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### Ethical Concerns in Computer Science

When writing a program, the program's success rate is a notable factor to consider. In the vast majority of cases, the success rate does not have to be very high. However, it is arguably the most important aspect of a program in certain fields, like healthcare. A notable example of the importance of a program's success rate is the Therac-25. From June 1985 to January 1987, there were "six known accidents [involving] massive overdoses by the Therac-25" (Levenson & Turner, p.18). These accidents were caused by a software error present in the Therac-25's programming, and resulted in lethal doses of radiation being administered to patients. This incident and others beg the question: How do we determine the amount of testing that is necessary for a system?

Levenson & Turner discuss the testing that was done (and the testing that was not) throughout their report, stating that numerous basic software-engineering principles were violated in the Therac-25 case. One such principle was that "software should be subject to extensive testing... at the module and software level", and that only performing system testing is not sufficient (Levenson & Turner, p.39). I agree that extensive testing should be performed on all parts of a system and its programming. I would argue that there is a justifiable reason to sell a less reliable life-threatening system that could potentially help more people. If, for example,

patients were going to die very soon without treatment, I could understand selling or using a less reliable and potentially deadly machine. However, it should be made clear to all involved parties that the machine is not completely reliable and that it is up to the patient(s) to decide if they wish to use the machine. Many would likely disagree with my reasoning, as this would violate both the AMC and IEEE Code of Ethics. Both Codes state that professionals have a responsibility to preserve the wellbeing of society and individuals, and promoting an unreliable machine or program would violate those principles. Personally, I would only use the Therac-25 or something similar if it were my only chance at survival. Since most U.S. states require a certification process for non-software engineers, it would make sense to extend that requirement to software engineers. Requiring a certification would, at minimum, help make software engineers more aware of the consequences of subpar coding or testing strategies, and could help standardize testing and coding practices throughout the industry.

Personally, I believe that computer professionals have a moral obligation to ensure that their work is as safe as possible to the best of their knowledge. This includes conducting rigorous testing, especially if the program or device a professional is working on has the potential to drastically alter an individual's life in a negative way. The first tenet (I.1) of the IEEE Code of Ethics states that professionals should strive to "hold paramount the safety, health, and welfare of the public" (IEEE Code of Ethics). As a Christian, the Bible states that we should "build a parapet around our roof" when we build a new house so that "the guilt of bloodshed" will not be brought upon your house if someone were to fall (*NIV Bible*, Deut. 22.8). This lesson is applicable to our daily lives, specifically to things we create. We should ensure that we prioritize safety when creating or building so that we do not bring harm to others.

Works Cited

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