Model Evaluation

ML Instruction Team, Fall 2022

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Why Evaluation?

- Estimation of the generalization error
- Increasing of the predictive performance
- Selecting best-suited ML algorithm for our problem

Why Validation?

- Training set error is an optimistically biased estimator of the generalization error
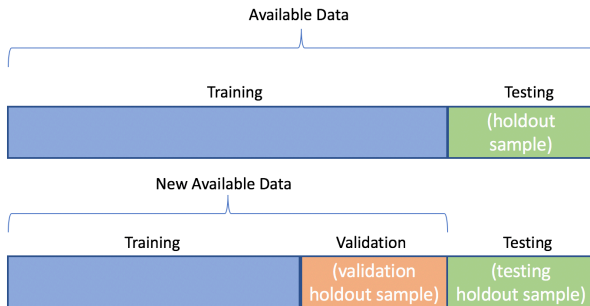- Test set error is an unbiased estimator of the generalization error

Validation
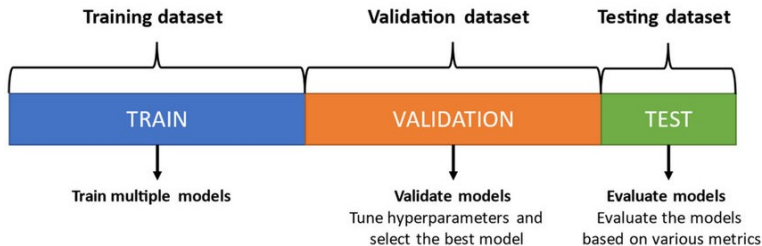
Types of Validation

- Holdout Validation
- LOOCV (Leave One Out Cross Validation)
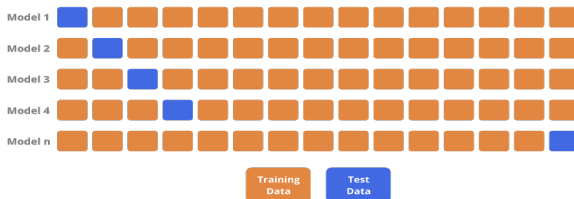- K-Fold Cross Validation

Holdout Validation

- Pros
  - ▶ Fully independent of data
  - ▶ Lower computational costs
- Cons
  - ▶ higher variance

LOOCV

Leave-One-Out Cross Validation

- Pros
  - ▶ Lower bias
- Cons
  - ▶ Higher computational cost

K-Fold Cross Validation

- Pros
  - ▶ Lower computational compared to LOOCV
  - ▶ Lower variance campared to Holdout
  - ▶ Reducing both Bias and Variance
- Cons
  - ▶ Higher computational costs in big data state
  - ▶ Impact model in imbalanced data state

Thank You!

Any Question?