# Simple Imputer

# Iterative Imputer

# KNN Imputer

# **Meyer Notes**

* Simple
  + Takes median of feature
* Iterative
  + Explained really well here “A more sophisticated approach is to use the [IterativeImputer](https://scikit-learn.org/stable/modules/generated/sklearn.impute.IterativeImputer.html#sklearn.impute.IterativeImputer) class, which models each feature with missing values as a function of other features, and uses that estimate for imputation. It does so in an iterated round-robin fashion: at each step, a feature column is designated as output y and the other feature columns are treated as inputs X. A regressor is fit on (X, y) for known y. Then, the regressor is used to predict the missing values of y. This is done for each feature in an iterative fashion, and then is repeated for max\_iter imputation rounds. The results of the final imputation round are returned.”
* KNN
  + Explained really well here “The [KNNImputer](https://scikit-learn.org/stable/modules/generated/sklearn.impute.KNNImputer.html#sklearn.impute.KNNImputer) class provides imputation for filling in missing values using the k-Nearest Neighbors approach. By default, a euclidean distance metric that supports missing values, [nan\_euclidean\_distances](https://scikit-learn.org/stable/modules/generated/sklearn.metrics.pairwise.nan_euclidean_distances.html#sklearn.metrics.pairwise.nan_euclidean_distances), is used to find the nearest neighbors. Each missing feature is imputed using values from n\_neighbors nearest neighbors that have a value for the feature. The feature of the neighbors are averaged uniformly or weighted by distance to each neighbor. If a sample has more than one feature missing, then the neighbors for that sample can be different depending on the particular feature being imputed. When the number of available neighbors is less than n\_neighbors and there are no defined distances to the training set, the training set average for that feature is used during imputation. If there is at least one neighbor with a defined distance, the weighted or unweighted average of the remaining neighbors will be used during imputation. If a feature is always missing in training, it is removed during transform. For more information on the methodology, see ref. [[OL2001]](https://scikit-learn.org/stable/modules/impute.html#ol2001).
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