Assignment 3

COMP 4290
Due: October 10, 2025 before 11:59 p.m.
Upload your Word, PDF, or zipped LaTeX file to Brightspace

Exercises from the Textbook (60 points):

Section 3.5: 14, 16, 22, 23

Section 4.7: 3, 7, 8, 10, 14, 16, 17, 21

Additional Exercises (40 points):

1. Although many biological viruses can be fatal, a virus that kills its victims too quickly may limit its ability to spread to new hosts. Is there a parallel principle that shapes how computer viruses function? Do you think that this idea has affected the way that computer viruses have evolved in the last 20 years?

2. Financially, Apple has been very successful in the last decades. Apple maintains tight control over their hardware and software, ensuring a consistent user experience. However, the secrecy needed to maintain this control violates the secure design principle of Open Design. Do you think that Apple's choice to ignore Open Design was a good one or a bad one? It's recommended that you mention media controversies around Apple security in your argument.

3. One reason that web browsers pose such a difficult security problem is that they are used for so many different purposes. Originally, browsers were designed to read static HTML files. Now, browsers provide e-mail through web interfaces, video entertainment through streaming services, executable file download capabilities, video conferencing, PDF display, banking, shopping through countless websites, and many other examples of functionality. From a security perspective, do you think it's better to continue the current trend of using web browsers as a central portal to everything on the Internet or would it be better to use specialized programs for each activity? Be sure to support your argument with discussion of secure design principles, whether current attacks would increase or decrease in an alternate model, and the role of good software engineering.

4. In its discussion of spam, the book points out that it is, at present, very difficult to stop spam, both from a legal and a technological perspective. Precisely define what you think counts as spam and what doesn't count as spam. Then, propose the best legal and technological means you can think of to stop people from sending what you have defined as spam.