CS-3610: Information Security (Spring 2025)

Assignment Type: Individual

Assignment - 3   **Marks: 100**
Assign Date: Feb 25, 2025   *Submit Date: 23:55, March 12, 2025*

Objective

The goal of this assignment is to apply the principles of threat modeling to the Unified Payments Interface (UPI) system. Analyze potential threats, adversaries, and attack vectors within the system and propose mitigations. To gain a broader perspective, read: *Security Without Identification: Transaction Systems to Make Big Brother Obsolete* by David Chaum.

Problem Statement

Perform a threat modeling analysis of UPI by addressing the following aspects:

1. **System Overview:** Provide a concise description of how UPI works, including key components, actors, and transactions.

2. **Threat Actors and Adversaries:** Identify potential threat actors who may target UPI.

3. **Capabilities of Adversaries:** Analyze what resources, techniques, and attack vectors these adversaries may leverage against UPI.

4. **Trust vs Verifiability:** Clearly define the trust assumptions in UPI and identify trust points that could be exploited. Discuss mechanisms to enhance verifiability in transactions.

5. **Threat Analysis:** Identify and categorize potential threats using a framework such as STRIDE (Spoofing, Tampering, Repudiation, Information Disclosure, Denial of Service, Elevation of Privilege).

6. **Mitigations and Countermeasures:** Propose security measures to mitigate the identified threats. Discuss feasibility and potential trade-offs.