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Survey of Scripting Languages: Copyright and Ethics

As the world gets more connected and shared code is readily available, legal issues start to arise regarding what is stealing, unethical, or useful. For this reason, programmers need to be aware of copyrights. According to copyright.gov, a copyright is a protection offered by the government that is granted upon the creation of a work to the author. This is offered to prevent people from stealing a work for nonconsensual use or abuse of the technology. Copyrights last for 70 years after the owner's death. In context with business, it is recommended to register copyrights and create a licensing agreement. This especially important to coders' job security and profitability.

Even if a programmer does not reuse code, copyrighting will arise. Upon publication, a program becomes subject to copyright. This increases in complexity when other's code is added into the mix. Earlier this year there was a US Supreme Court case between where Google used Oracle's API to create a user interface for Android (Baskin, Joshua, et al). Because the reused code was overall beneficial to society and did not plagiarize the work, the court ruled in favor of Google.

Programmers also have ethical implications involved with copyrights. There are two main organizations that seek to create clarity in these situations. They are the Association for Computing Machinery (ACM) and the Institute of Electrical and Electronics Engineers (IEEE). The ethical standards provided by ACM and IEEE are very similar in format and content. However, ACM's Code of Ethics appears to be more comprehensive containing descriptions for

its main points. ACM explicitly states under their Code of Ethics that programmers should "respect copyrights, patents, trade secrets, license agreements, and other methods of protecting authors' works". IEEE's Code of Conduct only implicitly talks about copyrighting, but never explicitly. The Bible has something to say about "hasty" and often ill-conceived work. Proverbs 21:5 states "The plans of the diligent lead surely to abundance, but everyone who is hasty comes only to poverty" (ESV Bible). Protecting others property and your own are important for any professional.

A good way to protect intellectual property is the use of licensing agreements. These provide the scope and utilization of a product (Berman, Daniel, et al). The five types of agreements are public domain, permissive, LGPL, Copyleft, and proprietary. For the sake of creating programs for school permissive software license agreements will be used similar to the "Apache License". In this class online resources are often used for syntax. Some of which are in the public domain, but any published code is still copyrighted meaning and should be cited (Berman, Daniel, et al).

When a programmer reuses code they should be aware of intent. For example, a student may not get a chance to touch proprietary code or even play around with Copyleft code, but they are still responsible to following guidelines set out by the school, copyright laws, and either of the ethics codes above. In most cases students will not necessitate attribution of authors because the code will be used for syntax only. A student should never look up homework answers as this violates IEEE's Code of Conduct by not "improving technical skills". To think at a higher level for programming classes, one needs to formulate the answers without outside help.

When programmer is working for an employer, they are obligated to do what is best for society and for their employer. According to ACM's Code of Ethics, employees should "Respect

the work required to produce new ideas, inventions, creative works, and computing artifacts." Therefore, whenever one uses open-source projects or copy-pasted code, they are obligated to cite it. According to Stack Overflow, attributing a source requires crediting Stack Overflow to users, code linking the author's name and linking the original website question (Atwood, Jeff). In addition, the project's licenses must not conflict with the cited license. If the employee fails tp comply, it could result in lawsuits, discourage the original author, and on a societal level stop the production of new ideas. By stealing another's intellectual property can take away potential money, attribution, and charity from the creator.

An employer is obligated to promote good practice among employees and follow all laws, licensing agreements, and purchase code as necessary. They should not copy another company's ideas like the case between SAS Institute and World Programming Ltd (WPL). With legal grounding, WPL copied the idea behind the programs of SAS Institute and not the source code itself (Chee, Foo Yun). This is permissible under IEEE's Code of Conduct as it promotes "public good" by creating a competitive market. However, Professionals should seek to love their neighbors as themselves (ESV Bible, Matt. 19.19). This action, although permissible by IEEE, does not foster ethical behavior because it syphons another company's profit by copying their business model. This decreases SAS' profit and overall market share. If an employer is ever caught in a situation like this, they should appeal to the uncompromising standards of the Bible.

Following licensing agreements, crediting sources, and following ethical codes are an essential way to having a strong ethical basis. Lawsuits can be avoided, and a clear Christian witness can be held. Ultimately when these standards are practiced society benefits and computing professionals are more likely to produce good work. Ethics are vital to ensuring copyright use and innovation continues in programming for decades to come.

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