

Assignment 13

Automata & Theory of Computation

Student ID: 2019092824

Name: Lee Kyeong Jun

1. Remove all unit-productions and all λ -productions from the grammar with productions

$$S \rightarrow bC \mid a,$$

$$A \rightarrow aA \mid \lambda,$$

$$B \rightarrow bB \mid \lambda,$$

$$C \rightarrow AB.$$

$$\begin{array}{l} S \rightarrow bC \mid a \\ A \rightarrow aA \mid \lambda \\ B \rightarrow bB \mid \lambda \\ C \rightarrow AB \end{array} \xrightarrow[\lambda]{\text{remove}} \begin{array}{l} S \rightarrow bC \mid a \mid b \\ A \rightarrow aA \mid \lambda \\ B \rightarrow bB \mid b \\ C \rightarrow AB \mid B \mid A \end{array}$$

$(C \rightarrow \lambda)$
 $(A \rightarrow \lambda)$
 $(B \rightarrow \lambda)$
 $(A \rightarrow \lambda), (B \rightarrow \lambda)$

$$\begin{array}{l} S \rightarrow bC \mid a \mid b \\ A \rightarrow aA \mid \lambda \\ B \rightarrow bB \mid b \\ C \rightarrow AB \mid B \mid A \end{array} \xrightarrow[\text{unit}]{\text{Remove}} \begin{array}{l} S \rightarrow bC \mid a \mid b \\ A \rightarrow aA \mid \lambda \\ B \rightarrow bB \mid b \\ C \rightarrow bBaA \mid bBa \mid baA \mid ba \mid bB \mid b \mid aA \mid a \end{array}$$

