FML UNIT 1

➢ Introduction to AI

- Applications of AI

➢ Introduction to ML

- Define ML
- Differentiate between ML and AI
- Applications of ML
- Real-world example of ML

➢ Types of ML

- **Supervised Learning**
  - What is supervised learning?
  - Provide two examples of a real-world problem that is best solved using supervised learning, and explain why?
  - **Supervised learning algorithms:**
    - Linear Regression
    - Logistic Regression
    - Decision Trees
    - Random Forest
    - Support Vector Machines (SVM)
    - k-Nearest Neighbours (k-NN)

        - Gradient Boosting
        - Baye's Algorithm

    - Steps to train a supervised machine

- **Unsupervised Learning**
    - What is unsupervised learning?

    - Provide two examples of a real-world problem that is best solved using unsupervised learning, and explain why?

    - **Unsupervised learning algorithms:**
        - Clustering:
            - ✓ K-Mean clustering
            - ✓ Hierarchical clustering
            - ✓ Density based clustering
            - ✓ Mean Shift clustering
            - ✓ Spectral clustering
        - Dimensionality Reduction:
            - ✓ PCA
            - ✓ LDA
            - ✓ NMF
            - ✓ LLE
            - ✓ ISOMAP
        - Anomaly Detection/Association Rule algorithm:
            - ✓ A-priori algorithm

- ✓ FP Growth algorithm
- ✓ ECLAT algorithm

- Steps to train an unsupervised machine

- **Reinforcement Learning**
  - What is reinforcement learning?
  - Provide two examples of a real-world problem that is best solved using reinforcement learning, and explain why?
  - **Reinforcement learning algorithms:**
    - Based on learning:
      - ✓ Positive Reinforcement Learning
      - ✓ Negative Reinforcement Learning
    - Based on Environment model:
      - ✓ Model-Free Reinforcement Learning
        - ❖ Value-Based Reinforcement Learning
        - ❖ Policy-Based Reinforcement Learning
        - ❖ Actor-Critic Methods (Hybrid Approach)
      - ✓ Model-Based Reinforcement Learning
  - Steps to train a reinforcement machine