

# Medium1

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**Problem** Write a vignette in LaTeX or MathJax explaining how to use the logistic loss with non-uniform weights to get the binomial loss function in xgboost.

**Answer -** Logistic loss is used when  $y = \{-1, 1\}$  and binomial loss or cross entropy or log loss function refers to cross entropy or log loss where  $y = \{0, 1\}$ . Logistic loss is as below:-

$$\text{logistic loss} = \frac{-\sum_{i=1}^n 2 * \ln(1 + e^{-y_i * \hat{y}_i})}{n} \quad (1)$$

where as

$$\text{binomial loss} = -\frac{y_i \log(\hat{y}_i) + (1 - y_i) \log(1 - \hat{y}_i)}{n} \quad (2)$$

We can adjust it by factor of 2 to get the logistic loss.