

Digital Distribution

CSE 120 Spring 2017

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Administrivia

- ❖ Assignments:
 - Project Update in lab (5/25)
 - Innovation Comments (5/26)
 - Project (6/2)

- ❖ Wednesday: Computing in the Developing World

- ❖ Friday: Big Data
 - No Reading Check this week!

Peer Instruction Question

- ❖ What is the biggest impact of digitization?
 - Vote at <http://PollEv.com/justinh>
 - A. People need to learn about binary in schools**
 - B. Computers can now process data**
 - C. Information can be copied without loss**
 - D. There is no impact; it's a technicality**
 - E. Other: _____**

Biggest Impact of Digitization?

- ❖ Digital information can be copied *instantaneously* and *without loss*
 - Analog copying: almost always with loss
 - Biological copying: mutations and recombination



Copying is Easy

- ❖ `myCopy = myData;`
- ❖ File: right-click → Copy

- ❖ Lossless, instantaneous copying leads to a wealth of societal problems:
 - Privacy issues
 - Theft of private data
 - Interception of transmitted data
 - Persistence of digital data
 - Usage of digital works
 - Copyright
 - Legal, cultural, and economic impacts

Outline

- ❖ **Copyright and protection**
- ❖ Sharing and open-source
- ❖ Creative Commons

Digital Millennium Copyright Act (DMCA)

- ❖ Russel Rains – lawyer, professor at St. Edwards University in Austin, TX
 - <http://www.youtube.com/watch?v=bFLSe1qQUP8>



Intellectual Property (IP)

- ❖ **Intellectual property** is something produced by one's intellect
 - *e.g.* artwork, books, photos, music, poetry, performances, software
- ❖ Distribution, copying, and sale of a work is the *right of the creator*
 - It is illegal to copy someone else's creation for anything "other than personal use"
 - *You* are the creator of all that you create
 - Unless otherwise specified by a contract (*e.g.* at work)

Copyright: A Primer

- ❖ <http://www.youtube.com/watch?v=Uiq42O6rhW4>





Copyright Terminology Review

- ❖ **Copyright:** legal right granting creator of an original work *exclusive rights* over use and distribution
 - Set by laws of a *country*
 - **Public domain:** exclusive IP rights expired, forfeited, or inapplicable

- ❖ **Fair Use:** *right* to use copyrighted material without permission in specific circumstances
 - *e.g.* commentary, search engines, criticism, parody, news, scholarship
 - Judged based on (1) purpose/character of use, (2) nature of the work, (3) amount used, and (4) effect on work's value

Copyright Violations

- ❖ Most people who have posted on the Internet have probably violated copyright laws
- ❖ Illegal sharing of music and videos
 - Napster, Kazaa, DC++, Bittorrent
- ❖ Illegal sharing of games
 - ISO images of games (to be played on emulators)
- ❖ Illegal usage of photos and works
 - Posting without attribution, misrepresentation, plagiarism

Copyright and Laws

- ❖ Owners must “defend” their copyrights
 - RIAA and MPAA are at war with users

- ❖ As of 2016, only 4 members of Congress (all in the House) have CS degrees
 - Stop Online Piracy Act (SOPA) – 2011
 - Would have allowed court orders to bar access to websites with copyright infringement to advertising networks, payment facilities, and Internet service providers
 - Service blackout in 2012 by Wikipedia, Google, and others in protest
 - Protect Intellectual Property Act (PIPA) – 2011

Digital Rights Management (DRM)

- ❖ Technologies that are used to restrict usage of proprietary hardware and copyrighted works
 - Not universally accepted or used; can be inconvenient
- ❖ Software: Product (serial) keys
 - Internal algorithm checks validity of entered key
 - “Cracked” keys can fool the validity check
- ❖ Audio: non-standard CDs or restricted usage of downloaded music
 - Only playable with certain devices or applications
- ❖ Games: Persistent online authentication

Outline

- ❖ Copyright and protection
- ❖ **Sharing and open-source**
- ❖ Creative Commons



Copyleft

- ❖ Offering people the right to freely distribute copies and modified versions of a work with the stipulation that the same rights be preserved in derivative works down the line
 - <http://www.youtube.com/watch?v=u2k07BbPkDk>



Open-Source Licenses

- ❖ GNU General Public License (v2, v3)
 - ❖ Apache License
 - ❖ MIT License
 - ❖ BSD License
 - ❖ Public Domain
-
- These licenses differ in:
 - Attribution requirements
 - Commercial use restrictions
 - Derivative work restrictions

Why Open Source?

