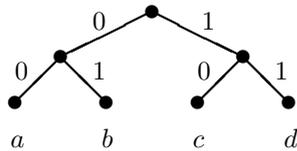


Instantaneous codes (tree codes)

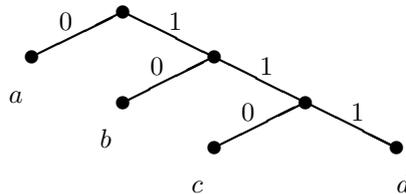
Lecture slide examples

An instantaneous code can always be described as a binary tree, ie the codewords are given by the paths from the root to the leaves in a binary tree. Code 1 and code 4 from the lecture slides are examples of instantaneous codes.

Code 1 is described by this binary tree:



Code 4 is described by this binary tree:



Decoding a tree code

When decoding an instantaneous code, we can use the tree description for decoding. Start at the root node of the tree. Read a bit from the bit sequence and go down the corresponding branch. Keep doing this until we reach a leaf node, then output the corresponding symbol to the symbol sequence and start over at the root node. Repeat until all the bits have been decoded.

For example, if we have coded a symbol sequence using code 4 above into the following bit sequence

1011000101110010

then using the above algorithm we can easily decode it into the symbol sequence

bcaabdaab