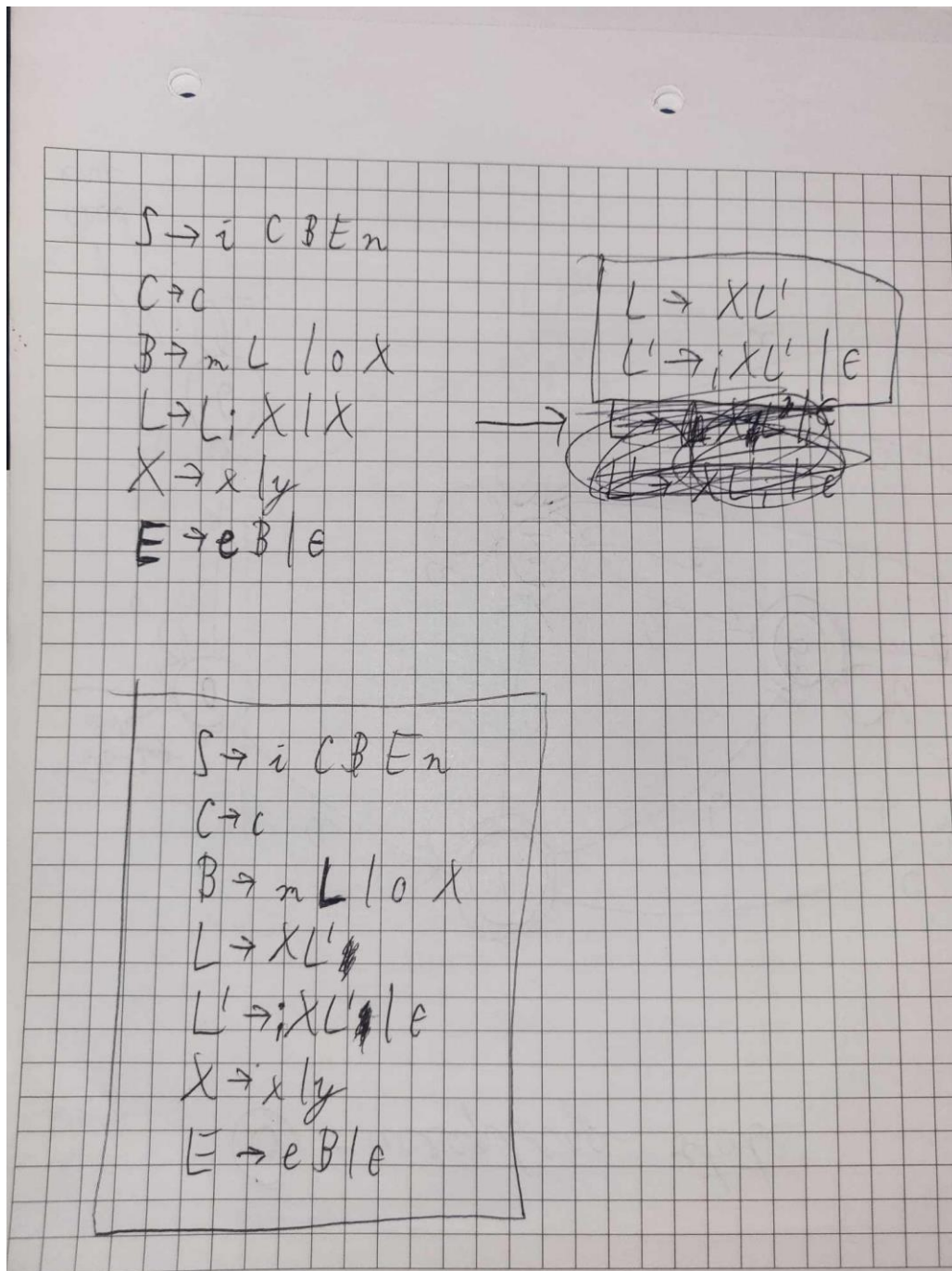# Assignment 2

Compiler Construction
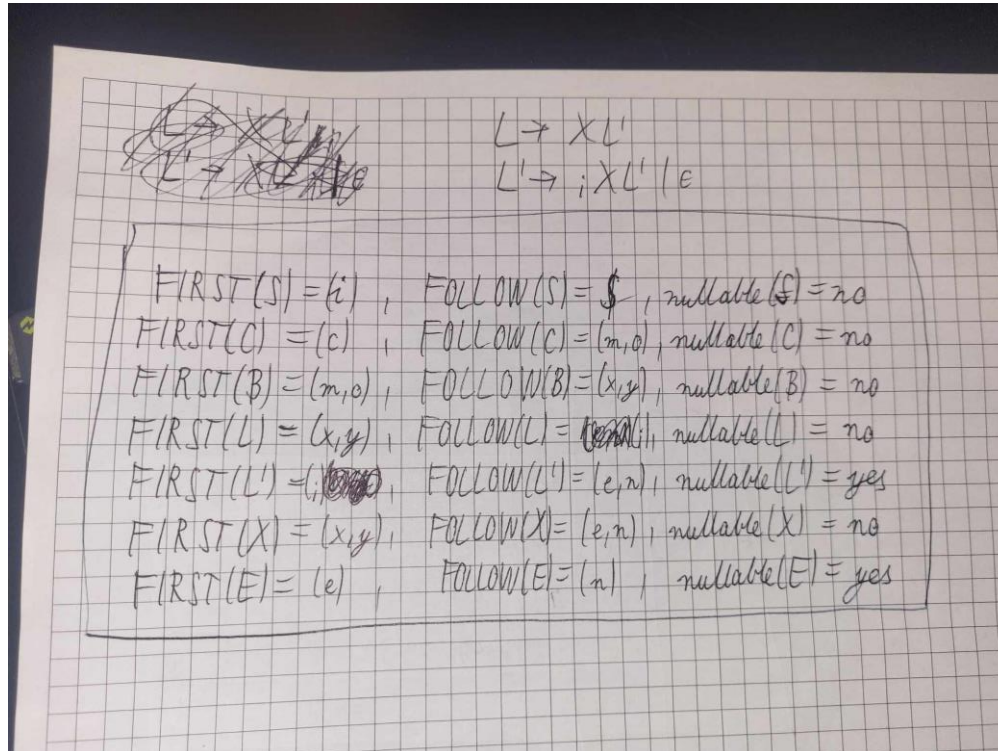
Kacper Multan

Exercise 1

1.1 Adapt the grammar by eliminating any left recursion to make it compatible with top-down LL(1) parsing

$S \to i\ C\ B\ E\ n$

$C \to c$

$B \to n\ L\ |\ o\ X$

$L \to L\ ;\ X\ |\ X$

$X \to x\ |\ y$

$E \to e\ B\ |\ e$

$\longrightarrow$

$L \to X\ L'$

$L' \to ;\ X\ L'\ |\ \epsilon$

$S \to i\ C\ B\ E\ n$

$C \to c$

$B \to n\ L\ |\ o\ X$

$L \to X\ L'$

$L' \to ;\ X\ L'\ |\ \epsilon$

$X \to x\ |\ y$

$E \to e\ B\ |\ e$

1.2 Tabulate the FIRST and FOLLOW sets for each non-terminal, as well as their nullability.

$L \to X L'$

$L' \to ; X L' | \epsilon$

FIRST$(S) = (i)$, FOLLOW$(S) = \$$, nullable$(S) = no$

FIRST$(C) = (c)$, FOLLOW$(C) = (m, o)$, nullable$(C) = no$

FIRST$(B) = (m, o)$, FOLLOW$(B) = (x, y)$, nullable$(B) = no$

FIRST$(L) = (x, y)$, FOLLOW$(L) = (\$, i)$, nullable$(L) = no$

FIRST$(L') = (;, \epsilon)$, FOLLOW$(L') = (\epsilon, n)$, nullable$(L') = yes$

FIRST$(X) = (x, y)$, FOLLOW$(X) = (\epsilon, n)$, nullable$(X) = no$

FIRST$(E) = (e)$, FOLLOW$(E) = (n)$, nullable$(E) = yes$

1.3 Construct the LL(1) parsing table for your grammar.

	i	c	m	o	i	x	y	e	n
S	$S\to iCBEn$								
C		$C\to c$							
B			$B\to mL$	$B\to oX$					
L						$L\to XL'$	$L\to XL'$		
L'					$L'\to ;XL'$			$L'\to\varepsilon$	$L'\to\varepsilon$
X						$X\to x$	$X\to y$		
E									$E\to \varepsilon$