**Tugas OPK**

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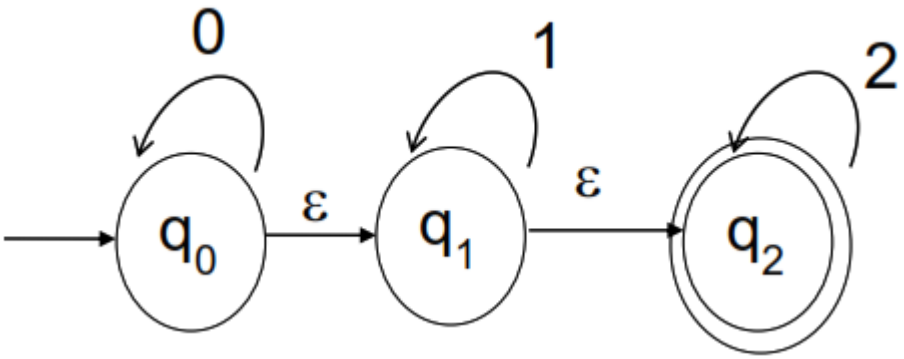
1. Konversi ke DFA dari NDFA e-move




a. Tabel Transisi

| δ | 0 | 1 | 2 |
|---|---|---|---|
| q0 | q0 | {} | {} |
| q1 | {} | q1 | {} |
| q2 | {} | {} | q2 |

b. Closure tiap state

e-closure($q_0$) = [q0,q1,q2]

e-closure($q_1$) = [q1,q2]

e-closure($q_2$) = [q2]

c. Transisi untuk semua pasangan

- δ'(q0,0) = ε_closure (δ(ε_closure(q0,0))

  = ε_closure (δ({q0,q1,q2},0)) = ε_closure ((q0,0) ∪ (q1,0) ∪(q2,0) )

  = ε_closure (q0 ∪ {} ∪ {} ) = q0

  sehingga ε_closure (q0) = **{ q0,q1,q2 }**

- δ'(q0,1) = ε_closure (δ(ε_closure(q0,1))

  = ε_closure (δ({q0,q1,q2},1)) = ε_closure ((q0,1) ∪ (q1,1) ∪(q2,1) )

  = ε_closure ({}∪ q1 ∪ {} ) = q1

  sehingga ε_closure (q1) = **{ q1,q2 }**

- δ'(q0,2) = ε_closure (δ(ε_closure(q0,2))

  = ε_closure (δ({q0,q1,q2},2)) = ε_closure ((q0,2) ∪ (q1,2) ∪(q2,2) )

  = ε_closure ({}∪ {} ∪ q2 ) = q2

sehingga ε_closure (q2) = **{ q2 }**

- δ’(q1,0) = ε_closure (δ(ε_closure(q1,0))

  = ε_closure (δ({q1,q2},0)) = ε_closure ((q1,0) ∪(q2,0) )

  = ε_closure ({}∪ {}) = {}

sehingga ε_closure ({}) = {}

- δ’(q1,1) = ε_closure (δ(ε_closure(q1,1))

  = ε_closure (δ({q1,q2},1)) = ε_closure ((q1,1) ∪ (q2,1) )

  = ε_closure (q1 ∪ {}) = q1

sehingga ε_closure (q1) = **{ q1,q2 }**

- δ’(q1,2) = ε_closure (δ(ε_closure(q1,2))

  = ε_closure (δ({q1,q2},2)) = ε_closure ((q1,2) ∪ (q2,2))

  = ε_closure ({} ∪ q2) = q2

sehingga ε_closure (q2) = **{ q2 }**

- δ’(q2,0) = ε_closure (δ(ε_closure(q2,0))

  = ε_closure (δ({q2},0)) = ε_closure ((q2,0))

  = ε_closure ({}) = {}

sehingga ε_closure ({}) = {}

- δ’(q2,1) = ε_closure (δ(ε_closure(q2,1))

  = ε_closure (δ({q2},1)) = ε_closure ((q2,1))

  = ε_closure ({}) = {}

sehingga ε_closure ({}) = {}

- δ’(q2,2) = ε_closure (δ(ε_closure(q2,2))

  = ε_closure (δ({q2},2)) = ε_closure ((q2,2))

