

Übungen für die Klausur:

1. Äquivalenz zweier Zustände

Ein wichtiger Vergleich ist die Überprüfung auf Äquivalenz zweier Zustände. Achten Sie bei Ihrer Datenstruktur, dass der Vergleich der Äquivalenz zweier TRIE-Zellen Node1 und Node2 möglichst einfach ist.

Verstehen Sie die Routine in

https://gitlab.cip.ifi.lmu.de/cis/basis_modul_ws2018/tree/loesung/aufgabe3

```
FSA::equivalent(CellFSAPtr Node1, CellFSAPtr Node2):
```

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state. For a given state p (not in the register), we try to find a state q in the register that would have the same right language. To do this, we do not need to compare the languages themselves—comparing sets of strings is computationally expensive. We can use our recursive definition of the right language. State p belongs to the same class as q if and only if:

1. they are either both final or both nonfinal; and
2. they have the same number of outgoing transitions; and
3. corresponding outgoing transitions have the same labels; and
4. corresponding outgoing transitions lead to states that have the same right languages.

Because the postorder method ensures that all states reachable from the states already visited are unique representatives of their classes (i.e., their right languages are unique in the visited part of the automaton), we can rewrite the last condition as:

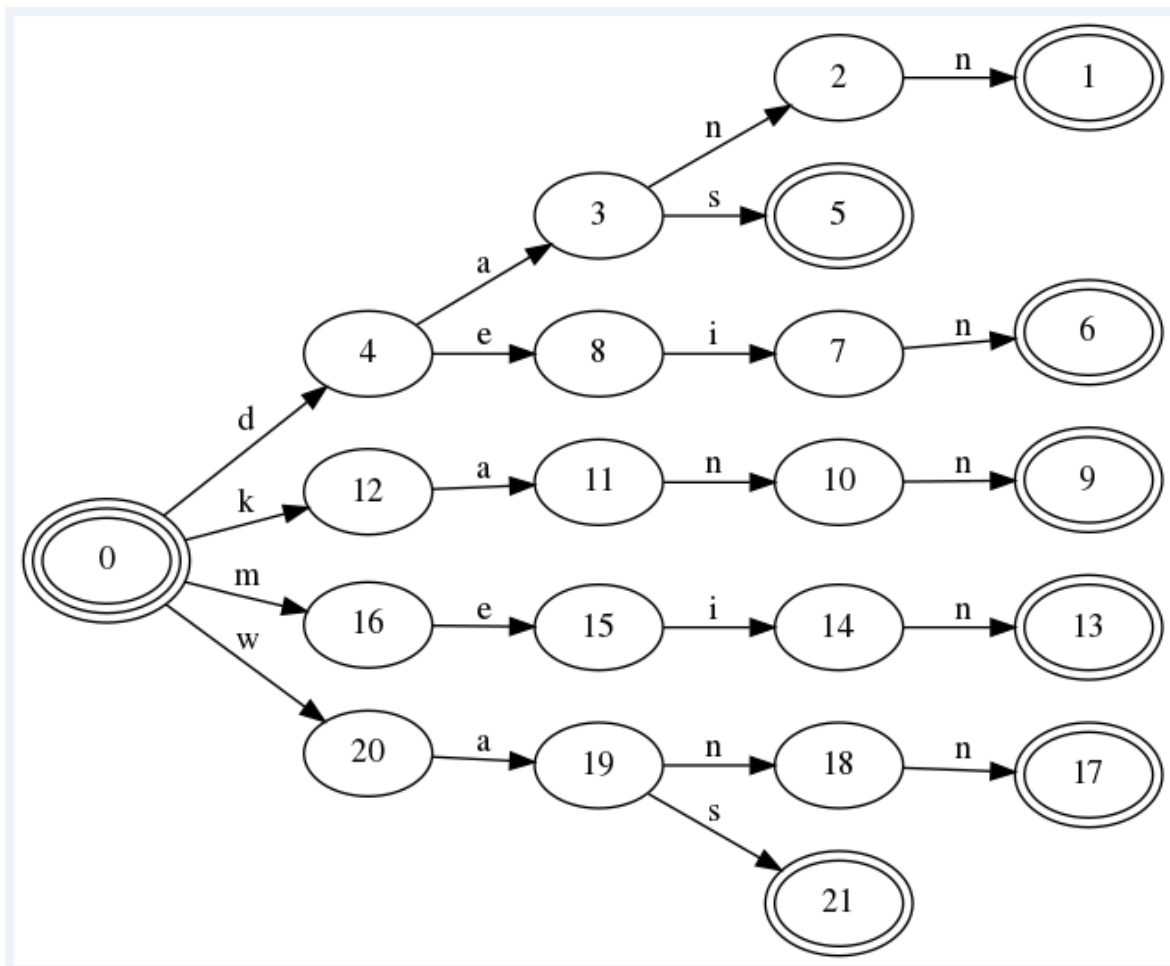
- 4'. corresponding transitions lead to the same states.

