



## EASTERN MEDITERRANEAN UNIVERSITY

### Department of Computer Engineering

#### CMSE318 Principles of Programming Languages

#### Problem Set for Chapters 1-4 (Solutions to selected questions)

15. Compute the weakest precondition for the following assignment statements and postconditions:

$$a = 2 * (b - 1) - 1 \{a > 0\}$$

$$2b - 2 - 1 > 0$$

$$2b - 3 > 0$$

$$b > \frac{3}{2}$$

14. Modify the grammar below to add a unary minus operator that has higher precedence than either + or \*.

$\langle \text{assign} \rangle \rightarrow \langle \text{id} \rangle = \langle \text{expr} \rangle$

$\langle \text{id} \rangle \rightarrow A \mid B \mid C$

$\langle \text{expr} \rangle \rightarrow \langle \text{expr} \rangle + \langle \text{term} \rangle$   
 $\mid \langle \text{term} \rangle$

$\langle \text{term} \rangle \rightarrow \langle \text{term} \rangle * \langle \text{factor} \rangle$   
 $\mid \langle \text{factor} \rangle$

$\langle \text{factor} \rangle \rightarrow ( \langle \text{expr} \rangle )$   
 $\mid \langle \text{id} \rangle$

$\langle \text{factor} \rangle \rightarrow - \langle \text{id} \rangle \mid ( \langle \text{expr} \rangle )$