  = ε_closure (q2) = q2

sehingga ε_closure (q2) = **{ q2 }**

d. Tabel Transisi baru

| δ | 0 | 1 | 2 |
|---|---|---|---|
| q0 | q0,q1,q2 | q1,q2 | q2 |
| q1 | {} | q1,q2 | q2 |
| q2 | {} | {} | q2 |

e. Final State baru

Final state awal = q2

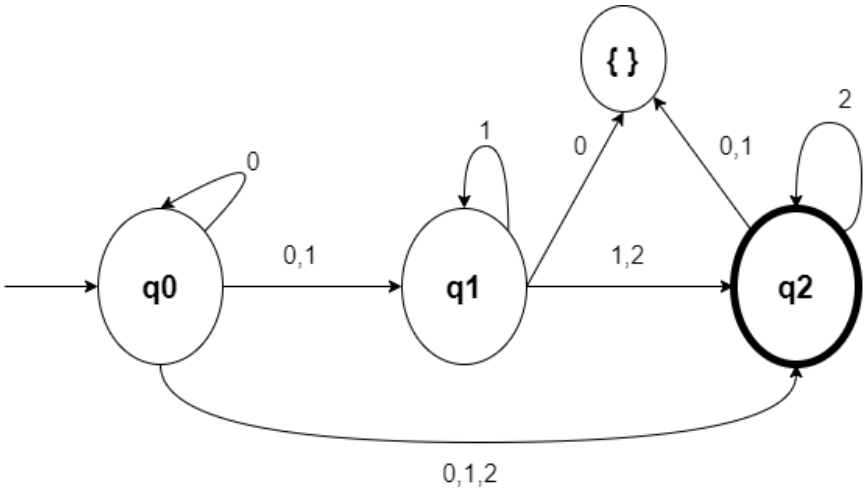
ε_closure (q2) = **{ q2 } 0** dan **{ q2 } 1** dan **{ q2 } 2**

(q2 ,0) dan (q2,1) dan (q2,2)

