

The reason why implementation is broken

I think the `isStringInLanguage` is broken for the following reasons:

1. Not implementing queue properly:
 - (a) Right now, the function works like a stack (it puts the last thing in first out) because it uses `pop()`. This is like doing a DFS. For NFAs, this way can be not so good, especially when there are many ε -transitions or loops, because it looks deeply into one path before going back to try another.
 - (b) If we change to using a queue (where the first thing in is the first out) by using `pop(0)`, the function will work more like a BFS. This is usually better for NFAs because it checks all the possible moves at every step. This way, it's less likely to miss the right paths.
2. Not using visited set:
 - (a) Right now, the function doesn't use the list that's supposed to keep track of where it's been. Not using this list can cause problems, like going in loops forever or checking the same places over and over.
 - (b) To stop going over the same states again and again and to avoid endless loops, the function needs to remember which states it has visited at each point in the input. This can be done with a set or a dictionary that keeps track of both the state and where we are in the input.

Example of language that lead method to misbehave

I think the broken implementation is especially a problem in complex NFAs where there are loops or lots of ε -transitions. A specific example can be the one that is given in the `main.py`:

$$((ab|cd)^*|(de^*fg|h(ij)^*klm^*n|q))^*$$

. It caused my compiler to run into infinite loops when I used it to test the functions on my computer.