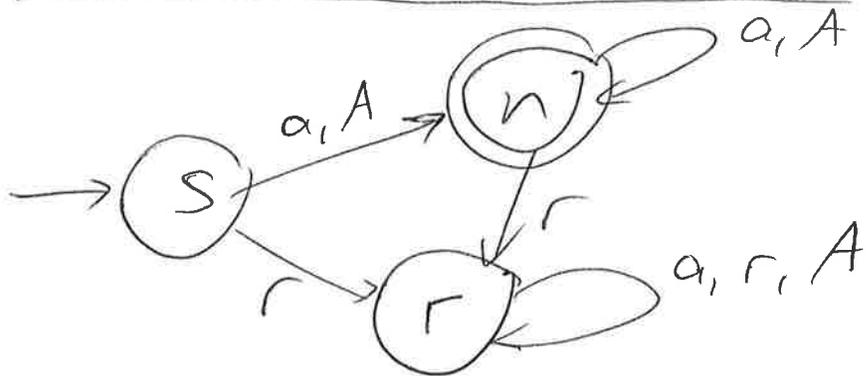


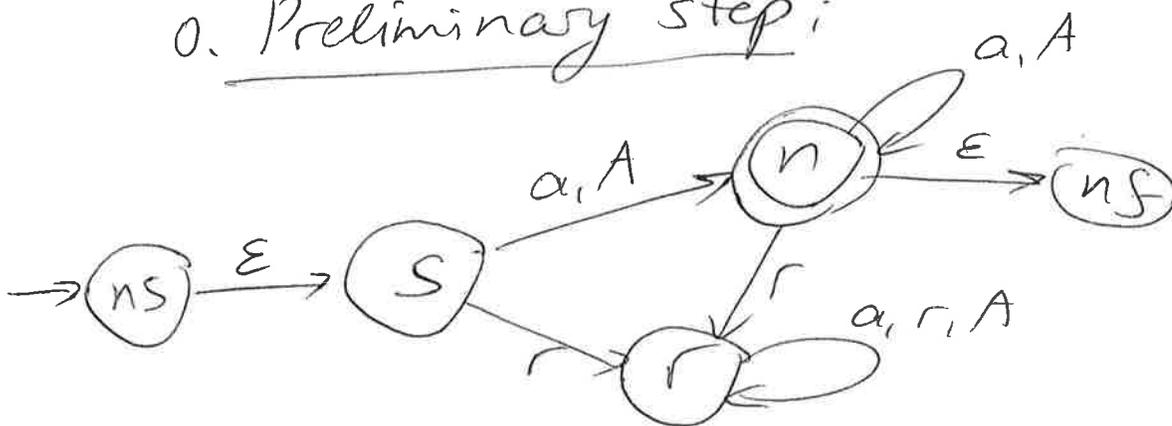
# HW3 SPRING 2024, P1



General formula:

$$R'_{ij} = R_{ij} \cup (R_{ik} R_{kk}^* R_{kj})$$

0. Preliminary step:



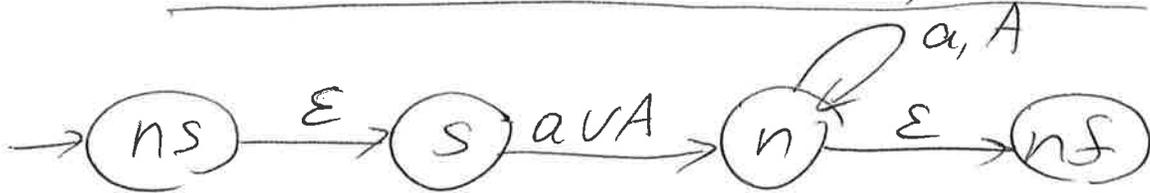
1. Eliminating state r

$$R'_{ij} = R_{ij} \cup (R_{ir} R_{rr}^* R_{rj})$$

For  $j \neq r$ , there are no errors from  $r$  to  $j$ , so  $R_{rj} = \emptyset$ , and concatenation with  $\emptyset$  is  $\emptyset$ .

$$\text{So } R'_{ij} = R_{ij}$$

# HW3, SPRING 2024, P2



## 2. Eliminating state s

$$R'_{ns,n} = R_{ns,n} \cup (R_{ns,s} R_{s,s}^* R_{s,n}) =$$

$$\emptyset \cup (\wedge \emptyset^* (aVA)) =$$

$$\emptyset \cup (\wedge \wedge (aVA)) = aVA$$

$$R'_{ns,nf} = R_{ns,nf} \cup (R_{ns,s} R_{s,s}^* R_{s,nf}) =$$

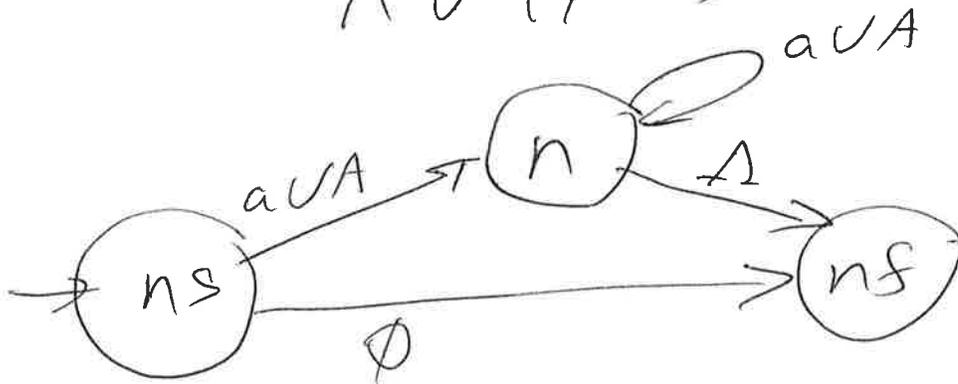
$$= \emptyset \cup (\dots \emptyset) = \emptyset \cup \emptyset = \emptyset$$

$$R'_{n,n} = R_{n,n} \cup (R_{n,s} R_{s,s}^* R_{s,nf}) =$$

$$aVA \cup (\emptyset \dots) = aVA$$

$$R'_{n,nf} = R_{n,nf} \cup (R_{n,s} R_{s,s}^* R_{s,nf}) =$$

$$\wedge \cup (\emptyset \dots) = \wedge$$



HW3, SPRING 2024, P3

3. Eliminating state  $n$ :

$$R'_{ns, ns} = R_{ns, ns} \cup (R_{ns, n} R_{n, n}^* R_{n, ns}) = \\ \emptyset \cup ((aVA)(aVA)^* \Lambda) = \\ (aVA)(aVA)^*$$