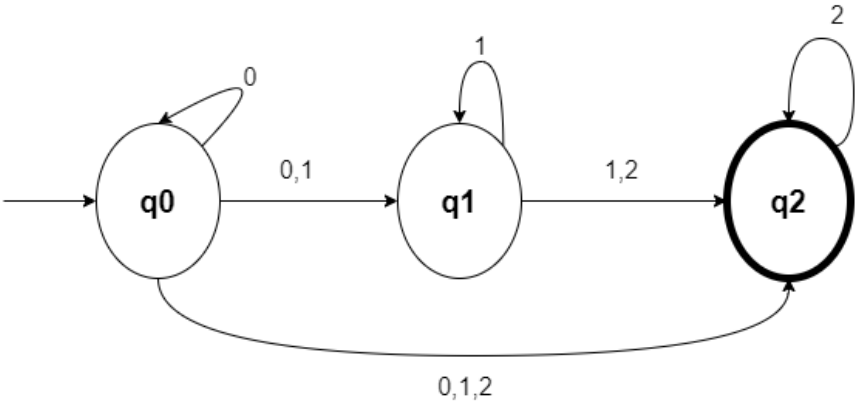
{} dan {} dan q2 = q2

F nya berarti q2 dan q2 = q2

f. Gambar ndfa tanpa e-move nya




Tanpa himp kosong



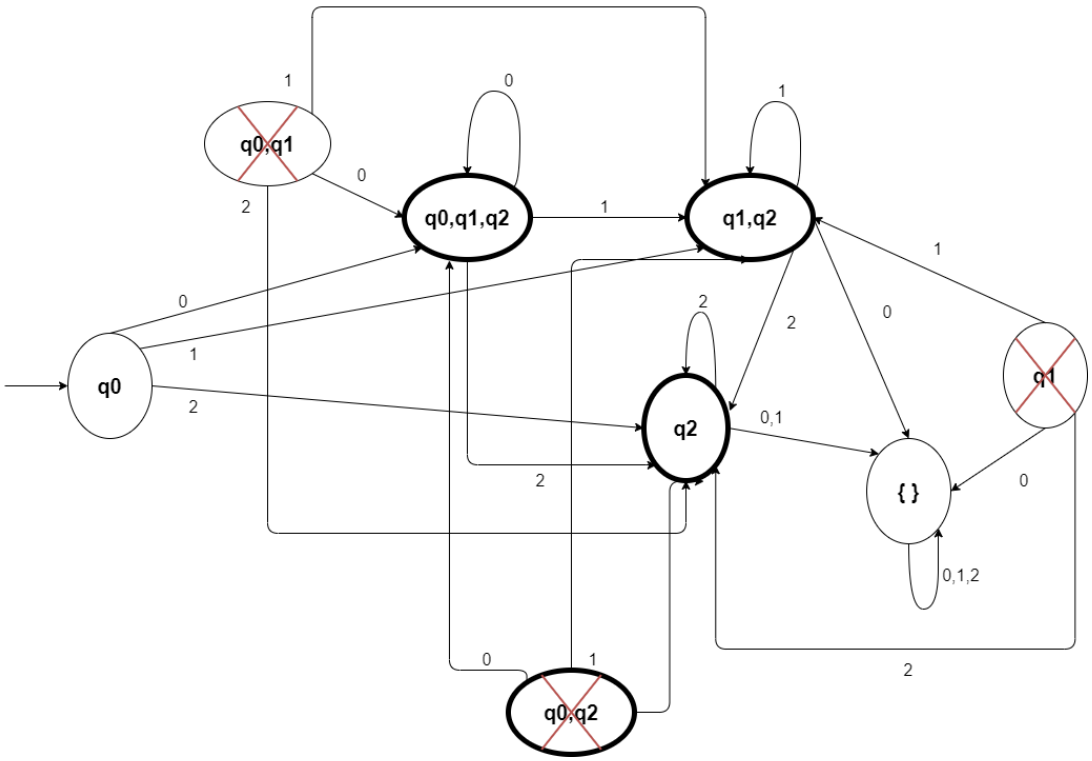
g. Tabel transisi untuk DFA

| δ | 0 | 1 | 2 |
|---|---|---|---|
| {} | {} | {} | {} |
| q0 | q0,q1,q2 | q1,q2 | q2 |
| q1 | {} | q1,q2 | q2 |
| q2 | {} | {} | q2 |
| q0,q1 | q0,q1,q2 | q1,q2 | q2 |
| q0,q2 | q0,q1,q2 | q1,q2 | q2 |
| q1,q2 | {} | q1,q2 | q2 |
| q0,q1,q2 | q0,q1,q2 | q1,q2 | q2 |

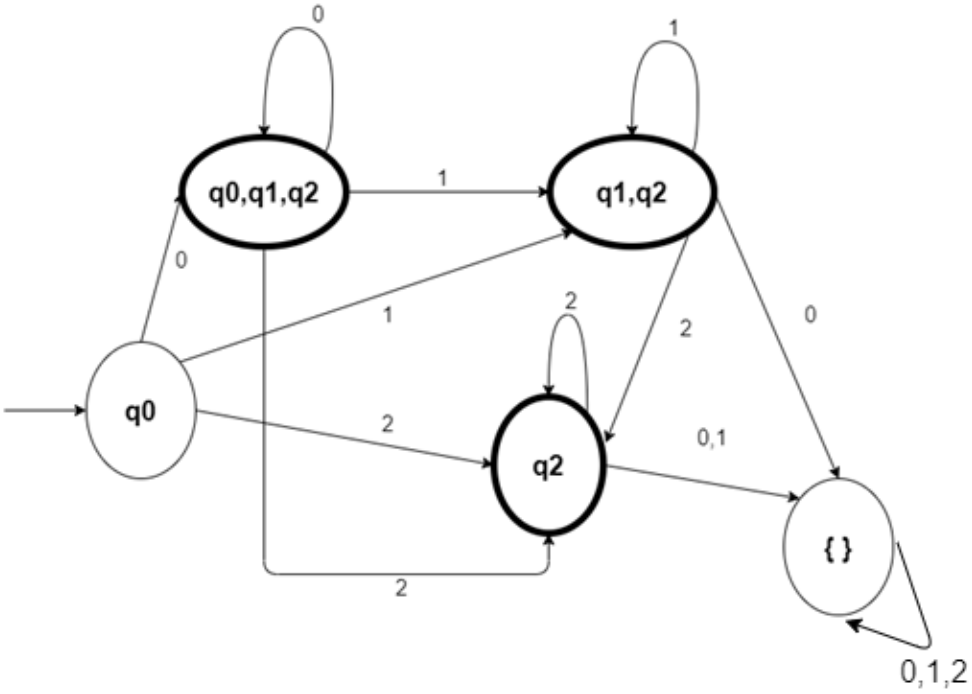
Start state = q0

State Akhir = q2 yaitu {q2},{q0,q1,q2},{ q1,q2}

h. Gambar DFA nya



Dibuang yang tidak perlu menjadi




2. Penyederhanaan CFG

S → ABCd

A→ B | CD | D | ε

B→ abc | ε

C→ cd | ε

D→ e | ε

a. S → ABCd A nya direplace dengan B jadi BBCd
b. BBCd (B dan C direplace ε) nya jadi **d**
c. S → ABCd A nya direplace dengan ε jadi **BCd**
d. BCd (B direplace dengan ε) jadi **Cd**
e. S → ABCd B nya direplace dengan ε jadi **ACd**
f. ACd (C direplace dengan ε) jadi **Ad**
g. S → ABCd C nya direplace dengan ε jadi **ABd**

   Hasil sementara

S → ABCd | BCd | ACd | ABd | Cd | Ad | d

A→ B | CD | D

B→ abc

C→ cd

D→ e

h. Yang satu symbol langsung diganti

S → ABCd | BCd | ACd | ABd | Cd | Ad | d

A→ abc | CD | e

B→ abc

C→ cd

D→ e

i. Selesai dengan hasil akhir

S → ABCd | BCd | ACd | ABd | Cd | Ad | d

A→ abc | CD | e

B→ abc

C→ cd

D→ e