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**Algorithm 1** Decision Tree Algorithm
 

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**Input:** Training Set  $D = \{(x_1, y_1), (x_2, y_2), \dots (x_d, y_d)\}$ ;

Attribute Set  $A = \{a_1, a_2, \dots a_d\}$ ;

**Output:** A decision tree root at node

**procedure** TREEGENERATE( $D, A$ )

  create node;

**if** all the samples in  $D$  belong to the same class  $C$  **then**

    label the Node as a leaf of class  $C$ ; **return**

**end if**

**if**  $A = \phi$  OR all the samples in  $D$  have the same value in  $A$  **then**

    label the Node as a leaf of the class to which most samples belong;

**end if**

  choose the optimal attribute  $a_*$ ;

**for** each  $a \in a_*$  **do**

    create a branch for the Node;

    let  $D_v$  represent the set in which all the samples have the value  $a$ ;

**if**  $D_v = \phi$  **then**

      label the branch node as a leaf of the class to which most samples belong; **return**

**else**

      take TreeGenrate( $D_v, A - a_*$ ) as branch node;

**end if**

**end for**

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