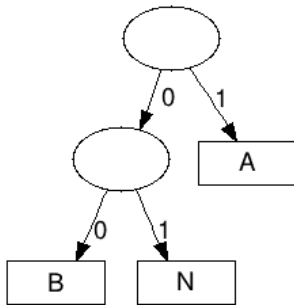


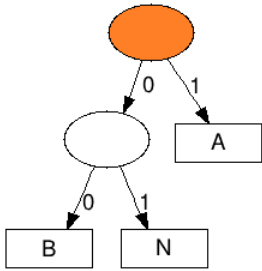
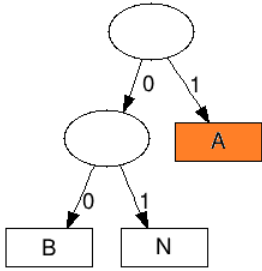
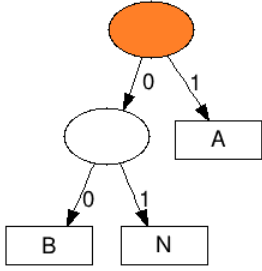
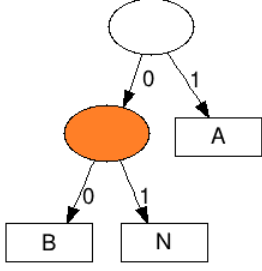
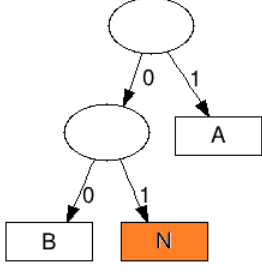
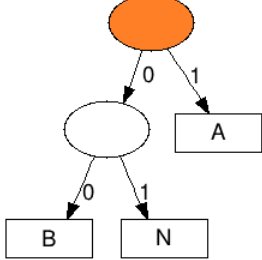
## Decoding Secret Messages with Encoding Trees

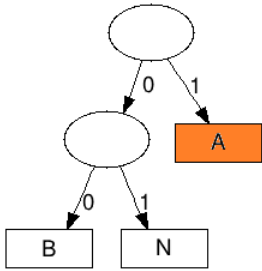
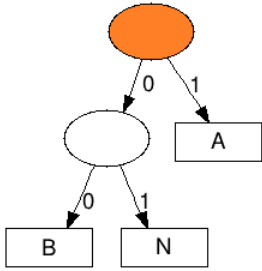
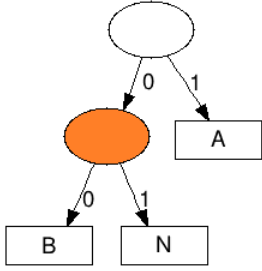
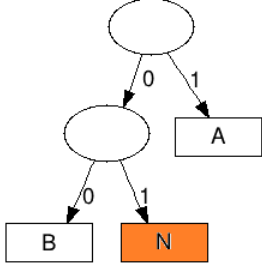
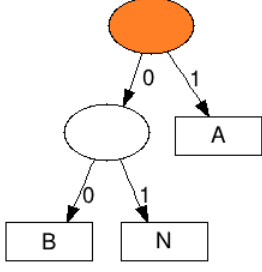
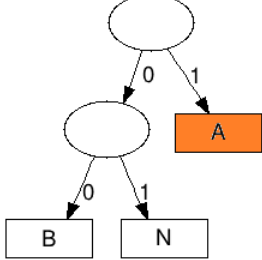
You will be using an encoding tree to reveal secret messages from your professors! Here's the idea: let's say you have a secret message that's "001011011" and a tree that looks like this:



If you use the code "001011011" as *instructions* for how to get from the root of the tree to a leaf of the tree, you can decode the message!

Current Instruction	Remaining Instructions	Tree Position	Notes
	001011011		We start at the root of the tree.
0	01011011		The instruction says "go to the 0 <sup>th</sup> child", so we move down the tree.
0	1011011		<p>The instruction says "go to the 0<sup>th</sup> child", so we move down the tree.</p> <p>We are now at a leaf which says the first decoded item is "B".</p> <p>Note that the "00" on this node picture does is just for visualization purposes, you do not store "00" in the node, only "B".</p>

	1011011		Since we decoded a letter, we'll reset back to the root again for the next instruction.
1	011011		<p>This time the instruction says “go to the 1<sup>st</sup> child”.</p> <p>We are now at a leaf, so we have the next letter (“A”).</p> <p>We’ve decoded “BA” so far!</p>
	011011		Reset for the next instruction.
0	11011		The instruction says “go to the 0 <sup>th</sup> child”.
1	1011		<p>The instruction says “go to the 1<sup>st</sup> child”.</p> <p>We are now at a leaf, so we have the next letter (“N”).</p> <p>We’ve decoded “BAN” so far...</p>
	1011		Reset for the next instruction.

1	011		<p>The instruction says “go to the 1<sup>st</sup> child”.</p> <p>We are now at a leaf, so we have the next letter (“A”).</p> <p>We’ve decoded “BANA” so far...</p>
			<p>Reset for the next instruction.</p>
0	11		<p>The instruction says “go to the 0<sup>th</sup> child”.</p>
1	1		<p>The instruction says “go to the 1<sup>st</sup> child”.</p> <p>We are now at a leaf, so we have the next letter (“N”).</p> <p>We’ve decoded “BANAN” so far...</p>
	1		<p>Reset for the next instruction.</p>
1			<p>The instruction says “go to the 1<sup>st</sup> child”.</p> <p>We are now at a leaf, so we have the next letter (“N”).</p> <p>We’ve decoded “BANANA” and we’re out of instruction! We have the secret message!</p>