If all the conditions are satisfied, the state p is replaced by q . Replacing p simply involves deleting it while redirecting all of its incoming transitions to q . Note that all

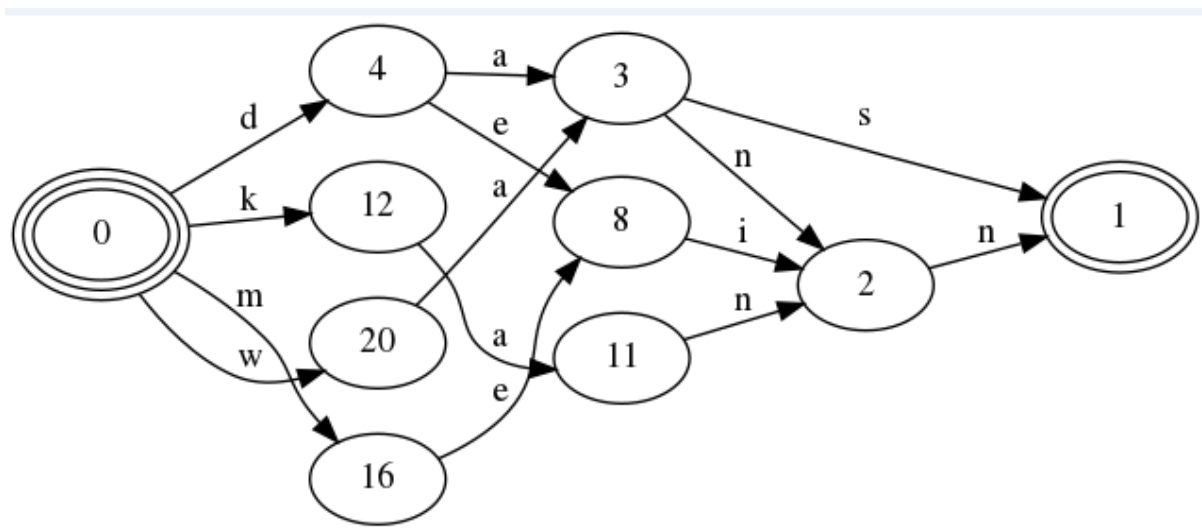
- leaf states belong to the same equivalence class. If some of the conditions are not satisfied, p must be a representative of a new class and therefore must be put into the register.

