Additional Machine Learning Topics

Pre-Preprocessing & Feature Engineering	Supervised Learning	Unsupervised Learning	Model Evaluation	Model Tuning
• Encoding and Binning - Label Encoding - One Hot Encoding - Ordinal Encoding - Binary Encoding - Frequency Encoding • Scaling and Transformation - Standard Scalar - MinMax Scalar - Robust Scalar - MaxAbs Scalar - Log Transformation - Power Transformation • Text Processing - Regex - Stemming/Lemmatization - Tokenization - POS Tagging - Stopwords Removal - Vectorization - Count - Tf-Idf - Word2Vec - BERT Embeddings • Dim Reduction - PCA - Filter Methods - Embedded Methods - Wrapper Methods • Feature Creation - Mathematical Combinations - Integration Features - Aggregations • Imbalanced Dataset - Under Sampling - Over Sampling - SMOT Tomek • Python Libraries - Pandas - NumPy - NLTK/SpaCy for Text - Imblearn - Statsmodels - Scikit-learn	• Regression - Linear Regression - Polynomial - Lasso/Ridge - Elastic Net - SVR - KNN Regressor - Booting Regressor - Random Forest Regressor • Classification - Tree Based Models - Decision Tree - Random Forest - Extra Trees - Gradient Boosting Machine (GBM) - XGBoost - AdaBoost - LightGBM - CatBoost - KNN Classifier - Logistic Regression - SVC - Naive Bays - Ensemble Techniques	• Clustering • PCA	• Bias Variance Tradeoff • Cross Validation - K-Fold - Stratified k-Fold - LOOCV - Time Series Split • Confusion Matrix for Classification - Accuracy - Precision - Recall - F1 Score - AUC/ROC • Model Evaluation for Regression - R-Squared (Accuracy) - MSE - MAE - RMSE	• Grid Search • Random Search • Genetic Algorithm • Bayesian Optimization

Additional Deep Learning Topics

DL Basics	Image/Video (CV)	Text (NLP)	Library/Framework
• ANN Architecture • Neural Networks Architecture • Neural, Input-Output, Hidden Layers • Activation Functions (ReLU, Sigmoid, SoftMax, Swish, Tanh & Linear) • Loss Functions (Cross-Entropy, MSE/MAE) • Optimizers (SGD, Adam, RMSprop) • Forward and Backward Propagation • Epochs, Batch Size, Learning Rate • Overfitting and Regularization (Dropout, L2) • Vanishing and Exploring Gradient	• Image Processing - Normalization - Augmentation - Color Conversion • Image Classification using CNN - Raw Pixels - CNNs (Backbone) - Pretrained CNNs - VGG - ResNet - ImageNet - Others	• Text Processing (Details in ML) • Sequence Models - RNNs - LSTMs - GRUs - BERT • Core Text Tasks in NLP - Text Classification - Sentiment Analysis	• Keras • TensorFlow