UnQuiz A Solutions

UnQuiz A was distributed in class on Wednesday, January 23, 2013.

1. This problem concerns the grammar given below.

\[
\begin{align*}
S & \rightarrow A \\
S & \rightarrow B \\
A & \rightarrow cA \\
A & \rightarrow \epsilon \\
B & \rightarrow Bd \\
B & \rightarrow d
\end{align*}
\]

1a. Based on the above grammar, write a derivation for the string “\textit{ddd}”.

We begin with the start symbol (\textit{S}), apply one rule at a time, and finish with the required string.

\[
\begin{align*}
S \\
B \\
Bd \\
Bdd \\
ddd
\end{align*}
\]

1b. Describe the language generated by this grammar.

This language consists of the empty string, all strings consisting of one or more \textit{c}s and all strings consisting of one or more \textit{d}s. In other words, \textit{\epsilon}, \textit{c}, \textit{cc}, \textit{ccc}, \textit{cccc}, \ldots, \textit{d}, \textit{dd}, \textit{ddd}, \textit{dddd}, \ldots.