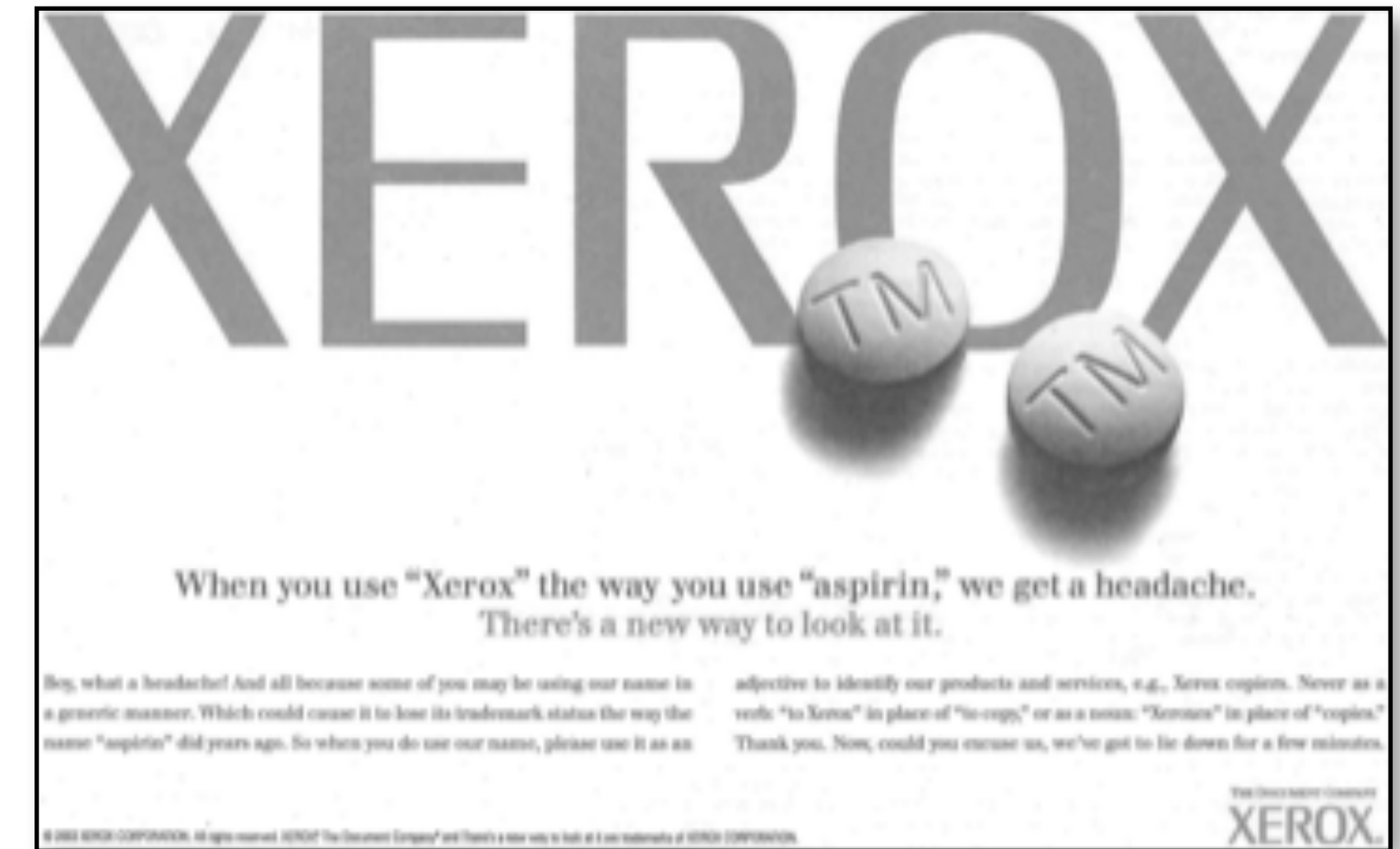
- So, why Intellectual Property Protection?
 - Some people are altruistic; some are not
 - Allure of wealth can be an incentive for speculative work
 - Thus, benefits to intellectual property protection
- But, these rights should come with limits
 - Giving creators rights to their inventions stimulates 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 “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



