Description

Problem 3.21(b) asks for a program to check for balancing symbols.

In my implementation, the isBalanced is a method in the main file, which is tested in the main method with several different strings. The method takes the string as a parameter.
For each character, the function checks if it's an opening symbol. If it is, it pushes the character onto the stack.

If the character is a closing symbol, the function checks if the top of the stack matches the corresponding opening symbol. If it does, it pops the opening symbol from the stack. If it doesn't match, the function returns false.

Finally, the function checks if the stack is empty after iterating over all the characters in the input string. If it is, the function returns true. Otherwise, it returns false.

Complexity Analysis

The time complexity of the isBalanced function is O(n) where n is the length of the input string, since the function performs a constant number of operations (push, pop, and isEmpty) for each character in the input string. Therefore, the function has a linear time complexity.