**CHEAT SHEET**

# Gradient Boosted Decision Trees (GBDT)

| | |
|---|---|
| **Algorithm Name** | GBDT (an acronym for gradient boosted decision trees) |
| **Description** | GBDT is an iterative model that progressively refines its predictions by combining multiple decision trees. The first "tree" simply predicts the average of the output variable then each successive tree is trained on the residuals from the predictions at the previous level. |
| **Applicability** | Classification and regression problems |
| **Assumptions** | Independent and identically distributed data |
| **Underlying Mathematical Principles** | Adds trees to the ensemble, reduces the residual error in each iteration until there is none |
| **Hyperparameters** | Number of trees to add, depth of the trees, and learning rate |
| **Setting** | Note that while **regression** trees return continuous values, we can still use them to solve classification problems with discrete labels. For example, we can return the sign of the output of the tree. |
| **Loss Function** | For regression, squared loss; for classification, log loss |