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

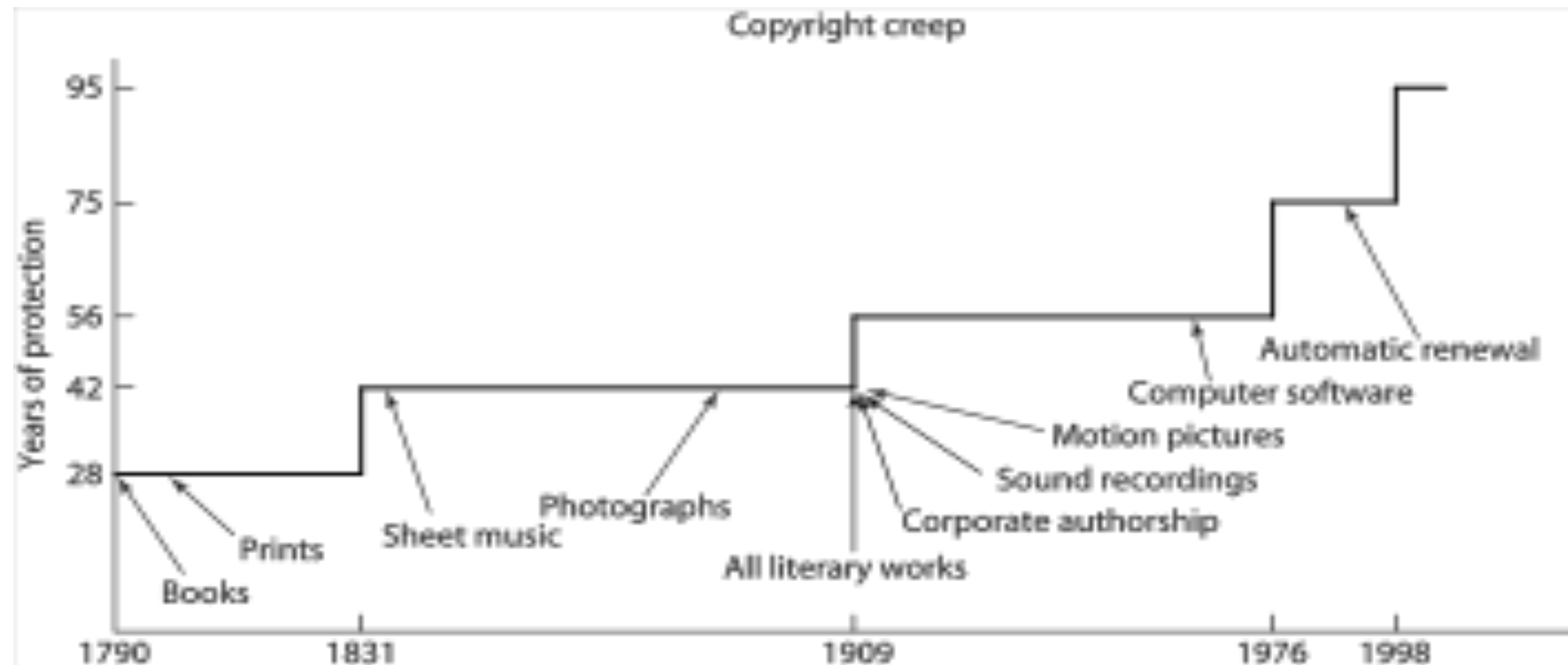
- Patent protection began in 1981
- Inventions can be patented, but not algorithms
- Patent Office having a hard time determining prior art
- Result: some bad patents have been issued
 - Amazon One-Click purchasing
 - Apple: squares with rounded corners
- General skepticism about value of software patents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

Copyright Creep

- Since 1790, protection for books extended from 28 years to 95 years or more
 - latest extension aims to protect Disney characters from entering public domain?
- Copyright Term Extension Act of 1998 challenged as unconstitutional
- U.S. Supreme Court disagreed: CTEA doesn't create perpetual copyrights



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
- Example: streaming sites (this decade)

Fair Use/Fair Dealing

USA: Fair Use

- Cases where copyrighted work can be reproduced without permission
- Use can be for any purpose
- Usage must be fair
 - Purpose, character of use
 - Nature of work
 - Amount of work copied
 - Effect on market for work

