

Statistical Learning Methods Cheat Sheet

1. Supervised Learning (Prediction and Classification)

- Linear Models: Linear Regression, Logistic Regression
- Regularized Linear Models: Ridge Regression, Lasso Regression, Elastic Net
- Tree-Based Models: Decision Trees, Random Forest, Gradient Boosting Machines (e.g., XGBoost)
- Support Vector Machines (SVM): Classification and regression
- Neural Networks: Feedforward, Convolutional (CNNs), Recurrent (RNNs)
- Generalized Additive Models (GAMs): Non-linear regression with interpretability

2. Unsupervised Learning (Clustering and Dimensionality Reduction)

- Clustering: K-Means, Hierarchical Clustering, DBSCAN
- Dimensionality Reduction: PCA, t-SNE, UMAP

3. Semi-Supervised Learning

- Self-Training: Labels unlabeled data iteratively
- Label Propagation: Propagates label information across similar data points

4. Reinforcement Learning

- Q-Learning: Action optimization
- Deep Reinforcement Learning: Combines neural networks and reinforcement learning

5. Non-Parametric Methods

Statistical Learning Methods Cheat Sheet

- Kernel Density Estimation
- K-Nearest Neighbors (KNN)
- Gaussian Processes

6. Probabilistic Models

- Bayesian Regression
- Naïve Bayes
- Hidden Markov Models (HMMs)

7. Ensemble Learning

- Bagging: Random Forest
- Boosting: Gradient Boosting
- Stacking: Combines multiple models

8. Time Series Analysis

- ARIMA
- Exponential Smoothing (ETS)
- Recurrent Neural Networks (RNNs): LSTM, GRU

9. Causal Inference Models

- Propensity Score Matching (PSM)

Statistical Learning Methods Cheat Sheet

- Instrumental Variables (IV)
- Difference-in-Differences (DiD)
- Structural Equation Models (SEM)