

CS111 Final Exam

Ethics Material Practice Questions

1. The Therac-25 radiation therapy machine was a real medical machine that had a race condition which caused the machine to malfunction in certain scenarios. Here are some key details about it:
 - Due to a race condition, it exposed some patients to radiation overdoses
 - One of the bugs was in older Therac-20 code, and that code was copied into Therac-25, but Therac-25 replaced Therac-20 hardware safety features (which meant that the issue had never been detected there) with software to reduce costs.
 - The company didn't have independent testers evaluate the software

Define agential gullibility and, using the information above, identify/describe one way the company developing Therac-25 exhibited agential gullibility in the development of its software.

2. In filesystems, filesystem permissions prevent unauthorized users from accessing files. Explain in 2-4 sentences the concept of trust by substitution, and how filesystem permissions are an example of trust by substitution.

Some possible could include:

1. intellectual property vs. security: the company preserves its intellectual property by not letting others view its source code. However, this comes at the cost of others being able to independently verify the code is free of security issues or other issues.
2. Agential gullibility is trusting more than is warranted. One example here is they reused software from the previous Therac-20 machine, trusting it was defect-free. Another example is they trusted the software worked without independent review.
3. Trust by substitution is a technical or sociotechnical design that substitutes the need to trust a system or component of a system to a certain extent. In filesystems, user permissions limiting what privileges certain users have substitutes the need to fully trust every user of a system to only access permitted files.