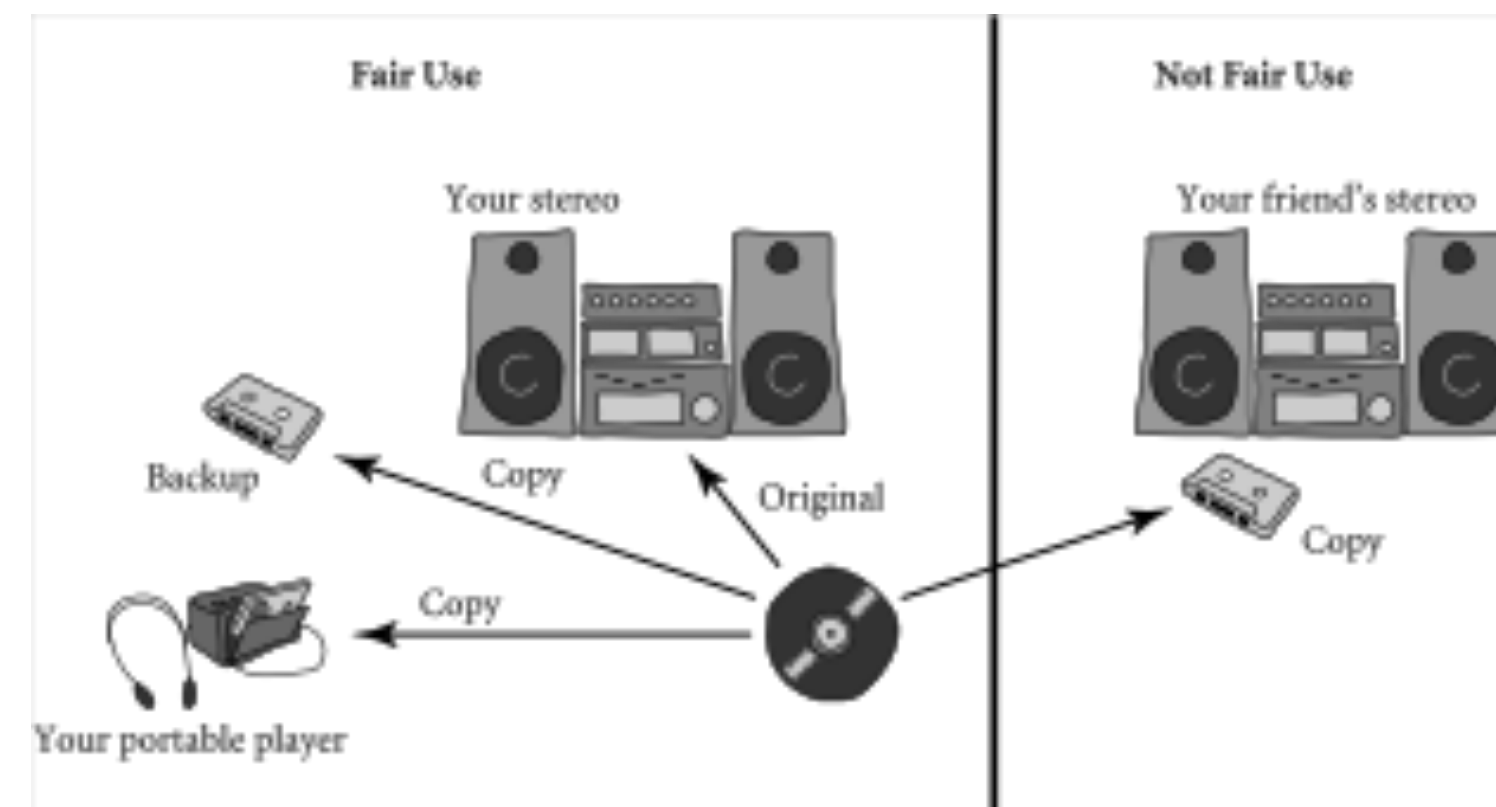
