*ASSUMPTIONS PAGE*

**BINARY TREE LOGIC**

Binary Trees are a type of graph that separates each node into two branches that each contain subtrees. In these types of graphs, each node has at most two children (left and right). Binary search trees are a type of binary tree in which the value of the left child is less than the parents and the value of the right child is greater than the parents. These trees can be complete, full, both, or neither. This program will make use of binary search trees to encode/decode Morse code.

**PROGRAM LOGIC**

The program will use two different trees to create the binary search tree: a typical binary tree, and the binary search tree node which will actually create the binary search tree to help decoded the Morse code. The tree will place a single dot on the left side and a single dash on the right side. The program will print the tree as given on its side. It will display when the user has entered the string to be encoded/decoded. The user will manually change the string in the main program. They will then uncomment the section the code that they are looking to use to have the encoding/decoding displayed to the screen. The tree will be created using classes, but there are 2 functions in the main for encoding/decoding.

**PROGRAM ASSUMPTIONS**

This program will assume that the user will input characters that are delimited by spaces (i.e. the user will insert “T E S T”).Due to this, the program will only accept strings as a parameter, not characters. MAY DECIDE TO ENCODE ENTIRE SENTENCES INSTEAD OF TRANSLATING ENTIRE WORDS

They will insert their single word as a string and separate the characters by a space. The user does not need to worry about case since the program will account for case.

Though the program will simply display an error message and end if the user accidentally inputs a digit, we can assume that the user is aware there is no Morse code value saved for numbers.

The program will assume that the user will input the string needing to be decoded with spaces as the delimiter (i.e. The user will insert “.\_(\*space\*)..\_” for decoding). This will ensure there is no confusion between characters that are similar.

The program will assume that the user will be using a period (.) to represent the dots in the Morse code instead of the bullet point (·). An error will be thrown if an unrecognized character is given and the program will terminate.

The program will assume the user will only be attempting to decode only one single word UNLESS A DOUBLE SPACE IS INSERTED. A DOUBLE SPACE MUST BE INSERTED BETWEEN WORDS TO DECODE MULTIPLE WORDS.

*ALGORITHM EFFICIENCY*

**BST NODE**

**BST**

**MAIN**

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**GITHUB URL**

<https://github.com/n-edmond/Morse_Code>