Homework 4

Due: November 22, 2022
Points: 100

1. (30 points) Discuss controls that would prevent Dennis Ritchie’s bacterium (see Section 23.6.1) from absorbing all system resources and causing a system crash.

2. (30 points) Consider the statement

   \[ \text{if } (x = 1 \text{ and } y = 1) \text{ then } z := 1 \]

   where \( x \) and \( y \) can each be 0 or 1, with both equally likely and \( z \) is initially 0. Compute the conditional entropies \( H(x|z') \) and \( H(y|z') \).

3. (40 points) Extend the semantics of the information flow security mechanism in Section 17.3.1 to include structures (sometimes called “records”).