Homework 1

Due Date: **Wednesday, 9/24, 11:59pm**

Instructions

1. Unless otherwise specified, any assignment involving programming may be completed with the programming language of your choice. If asked, you should be able to explain the details of your source code (e.g. program design and implementation decisions).
2. You are bound by the Stevens Honor System. All external sources must be properly cited, including the use of LLM-based tools (e.g. ChatGPT). Your submission acknowledges that you have abided by this policy.
3. Solutions are accepted only via Canvas, where all relevant files should be submitted as a **single `.zip` archive that expands into a directory**. This directory should include your ***typed*** **answers as a `.pdf` file** and **source code of any programming used in your solutions** with the following structure:

   ```
   <lastname>_<firstname>.hw<#>/
   ├── solutions.pdf
   └── src/
       └── <source code files>
   ```

   Your `src` folder should document all necessary steps for reproduction. If we are unable to reproduce your results, you may lose credit.

   There is a python validation script you should use to confirm it is correct.

Problem 1 - (*30 pts*) Equifax Case Study

Complete Questions **2.1**, **2.2**, and **2.5** from the Vallor Cybersecurity Ethics reading posted on Canvas. Each question is worth 10 points and is graded on quality of argument.

Problem 2 - (*40 pts*) Bell-LaPadula Answering Script

Complete Level 19 of the *Access Control* module on `pwn.college`.

Describe the design of your code here, from how inputs were obtained, to how they were processed, and how you constructed the output. If your process was iterative, describe the design changes you made at each step.

Submit the source code of your final program as a separate file or folder of files named `lvl19`, with the appropriate file extension as needed.

Problem 3 - (*30 pts*) Copying Rights

Suppose Alice has *r* and *w* rights over the file *book*. Alice wants to copy the *r* right over *book* to Bob.

1. Assume the copy right *c* exists in the system . Write a protection state transition command that a subject *p* can use to copy the *r* right over an object *f* to another subject *q* if *p* is allowed to do so.
2. Now assume the system does not implement the copy right, but a copy flag; for example, the right *r* would be written as *r(c)* if the copy flag is set for it. Write a command that a subject *p* can use to copy the *r(c)* right over an object *f* to another subject *q* if *p* is allowed to do so.
3. With the same assumption, write a command that would only grant the *r* right without the copy flag. If Alice had *r(c)w* rights and used this command for *book* with Bob, what would Bob be able to do with *book*?