❖ Pros:

- Cheaper – free to install on all machines
- Crowd-sourced fixes and improvements
- Can persist beyond company that created it
- You can personally contribute and become part of the community

❖ Cons:

- Can be more difficult to use and support
- More potential security flaws

Open-Source Software

	Proprietary	Open-Source
Operating Systems	Windows, Mac OS	Linux, Android *
Web Browsers	IE/Edge, Safari,	Chrome *, Firefox
Email Client	Outlook	Thunderbird
Music Player	Windows Media Player, iTunes	VLC
Audio Editing	Cubase, Logic Pro	Audacity
Image Editing	Photoshop	GIMP
Text Editor	Word, Notepad, Sublime Text	Notepad++, Brackets

* includes some proprietary software for accessing Google services

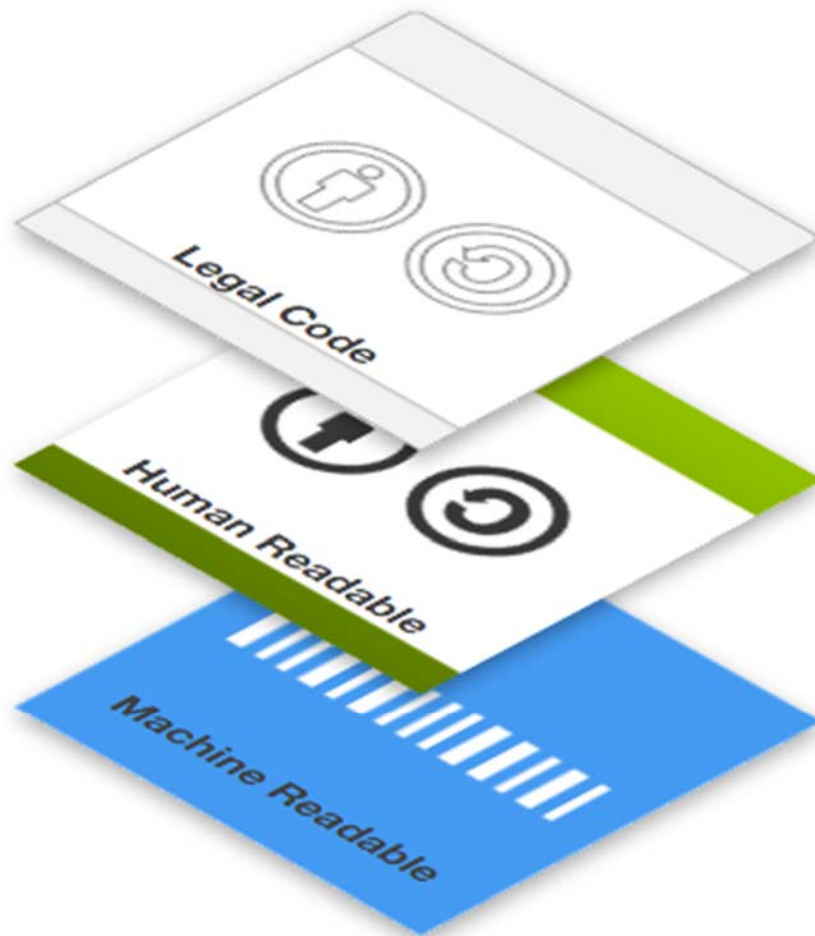
Outline

- ❖ Copyright and protection
- ❖ Sharing and open-source
- ❖ **Creative Commons**

Creative Commons



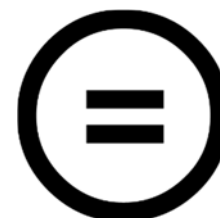
Layers of Creative Commons Licenses



- ❖ Legal layer
 - Sustain lawsuits
- ❖ Human-readable
 - Understandable for 'everybody'
- ❖ Machine-readable
 - Understandable for search engines

Creative Commons Symbols

- ❖ Attribution (BY)
 - Must give creator credit in derived/distributed works
- ❖ Noncommercial (NC)
 - Derived/distributed work can't be sold
- ❖ No Derivative Work (ND)
 - Must use AS IS
- ❖ Share Alike (SA)
 - Derivative works may be distributed *under the same license as this one*



Types of Creative Commons Licenses



CC vs. Open Source

- ❖ Creative Commons Licenses are **not** recommended for program code
 - Use open-source licenses instead

- ❖ CC does *not* account for:
 - Patents
 - License compatibility
 - Binary vs. source code case distinction

Social Implications

- ❖ <http://www.youtube.com/watch?v=Zi8cik98YmE>