2. Minimieren Sie einen Trie! Wann sind zwei Zustände Äquivalent

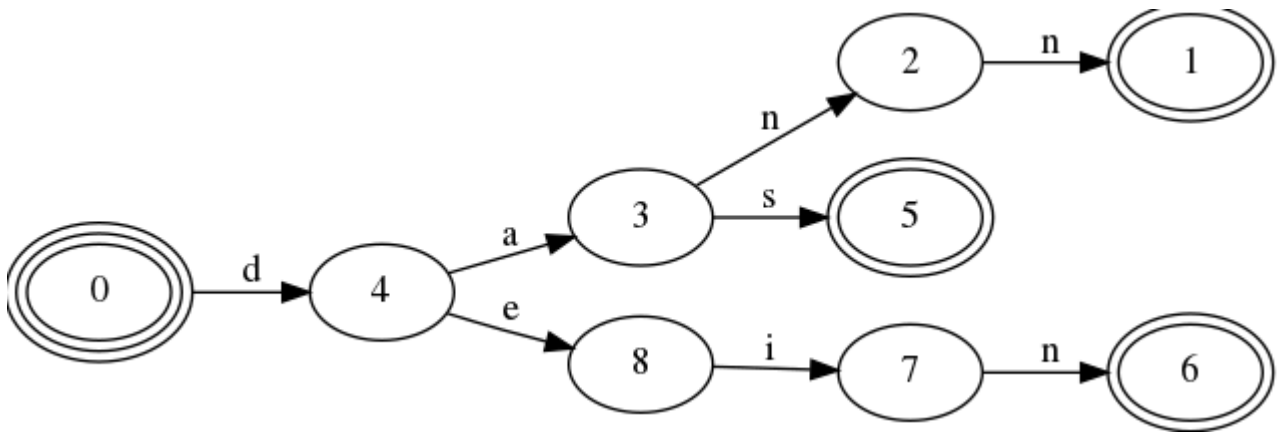
Beispiel 1: nicht optimiert:



Beispiel 1 optimiert:

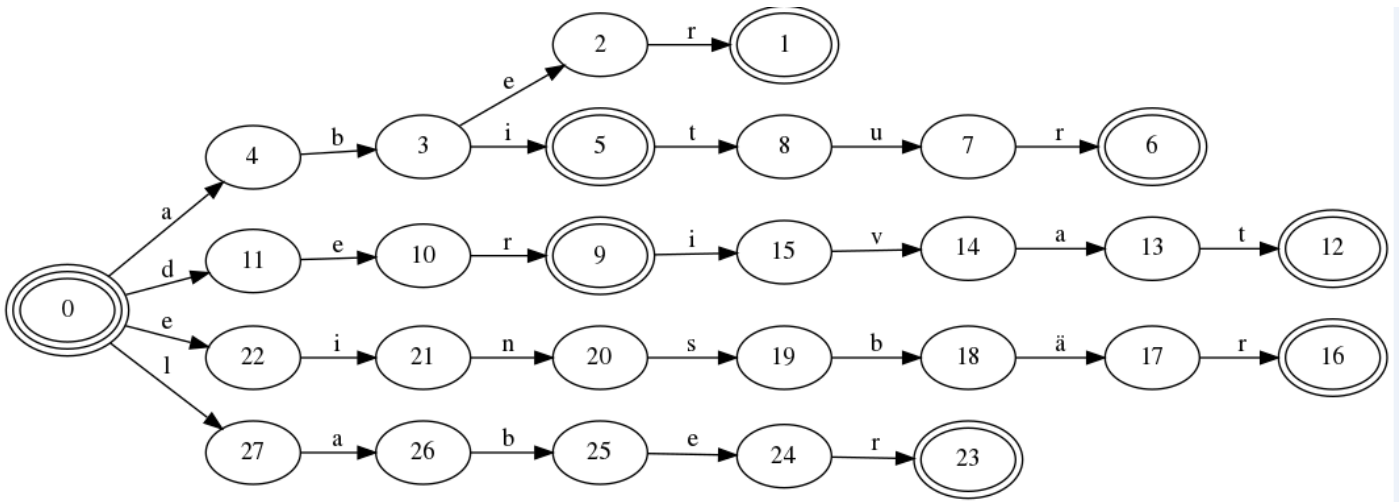


Beispiel 2:



Beispiel 2 optimiert: (bitte eintragen)

Beispiel 3:



Beispiel 3 optimiert (bitte eintragen....)