## Home Work 3

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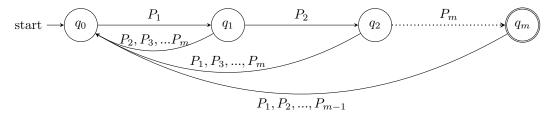
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```
1: procedure NAIVE(On\ input\ S[1,..m])
2: n \leftarrow |T|
3: m \leftarrow |S|
4: for s=0 to n-m do
5: if P[1,..m] = T[s+1...s+m] then
6: print("pattern found")
```

## Question 1

The string matching problem is defined as: "Given a text  $T=T_1...T_n$  which is stored as array T=T[1,...,n], and a pattern  $P=P_1...P_m=P[1...m]$  with m< n, where both are strings over the same alphabet  $\Sigma$ ; decide whether S is a substring of T.

Algorithm 1 is the so-called naive-pattern finding algorithm. Use Algorithm 1 to construct a Finite State. Automata(deterministic or non-deterministic) for solving the matching problem.



## Question 2

Algorithm 1 returns a result in the time proportional to O(|T||S|). Discuss the computation time of your automaton.

In the worst case the automata will have O(|T||S|) complexity. We know this because it iterates through the whole text of size |T| and for each of those iterations it compares at |S|, which is the size of the string, individual items. Thus the automata has the same time complexity as the algorithm.

