Lab 4 –Documentation

Finite Automata contains:

String [] states;
String [] analphabet;
List<Pair<String, String>> transitions; //Pair<key, value>, value is the state where we go
String q0_initial_state;
String [] transvalues;
List<String> finals

The process of verifying if a sequence is accepted by the FA:

```
public boolean isAccepted(String s) throws Exception {
   String current_state = this.q0_initial_state;
   int passedBy = 0;
   int chrNr = 1;
   char[] seq = s.toCharArray();
   for(char chr : seq){
      if(!Arrays.stream(this.e_alphabet).anyMatch(c -> c.equals(String.valueOf(chr))))
         throw new Exception("Not a literal");
      for(String val : trans_values){
         if(val.equals(String.valueOf(chr))) {
            Pair<String, String> transition = this.transitions.get(passedBy);
            current_state = transition.getValue();
            if(this.finals.contains(current_state) && chrNr == seq.length &&
trans_values[passedBy].equals(String.valueOf(chr)))
               return true;
            if(this.finals.contains(current_state) && chrNr != seq.length)
               return false;
            break;
         }
         passedBy += 1;
      }
      chrNr += 1;
   }
   return false;
}
```

Condition for acceptance: the current state is a final state, and the sequence is completely parsed.

The BNF of the input FA file:

Transitions = transition " " {transition}

Transition = "q" digit{digit}

Digit = "0123456789"

Alphabet = Symbol {Symbol}

Symbol = digit

Transvalues = digit " " {digit}