Psudocode example in LaTeX

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The AdaBoost algorithm for multi-class classification problem (SAMME):

Algorithm 1 SAMME

Input:

1. *dataset*: a set of n labeled examples $(x_1, y_1), \ldots, (x_n, y_n)$.
2. C: The base classification algorithm (classifier).
3. M: The number of hypotheses in the ensemble.
4. K: The number of categories.

Local variables:

1. w: A vector of n sample weights, initially $1/n$.
2. c: A vector of M classifiers.
3. z: A vector of K classifier weights.

function AdaBoost($dataset, C, M, K$)
  for $m \leftarrow 1, M$ **do**
    $c_m \leftarrow C(dataset, w)$ ▷ Fit a classifier

    $error \leftarrow 0$ ▷ Compute the error
    for $i \leftarrow 1, n$ **do**
      if $c_m(x_i) \neq y_i$ **then**
        $error \leftarrow error + w_i$
      end if
    end for

    $z_m \leftarrow \log\left(\frac{1-error}{error}\right) + \log(K-1)$ ▷ Compute the weight for this classifier

    for $i \leftarrow 1, n$ **do** ▷ Update the sample weights
      if $c_m(x_i) \neq y_i$ **then**
        $w_i \leftarrow w_i \cdot \frac{1-error}{error} \cdot (K-1)$
      end if
    end for

    $w \leftarrow$ NORMALIZE(w) ▷ Normalize the sample distribution
  end for
  return WEIGHTED_MAJORITY(c, z, x)
end function