

2. (a) Consider the following grammar:

$N \rightarrow L$	$L \rightarrow B$	$B \rightarrow "0"$
$N \rightarrow L "." L$	$L \rightarrow L B$	$B \rightarrow "1"$

Explain why this is not an LL(1) grammar, and show a grammar for the same language that is LL(1). [8]

(b) Consider adding multiple assignments of the form

$$\text{var_1} = \text{var_2} = \dots \text{var_n} = \text{Exp}$$

to Java, to give all the variables the value of Exp .. Propose a syntax (productions) for this feature such that it can be parsed with an LR(1) parser. Assume that appropriate syntax for Exp already exists and all variables have already been declared. [9]

(c) LR parsing is based on the construction of what is known as a characteristic finite state machine. Explain clearly how the states of the machine are constructed. [8]