CMPT 379
Compilers

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Converting Regular Expressions directly into DFAs

This algorithm was first used by Al Aho in `egrep`, and used in `awk`, `lex`, `flex`
Regexp to DFA: \(( (ab) \mid (ba) )^* \)#

```
{1,3}          {1,3,5}
(2,4)          (5)
 *              ε-node     #    {5}
{1,3}          5   (5)
(2,4)          
{1}            {3}
(2)            (4)
{1}             a  {2}  b  {3}  b  {4}  a
(1)             1  (2)  2  (3)  3  (4)  4
```

firstpos = {}
lastpos = ()
Regexp to DFA: followpos

- \textit{followpos}(p)\ tells us which positions can follow a position \( p \)
- There are two rules that use the \textit{firstpos} \{\} and \textit{lastpos} () information

\[
\begin{align*}
\text{followpos}(i) & += k, l \\
\text{followpos}(j) & += k, l
\end{align*}
\]

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\text{followpos}(j) & += k, l
\end{align*}
\]
Regexp to DFA: \((ab) \mid (ba)\)^*#
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