

# InnovateX: University Edition Competition

## Terminologies (Retail Environment)

1. **Retail:** A business sector involving the sale of goods or services directly to consumers (end-users) through various channels such as physical stores, online platforms, or direct selling. Examples include supermarkets, department stores, specialty shops, and e-commerce websites.
2. **Scan Avoidance:** A form of retail theft where perpetrators deliberately prevent items from being scanned at checkout by concealing barcodes, covering products, or using sleight of hand to avoid scanning items while appearing to do so, resulting in unpaid merchandise leaving the store.
3. **Barcode Switching:** A fraudulent practice where perpetrators replace or cover legitimate barcodes on higher-priced items with barcodes from lower-priced items, causing the checkout system to charge less than the item's actual price.
4. **Inventory Session:** A scheduled period during which inventory data is systematically collected using technology like RFID readers. In RFID systems, this involves activating antennas in sequence to scan product tags, processing the collected data, and updating inventory records.
5. **Good Scan:** A retail transaction event where an item is properly scanned, correctly identified, and accurately priced without any fraudulent activity or technical errors, resulting in proper inventory tracking and billing.
6. **Self-Checkout:** A point-of-sale (POS) system that allows customers to scan, bag, and pay for their purchases independently without cashier assistance. These systems typically include a scanning area, bagging platform, payment interface, and security measures to prevent theft.
7. **RFID Tag:** A small electronic device consisting of a microchip and antenna that can be attached to products. They come in two main types:
  - **Passive tags:** Operate without a power source, using energy from the RFID reader's radio waves to transmit stored information
  - **Active tags:** Contain their own power source (battery), allowing them to broadcast signals over greater distances
8. **RFID Reader:** An electronic device that emits radio waves to communicate with RFID tags. It can send signals to activate tags, receive and interpret data transmitted by tags, and communicate this information to inventory management systems. Readers vary in size, range, and functionality depending on application needs.



9. **RFID Technology:** Radio Frequency Identification technology that uses electromagnetic fields to automatically identify and track tags attached to objects. RFID systems enable contactless reading of multiple tags simultaneously without line-of-sight requirements, making them efficient for inventory management, asset tracking, access control, and supply chain operations.
10. **Queue Monitoring and Management:** The systematic process of analyzing customer wait lines and optimizing service efficiency. This includes:
- Tracking queue lengths and wait times
  - Dynamically allocating staff based on current demand
  - Opening or closing service points (cashier stations or self-checkouts)
  - Implementing predictive staffing based on historical patterns
  - Balancing customer wait-times with operational efficiency and labor costs