

TECHX 3.0 ASSIGNMENT

CYBERSECURITY ASSIGNMENT

ASSIGNMENT OVERVIEW:

This assignment aims to introduce you to the foundational concepts of cybersecurity, including common threats and effective mitigation strategies. You will work on real-world problem statements, involving network security, cryptography, and malware analysis. The tasks will enhance your understanding of cybersecurity principles and solutions.

DESCRIPTION

The assignment is divided into three main tasks:

Task 1: Network Security Threat Identification

In this task, you will identify and analyze common network security threats based on a real-world scenario provided. You need to:

1. Study a sample network environment.
2. Identify at least three potential security vulnerabilities (e.g., DDoS attacks, Man-in-the-Middle attacks).
3. Propose solutions to mitigate these vulnerabilities using tools like firewalls, VPNs, and intrusion detection systems (IDS).

Task 2: Cryptography Application

In this task, you will focus on secure communication using cryptography. Based on a problem statements you need to:

1. Encrypt and decrypt a message using both symmetric (AES) and asymmetric (RSA) encryption techniques.
2. Compare the performance and security of each method in different use cases.
3. Demonstrate how public and private key pairs are generated and used for secure data transmission.

Task 3: Malware Detection and Analysis

This task will introduce you to basic malware detection and analysis, referencing a challenge:

1. Download a malware sample (from [kaggle.com](https://www.kaggle.com))
2. Use static and dynamic analysis techniques to identify its behavior.
3. Propose countermeasures to prevent such malware from affecting a computer system.