Exercise 1 - Part 3

$E = a b^* b$

$I_0 = C_S(\{\triangle a b^* b\}) = C(\triangle a b^* b) = \{\triangle a b^* b\}$

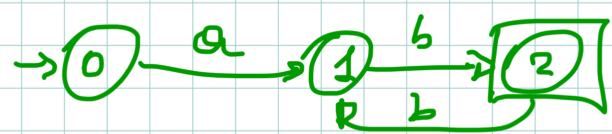
$M(0,a) = C(\triangle b^* b) =$
$= C(\triangle b b^* b) \cup C(\triangle b)$
$= \{\triangle b b^* b, \triangle b\}$
$= I_1$

$M(1,b) = C(\{\triangle b^* b, \triangle\})$
$= C(\triangle b^* b) \cup \{\triangle\}$
$= \{\triangle b b^* b, \triangle b, \triangle\}$
$= I_2$

$M(2,b) = C_S(\{\triangle b^* b, b\}) = I_1$

$A = \{\{0,1,2\}, \{a,b\}, M, 0, \{2\}\}$

$M = \{\langle\langle 0,a\rangle,1\rangle, \langle\langle 1,b\rangle,2\rangle, \langle\langle 2,b\rangle,1\rangle\}$



Is A a minimal automaton?

$\Pi = \langle\{0,1\}, \{2\}\rangle$

$\Pi_1 = \langle\{0\}, \{1\}, \{2\}\rangle$ First Approximation

$\Pi_2 = \langle\{0\}, \{1\}, \{2\}\rangle$ now our final approximation

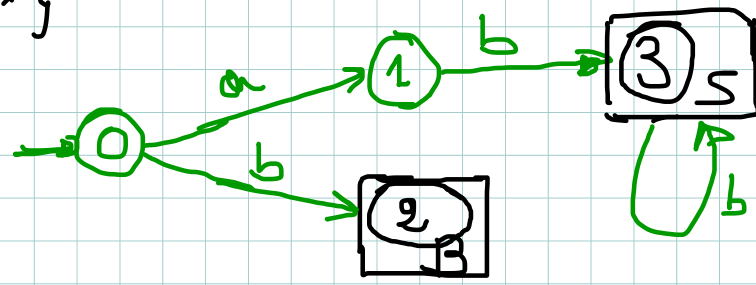
Exercise 2 - part 3

$S ::= AB$
$A ::= a$
$B ::= b b^*$

Here S, B are lexical categories and the only A is an auxiliary nonterminal

$I_0 = C_S(\{S ::=_\Delta AB,\ B ::=_\Delta b b^*\})$
$= C(S ::=_\Delta AB) \cup C(B ::=_\Delta b b^*)$
$= C(S ::=_\Delta aB) \cup \{B ::=_\Delta b b^*\}$
$= \{S ::=_\Delta aB,\ B ::=_\Delta b b^*\}$

$M(0, a) = C_S(\{S ::=_\Delta B\})$
$= C(S ::=_\Delta b b^*)$
$= \{S ::=_\Delta b b^*\} = I_1$



$M(0, b) = C_S(\{B ::=_\Delta b^*\}) = C(B ::=_\Delta b b^*) \cup C(B ::=_\Delta)$
$= \{B ::=_\Delta b b^*,\ B ::=_\Delta\} = I_2$

$M(2, b) = I_2$

$M(I_1, b) = C_S(\{S ::=_\Delta b^*\})$
$= \{S ::=_\Delta b b^*,\ S ::= \Delta\} = I_3$

$M(3, b) = I_3$