1. Convert the grammar with productions to Chomsky normal form:

\[
\begin{align*}
S & \to ABa \\
A & \to aab \\
B & \to Ac
\end{align*}
\]

2. Construct NPDA’s that accept the following languages.

(a) \( L = \{a^n b^{2n} \mid n \geq 0\} \)

(b) \( L = \{a^n b^m c^{n+m} \mid n, m \geq 0\} \)

(c) \( L = \{a^n b^m \mid n \leq m \leq 3n\} \)

(d) \( L = \{w \in \{a, b\}^* \mid n_a(w) \leq n_b(w) \leq 3n_a(w)\} \)

3. Use the CYK algorithm to determine whether the string \( aabba \) are in the language generated by the grammar with productions:

\[
\begin{align*}
S & \to AB \\
A & \to BB \\
A & \to a \\
B & \to AB \\
B & \to b
\end{align*}
\]

Construct a complete table and show all your work.