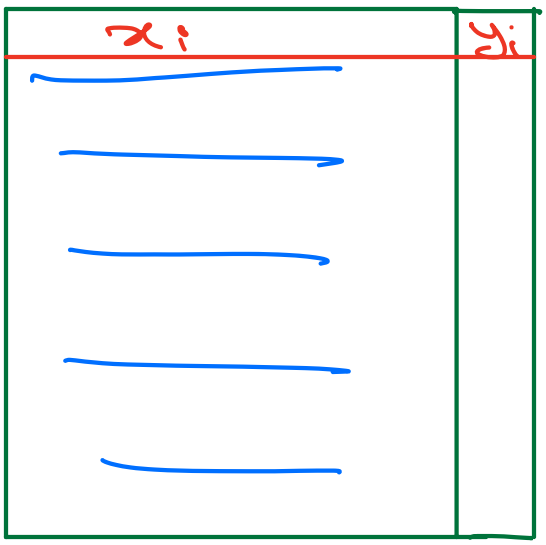
Boosting

Bagging ⇒ Base Model (Low Bias - High Variance) + Bootstrap Aggregation

Boosting ⇒ Base Model (Hight Bias - Low Variance) + Additive Combining

Core idea ⇒ Reduce the Bias of Model

* Regression problem



* Step 0 : Pick a simple Model and Calculate residuals

$\{x^i, y^i\} \longrightarrow M_0$

$(y) \rightarrow \frac{1}{n}\sum_{i=1}^{n}(y_i)$

$error_0 = y^i - h_0(x^i)$ (Predicted) Model M_0

$y_i = h_0(x^i) + Error_i$ ← minimum

100 - 80 $h_0 x_i$

Fit Next Model on This

① Step

$\{x^{(i)}, error_0^{(i)}\}_{i=1}^{n} \longrightarrow M_1$ (DT with Low Depth)

Pred

$h_1 x_i$

* High Bias Low Var

Do it (16).

Prediction = $h_0(x) + h_1(x)$

new $y = y - (h_0(x) + h_1(x))$

Continue this Till N time

Example

Height	Gender	Weight
1.6	M	82
1.9	F	55
1.4	F	66
1.4	M	65