TDT4205 Problem Set 2

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1 Top-down parsing

1.1 LL(1) form

The following grammar is to be transformed to LL(1) form:

$$S \rightarrow sCT|sCTwB$$

$$C \rightarrow c$$

$$T \rightarrow t|\epsilon$$

$$B \rightarrow Ba|a$$

We factor out sCT in the S-production, and remove the left recursion from the B-production. The result:

$$S \rightarrow sCTS'$$

$$S' \rightarrow wB|\epsilon$$

$$C \rightarrow c$$

$$T \rightarrow t|\epsilon$$

$$B \rightarrow aB'$$

$$B' \rightarrow a|\epsilon$$

1.2 Parsing table

$STATE$	$FIRST$	$FOLLOW$
S	$\{s\}$	{\$}
S'	$\{w\}$	{\$}
C	$\{c\}$	$\{t, w\}$
T	$\{t, \epsilon\}$	$\{w\}$
B	$\{a\}$	{\$}
B'	$\{a, \epsilon\}$	{\$}

$STATE$	s	c	t	w	a	\$
S	$S \to sCTS'$					
S'				$S' \to wB$		$S' \to \epsilon$
C		$C \to c$				
T			$T \to t$	$T \to \epsilon$		
B					$B \to aB'$	
B'					$B' \to a$	$B' \to \epsilon$