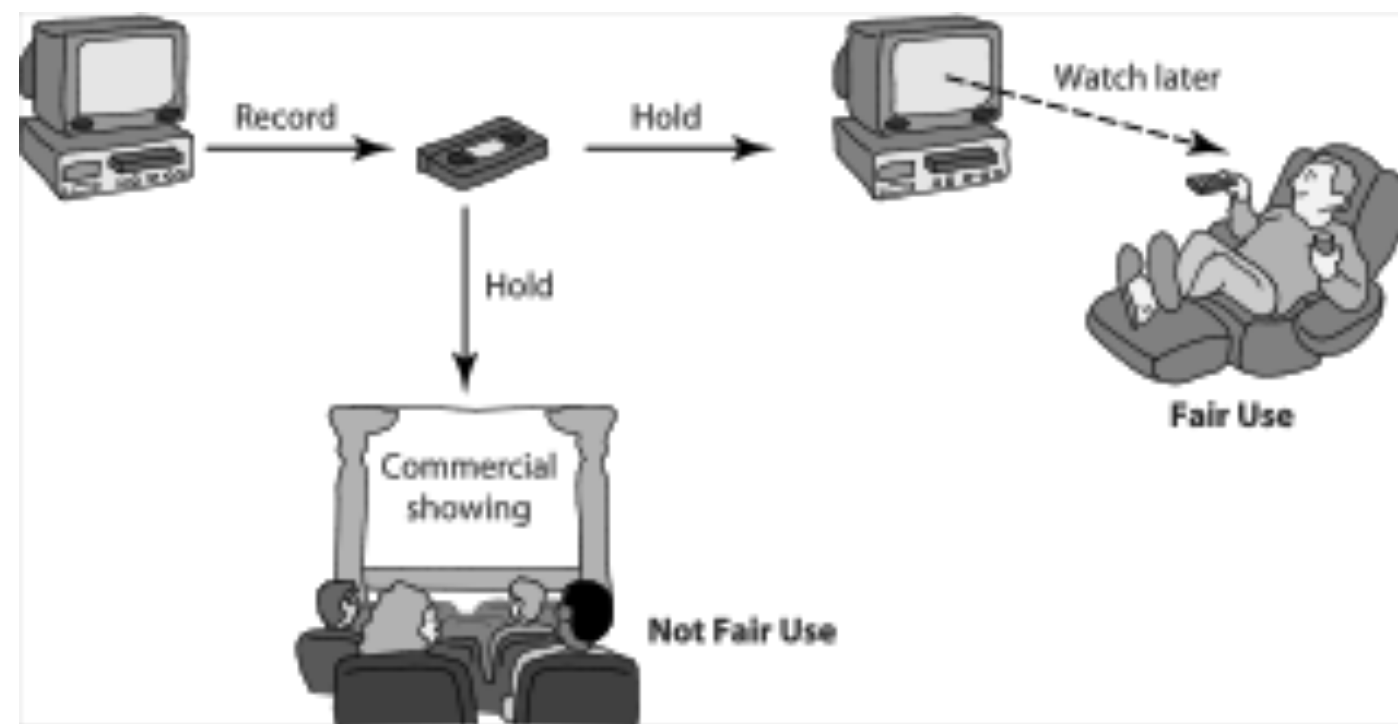
Canada: Fair Dealing

