Digital Distribution
CSE 120 Winter 2020

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Quiz 2

• You will have 20 minute to complete the quiz.
• No outside materials are allowed – just your mind.
• If you have a question, raise your hand.
• Relax. You are here to learn 😊.

• Finish: 3:51
Administrivia

- Assignments:
  - Jumping Monster [submit] due tonight (1/31)
  - Creativity Planning (2/4)
  - Portfolio Update 1 due Wednesday (2/5)
  - Creativity Project (2/7)
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 issues:
  - Privacy issues
    - Theft of private data
    - Interception of transmitted data
    - Persistence of digital data
  - Usage of digital works
    - Copyright
    - Legal, cultural, and economic impacts
Prompts

Do you think the following are “right”? Legal? How have the rules changed in the digital vs. physical realm?

- Theft: Taking something from someone else without permission
- Giving a song that you purchased to your friends
- Your friend sends you a photo; you share it without asking
- Using an image you found on the Internet on your website (or as your profile picture)
Outline

- Copyright
- Sharing and open-source
- Creative Commons
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, education
  - Judged based on (1) purpose/character of use, (2) nature of the work, (3) amount used, and (4) effect on work’s value
Copyright Notes

- Applies to wide variety of works: articles, artwork, books, choreography, photos, podcasts, screenplays, software, songs
  - Does not apply to ideas, facts/data, or logos
- Copyright is automatically applied, even without the copyright symbol ©!
  - Once it is “captured in a fixed format”
- Copyright has a limited duration
  - Usually tied to life of creator
- Attribution is not a substitution for permission
Copyright Violations

- Why would people violate copyright?
  - Inadvertent – copying is too easy!
  - Inadvertent – unknown copyright status of material or misunderstanding of fair use
  - Financial – don’t want to pay
  - Financial – making money through clicks, views, and advertising
Copyright Violations

- Most people who have posted on the Internet have probably violated copyright laws at one point

- Illegal sharing of music and videos
  - Napster, Kazaa, DC++, BitTorrent

- Illegal sharing of games
  - ISO images of games (to be played on emulators)
  - “Cracked” versions of games

- Illegal usage of photos and works
  - Misrepresentation, plagiarism
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
Digital Millennium Copyright Act (DMCA)

- **Anti-circumvention provisions**
  - Illegal to attempt to circumvent DRM (even if copyright isn’t breached)
  - Often viewed as anti-tinkering
  - Proven to be rather toothless – circumvention still happens

- **Safe harbor provisions**
  - Protect “providers of online services” (e.g. ISPs, YouTube, Facebook) from being sued for copyright infringements of its users
  - DMCA Takedown Notice: copyright holders can request sites to remove or block access to material that violates their copyright
Most Effective Piracy Solution?

- Online Streaming!
  - Make it so convenient to stream content (video, music, games) that pirating seems unnecessary

![Logo images of various streaming services]

hulu
NETFLIX
amazon instant video
crunchyroll
PANDORA internet radio
YouTube
Spotify
STEAM
PlayStation Now
Copyright and Laws

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

- Stop Online Piracy Act (SOPA) – 2011, never voted on
  - 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

- As of 2016, only 4 members of Congress (all in the House) have CS degrees
The following slides are considered “extra” material – since we didn’t get to them in lecture, we won’t test you on them.

However, they’re left here in case you find them interesting.
Outline

- Copyright
- **Sharing and open-source**
- Creative Commons
Copyright and Software

- Copyright applies to software *source code*
  - Software is often distributed in *executable* form so that the source code is not viewable
  - *Proprietary software* has IP rights restrictions – copyright of source code or patent rights

- Rapid growth – developers wanted to share ideas and build more complex software
  - **Option 1**: grant permission on a case-by-case basis
  - **Option 2**: put software in the public domain

\(\uparrow\) works derived from public domain can be copyrighted, though
Copyleft

- Form of *licensing* that offers 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=u2k07BbPkJk](http://www.youtube.com/watch?v=u2k07BbPkJk)
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 Use 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
   - Can reduce possibility of security flaws

❖ Cons:
   - Can be more difficult to use and support
## Open-Source Software

<table>
<thead>
<tr>
<th>Category</th>
<th>Proprietary</th>
<th>Open-Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Systems</td>
<td>Windows, Mac OS</td>
<td>Linux, Android *</td>
</tr>
<tr>
<td>Web Browsers</td>
<td>IE/Edge, Safari</td>
<td>Chrome *, Firefox</td>
</tr>
<tr>
<td>Email Client</td>
<td>Outlook</td>
<td>Thunderbird</td>
</tr>
<tr>
<td>Music Player</td>
<td>Windows Media Player, iTunes</td>
<td>VLC</td>
</tr>
<tr>
<td>Audio Editing</td>
<td>Cubase, Logic Pro</td>
<td>Audacity</td>
</tr>
<tr>
<td>Image Editing</td>
<td>Photoshop</td>
<td>GIMP</td>
</tr>
<tr>
<td>Text Editor</td>
<td>Word, Notepad, Sublime Text</td>
<td>Notepad++, VS Code</td>
</tr>
</tbody>
</table>

* includes some proprietary software for accessing Google services
Outline

- Copyright and protection
- Sharing and open-source
- Creative Commons
Open Source for Non-Software?

- Copyright ≈ *all* rights reserved
  - What if you don’t want/need *all* rights?

- You can use a [Creative Commons license](https://creativecommons.org)
  - Maintained by Creative Commons non-profit organization, founded in 2001
  - Specify what uses you want to allow *without needing permission*
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

- **BY**: Attribution
- **BY-NC**: Attribution and Non-Commercial
- **BY-ND**: Attribution and No Derivatives
- **BY-SA**: Attribution and Share Alike
- **BY-NC-SA**: Attribution and Non-Commercial and Share Alike
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
Summary

- **Copyright** is intended to protect the rights to intellectual property by the owner
  - Often protected by Digital Rights Management software
  - Legal protections and implementations are still a “work in progress”

- **Open-source** licenses for software allow you to freely distribute your source code for use by others who agree to follow the same licensing rules

- For works that you would like to share, you can waive some of your rights using **Creative Commons** licenses