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**BSCS 3B CSST - 102**

**Presentation on Machine Learning Applications**

**1. Healthcare: Predicting Disease Outbreaks**

**Problem Being Solved:** Predicting outbreaks of diseases like flu or COVID-19 to enable timely intervention and resource allocation.

**Type of Machine Learning Used:**

* **Supervised Learning**: Algorithms like decision trees and neural networks are trained on historical health data to predict future outbreaks.

**Impact of the Solution:**

* **Early Warning**: Provides early warnings to health authorities, allowing for faster response and prevention measures.
* **Resource Optimization**: Helps in the efficient allocation of medical resources and personnel.
* **Improved Public Health**: Reduces the spread of diseases and potentially saves lives by enabling proactive measures.

**2. Finance: Fraud Detection**

**Problem Being Solved:** Identifying and preventing fraudulent transactions in real-time to protect consumers and financial institutions.

**Type of Machine Learning Used:**

* **Unsupervised Learning**: Techniques like clustering and anomaly detection are used to identify unusual patterns and behaviors that may indicate fraud.

**Impact of the Solution:**

* **Enhanced Security**: Reduces financial losses by detecting fraudulent activities early.
* **Customer Trust**: Increases trust in financial institutions by safeguarding transactions.
* **Operational Efficiency**: Automates fraud detection processes, reducing the need for manual intervention.

**3. Marketing: Customer Segmentation**

**Problem Being Solved:** Dividing customers into distinct groups based on behavior and preferences to tailor marketing strategies effectively.

**Type of Machine Learning Used:**

* **Unsupervised Learning**: Clustering algorithms like K-means are used to identify different customer segments based on their purchase history and interactions.

**Impact of the Solution:**

* **Targeted Marketing**: Allows companies to create personalized marketing campaigns, improving engagement and conversion rates.
* **Increased Sales**: Optimizes marketing efforts, leading to higher sales and customer retention.
* **Cost Efficiency**: Helps in allocating marketing resources more effectively, reducing wasted spend on broad, untargeted campaigns.