- Three protected activities:
 - research or private study
 - criticism or review
 - news reporting
- Usage must be fair
 - purpose (commercial/private)
 - character (e.g., was it an isolated incident?)
 - amount copied from the original
 - alternatives (was copying necessary?)
 - nature (e.g., public availability of copyrighted work)
 - effect (does copy compete with original?)

Is it ethical to break a digital lock in order to make fair use of a copyrighted work?

Some famous examples of fair use

- “Time shifting” (recording shows on VCR/DVR)
- “Space shifting” (transcoding music onto MP3 player)



- Use of image thumbnails in search results
- Google books – indexing full texts

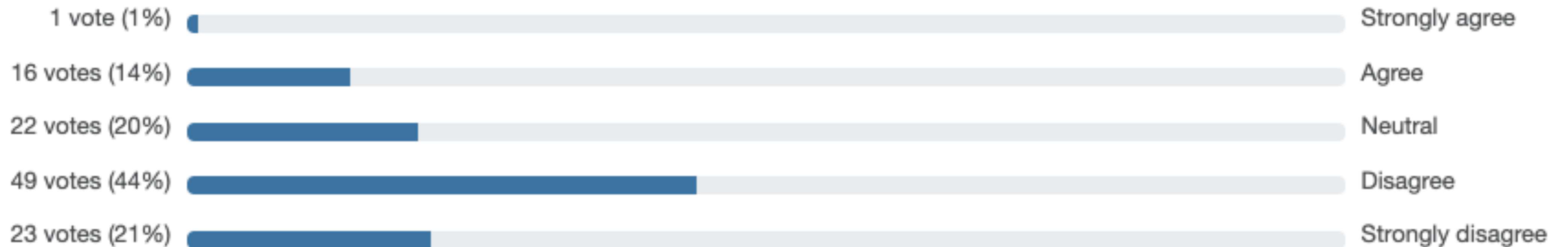
Legitimacy of IP Protection for Software

- Software licenses typically prohibit you from making copies of software to sell or give away
 - Our focus is not on whether it's ethical to violate such a legal agreement after having agreed to it.
- Instead, we are considering:
 - whether society *should* give IP protection to software
 - if so, how this protection ought to be limited
 - what ethical argument can be used to justify this protection.

Discussion: Intellectual Property

“The government should aggressively prosecute intellectual property infringement, particularly including peer-to-peer file sharing.”

A total of 111 voter(s) in 870 hours



Rights-based Analysis

- “Just deserts” argument
 - Programming is hard work that only a few can do
 - Programmers should be rewarded for their labor
 - Mixing my labor with something implies ownership
- Criticism of “just deserts” argument
 - Why does labor imply ownership?
 - Maybe mixing my labor with something means I lose my labor
 - Pour a can of tomato juice into the ocean: I don’t own the ocean
 - A society in which all labor went to common good could be just
 - Intellectual property not like physical property
 - I cut logs: I own the logs
 - I write a book: I get to restrict other people from copying the book
- *What do you think about this argument?*

Utilitarian Analysis

- **Argument against copying**

- Copying software reduces software purchases...
- Leading to fewer software producers...
- Leading to lower production of new software...
- Leading to fewer benefits to society



- **Each of these claims can be debated**

- Not all who get free copies can afford to buy software
- Open-source movement demonstrates many people are willing to donate their software-writing skills
- Hardware industry wants to stimulate software industry; freemium model; many apps are supported via ads
- Difficult to quantify how much society would be harmed if certain software packages weren't released

- *What do you think about this argument?*

Open Source

- **A variety of licenses. Some typical ingredients:**
 - No restrictions preventing others from selling or giving away software
 - Source code included in distribution
 - No restrictions preventing others from modifying source code
 - No restrictions regarding how people can use software
 - Same rights apply to everyone receiving redistributions of the software
- **GNU Project (Richard Stallman, 1984-)**
 - Goal: Develop open-source, Unix-like operating system
 - Most components developed in late 1980s
- **Linux**
 - Linus Torvalds wrote Unix-like kernel in 1991
 - Combined with GNU components to make an OS
 - putting pressure on Microsoft, Apple, and companies selling proprietary versions of Unix

