

Instructional Scenario

The Automation Intern



Course/Duty Area: Cybersecurity Fundamentals/Programming as a Component of Cybersecurity

Estimated Time Required: 6–8 hours

Scenario:

You have just started an internship at SecureStream, a company that manages data for local hospitals. Your mentor explains that programming is central to the entire computing infrastructure. Because SecureStream handles sensitive medical records, your mentor emphasizes the importance of secure coding to prevent vulnerabilities.

You will be reviewing various security mechanisms that are themselves software programs, such as firewalls and antivirus tools in a Linux environment. This will require knowledge of the command line interface (CLI) and basic Linux commands to navigate the servers where the data is stored. Your primary task is to make the security team more efficient by writing a Python script to analyze log files for suspicious login attempts.

Big Question:

How can a cybersecurity professional use programming, scripting, and Linux tools to automate security tasks and ensure that software is both functional and secure?

Focused Questions:

- How does a script (like Python) differ from a compiled program (like C++), and why might you choose one over the other for a quick security task?
- In the context of SecureStream's medical data, why is secure coding just as important as the actual function of the program?
- What are some examples of software programs that act as security mechanisms to protect a network?
- If you are using the Linux CLI, which commands would you use to move into a directory and list the files to find a specific log?
- How can you use Python functions to take a long, messy log file and turn it into useful information?
- How do markup languages like JSON or XML help when calling an API to share data between different systems?

Student Project or Outcome:

Students will develop a basic script (using pseudocode or Python) that analyzes a sample Linux log file.

Project-Based Assessment:

- Create a presentation with the script that will analyze a log file. The presentation must include an explanation or demonstration of the Linux commands used to run the script and a brief explanation of the secure coding principles they followed.
- The focused questions must also be addressed in the presentation.

Teacher Resources:

- [Virginia Cyber Range](#)
- [Intro to Python with Tracy the Turtle](#), Code HS

- Gemini (or other AI platform) to create the Python script and sample log file.

Scenario submitted by Stephanie Holt, Fairfax County Public Schools

ChatGPT artificial intelligence was used in the development of this instructional scenario.