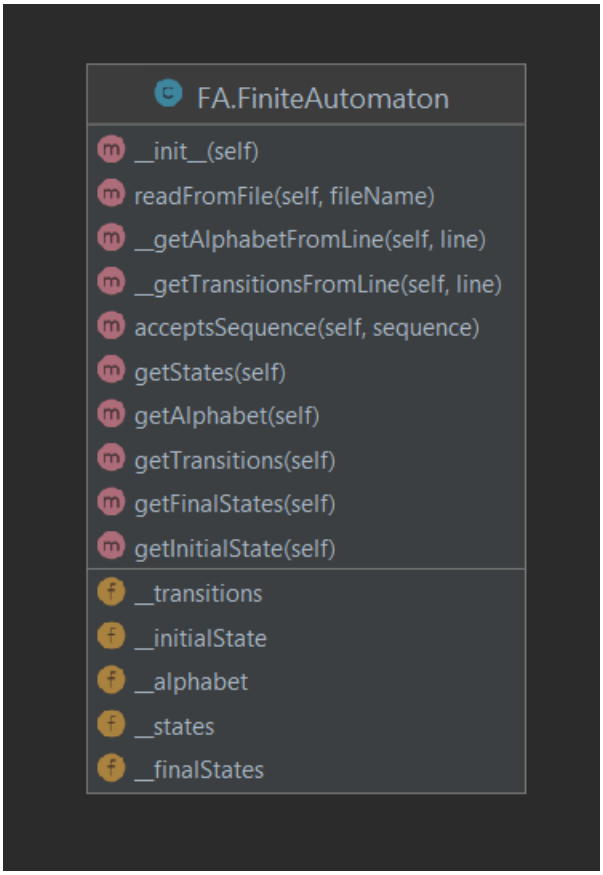
https://github.com/CosminHolcan/FLCD/tree/main/Lab4



This is the FiniteAutomaton class and its fields and methods. As you can see, I have fields for properties of a FA : initial state, final states, all states, alphabet and transitions. I have a function to read a FA from a file; for alphabet and transitions I use also other separate functions because I have some special cases here : for an alphabet I can specify range of symbols under the following format : firstSymbol..lastSymbol (for example, a..z means all leters from a to z inclusive). Also, this is possible for transitions too, when I want a transition from a state s to a state p for using multiple symbols (for example, s,0..9 -> p). Basically, all I am doing is just to take line by line the file, then see what is the content (second part of line, after its description). After this, I just process the content according to its representation and build the whole structure of the FA : for alphabet, all states and final states I am using lists, for transitions a dictionary of type key : (state, symbol), value : state and the initial state is just a string. To verify if a sequence is accepted I start from the initial state which I considered to be the current state and I check if the pair (current state, current symbol from sequence) is a key in the transitions dictionary. If yes, this means the I change the current state to new state from transition current state, symbol -> new state. If not, the algorithm is over and the sequence is not accepted. If I reach the end of the sequence I have to check if the current state is a final one. If yes, sequence is accepted otherwise not.

Also, I integrate the FA in previous homework, scanner program.

Code can be found here: https://github.com/CosminHolcan/FLCD/tree/main/Lab3

Before, I had in Utils file regex functions to determine if a sequence is a constant or an identifier. Now, I changed this by adding 2 more fields in Scanner class : a finite automata for identifiers and one for constants. In init function of Scanner I also read from corresponding files the configurations for the two FAs. Finally, I no longer use the two function from Utils file but the function accepts from FA class to detect if a token is a constant or an identifier.

The EBNF representation of FA file :

{Description: descriptionContent}

Description = “States” | “Alphabet” | “Initial State” | “Transitions” | “Final States”

descriptionContent = statesContent | alphabetContent | initialStateContent | transitionsContent | finalStatesContent

statesContent = letter {, letter }

letter = a..z | A..Z

digit = 0..9

symbol = letter | digit | | “

symbolsRange = (letter | digit) “..”(letter | digit)

alphabetContent = (symbol | symbolsRange) {, (symbol | symbolsRange) }

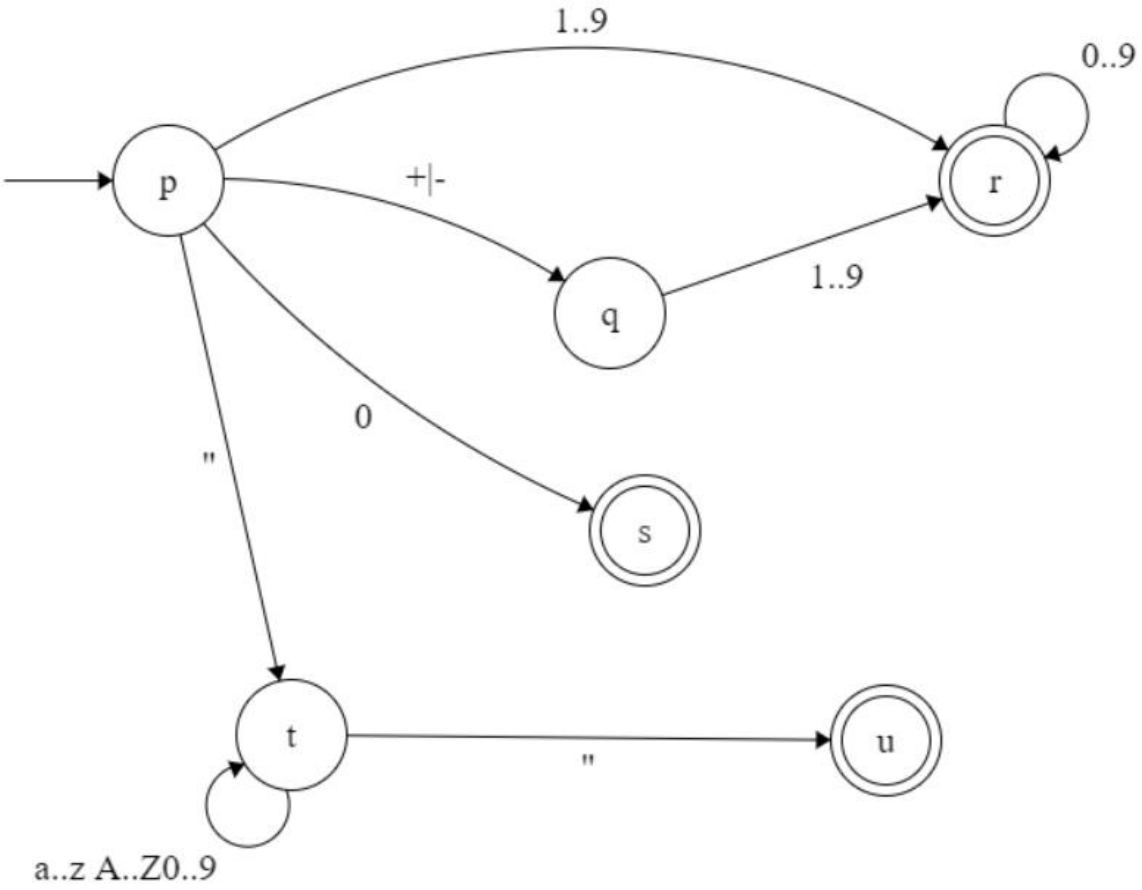
initialStateContent = letter

transition = letter “,” (symbol | symbolsRange) -> letter

transitionsContent = transition {; transition }

finalStatesContent = letter {, letter }

FA for constants



FA for identifiers