NOTE:- Simplifications

1. $\epsilon R = R\epsilon = R$
2. $\phi R = R\phi = \phi$
3. $(\epsilon)^* = \epsilon$ and $(\phi)^* = \epsilon$.
4. $\phi + R = R$.
5. $R + R = R$
6. $RR^* = R^*R = R^+$
7. $(R^*)^* = R$.
8. $\epsilon + RR^* = \epsilon + R^*R = R^*$.
9. $R^*R^* = R^*$
10. $R^* + \epsilon = R^*$
11. $(R+\epsilon)^* = R^*$
12. $(R+\epsilon)R^* = R^*(R+\epsilon) = R^*$.
13. $(R+\epsilon)(R+\epsilon)^*(R+\epsilon) = R^*$.
14. $R^*S + S = R^*S$. , $SR^* + S = SR^*$.
15. $\phi + \epsilon = \epsilon$

NOTE:-

1. $R^* = \{\epsilon, R, RR, RRR, \ldots\}$
2. $RR^* = R\{\epsilon, R, RR, RRR, \ldots\}$
3. $R^+ = \{R, RR, RRR, \ldots\}$.

   $R^*(R+\epsilon)$

   $R^*R + R^*$

   $R^+ + R^*$.
4. $SR^* = \{S, SR, SRR \ldots\} \cup \{S\}$.
5. $R^*S = \{S, RS, RRS \ldots\} \cup \{S\}$.

§. Conversion of DFA to R.E, use the following simplifications for R_{ijk} Method