Benefits and Drawbacks of Open Source

- **Benefits**

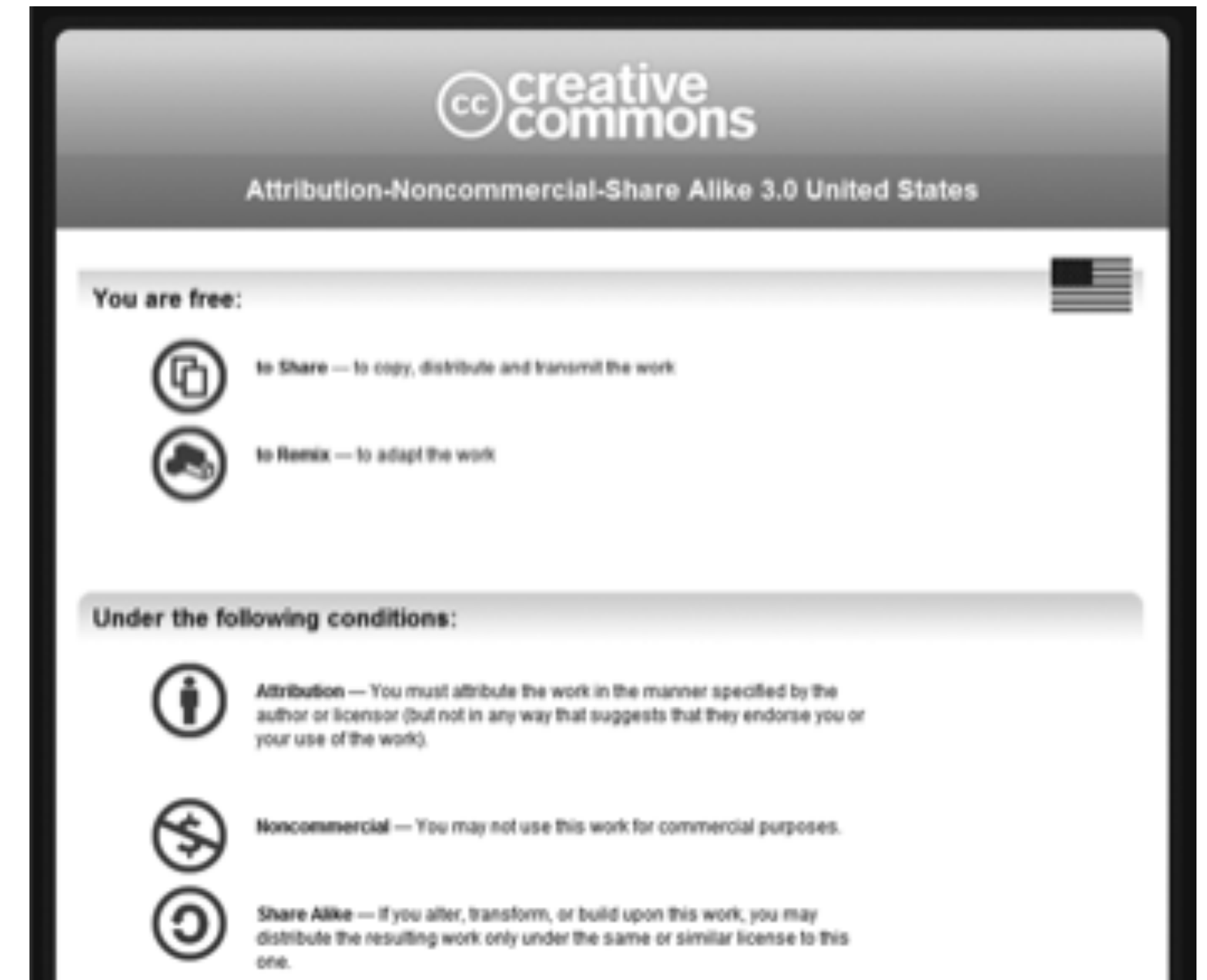
- Gives everyone opportunity to improve program
- New versions of programs appear more frequently
- Eliminates tension between obeying law and helping others
- Programs belong to entire community
- Shifts focus from manufacturing to service

- **Drawbacks**

- Without critical mass of developers, quality can be poor
- Without an “owner,” incompatible versions can arise
- Relatively weak graphical user interfaces
- Poor mechanism for stimulating innovation (no companies will spend billions on new programs)

Creative Commons

- Under current copyright law, eligible works are copyrighted the moment they are created
- No copyright notice does not mean it's ok to copy
- Must contact people before using work
- That slows down creative reuse
- Free Creative Commons license indicates
 - Which kinds of copying are ok
 - Which rights are being retained
- Flickr and Magnatune two well-known sites using Creative Commons licenses



Safe Software Development

- Reverse engineering okay
- Companies must protect against unconscious copying
- Solution: “clean room” software development strategy
 - Team 1 analyzes competitor’s program and writes specification
 - Team 2 uses specification to develop software
- Interestingly, same development strategies also used to ensure that open source licenses don’t “infect” commercial software

Next class: Debate!

Reminders before next class