



Florida International University

Fall 2024 Senior Design Project

Panther Prowl

Student: Alejandro Terzini

Instructor/Faculty: *Masoud Sadjadi*, Florida International University

PROBLEM

Students preparing for certifications like CompTIA A+ and Security+ often lack engaging resources that combine theoretical knowledge with practical skills. Traditional study methods can feel static, and accessible tools for hands-on learning, such as CTF challenges, are limited, making it harder to build critical problem-solving abilities.



REQUIREMENTS

The system requires a Windows operating system with virtualization enabled. For software, a hypervisor capable of running virtual machines is needed, along with a Linux-based command-line interface (CLI) to interact with the program's scenarios and challenges.

OBJECT DESIGN

The program's design focuses on creating a diverse range of challenges to build practical skills. Linux command-line challenges are integrated to enhance proficiency with essential tools and commands. Programming modules are included to test and develop scripting abilities in realistic scenarios. Network security tasks are designed to simulate vulnerabilities and require students to analyze and secure systems, fostering a comprehensive understanding of cybersecurity principles.

SYSTEM DESIGN

The program is built around a pre-configured virtual machine (VM) designed to replicate real-world cybersecurity scenarios. This VM provides students with interactive CTF challenges and practical tasks, enabling hands-on experience with command-line interfaces, essential tools, and custom scripts. By integrating quizzes and exams with these simulated environments, the system bridges theoretical learning with applied problem-solving skills.

IMPLEMENTATION

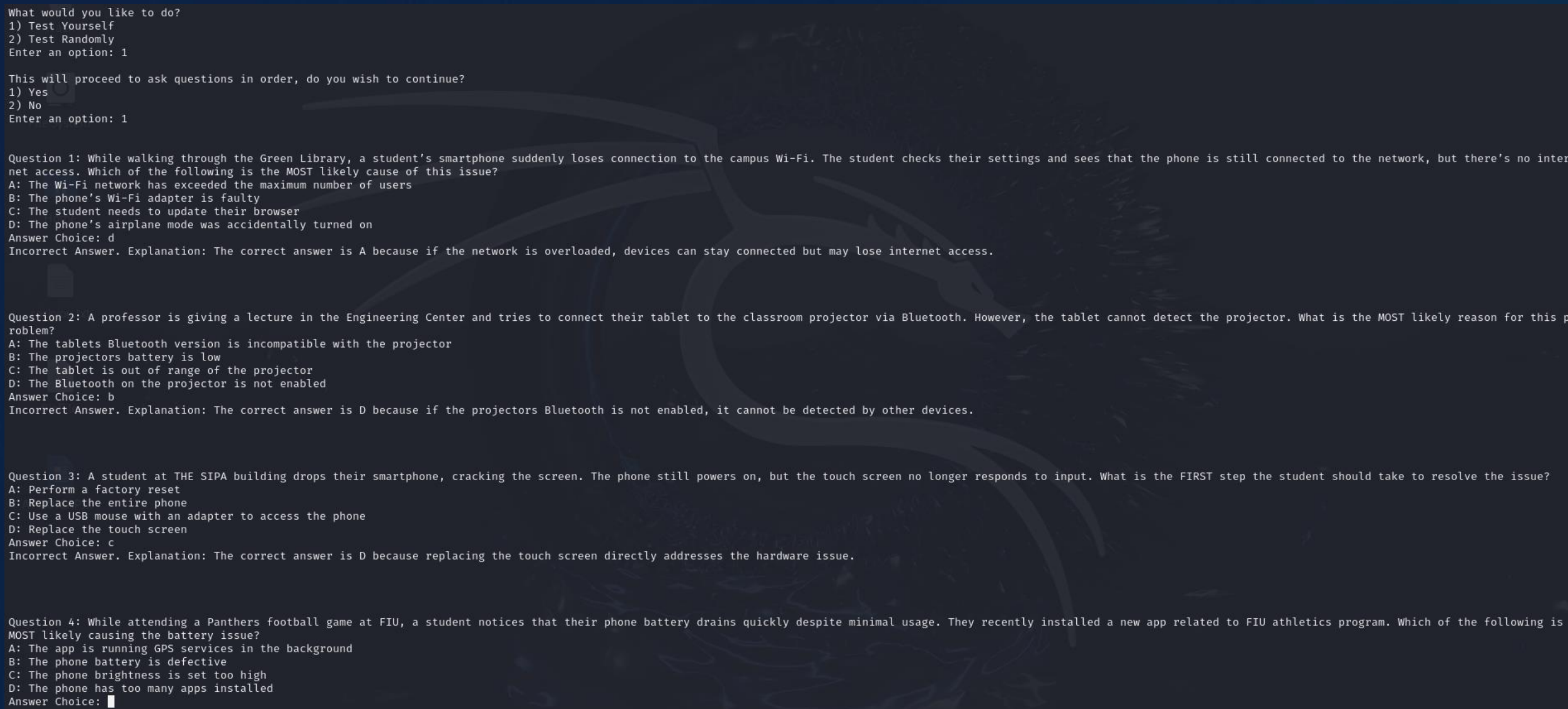
Integrated certification-aligned exam questions for CompTIA A+ and Security+ into the program, ensuring proper formatting and functionality. Designed and implemented intermediate-level CTF challenges by scripting realistic cybersecurity scenarios. Configured tasks to utilize Linux command-line tools and scripts within a virtualized environment, providing an engaging and practical learning experience for students.

CONTRIBUTION

Inputted certification-aligned exam questions for CompTIA A+ and Security+.

Developed intermediate-level CTF challenges simulating real-world cybersecurity scenarios.

Designed tasks to engage students with command-line interfaces, tools, and scripts in a practical learning environment.



SUMMARY

Panther Prowl is an interactive program designed to prepare students for CompTIA A+ and Security+ certifications through a combination of knowledge quizzes, exams, and hands-on CTF challenges. By leveraging a pre-configured virtual machine, the program replicates real-world cybersecurity scenarios, enabling students to interact with command-line interfaces, tools, and scripts.

ACKNOWLEDGEMENT



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