# Mandatory Assignment 1

Group 1
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This assignment is a part of the Advance Mobile and Distributed Systems Seminar.

## 1 Exercise 1, p. 12

$$\begin{aligned}\text{SYSTEM}_1 &\stackrel{\text{def}}{=} (v\, talk_i, switch_i, give_i, alert_i : i = 1,2)\\ &(\text{CAR}(talk_1, switch_1)|\text{BASE}_1|\text{IDLEBASE}_2|\text{CENTRE}_1)\end{aligned} \tag{1}$$

$$\begin{aligned}\text{CENTRE}_1 &\stackrel{\text{def}}{=} \overline{give_1}\langle talk_2 switch_2\rangle.alert2.\text{CENTRE}_2\\ \text{CENTRE}_2 &\stackrel{\text{def}}{=} \overline{give_2}\langle talk_1 switch_1\rangle.alert1.\text{CENTRE}_1\end{aligned} \tag{2}$$

## 2 Exercise 2, p. 13

$$\begin{aligned}SYSTEM_1 &\equiv (v\overleftarrow{c})(CAR/talk_1, switch_1)|BASE_1|IDLEBASE_2|CENTRE_1)\\ &\to (v\overleftarrow{c})(CAR(talk_1, switch_1)|\overline{switch_1}talk_2 switch_2.IDLEBASE_1\\ &\qquad |IDLEBASE_2|alert_2.CENTRE_2)\\ &\to (v\overrightarrow{c}((CAR(talk_2, switch_2)|IDLEBASE_1\\ &\qquad |IDLEBASE_2|alert_2.CENTRE_2)\\ &\to (v\overrightarrow{c})(CAR(talk_2, switch_2)|IDLEBASE_1|BASE_2|CENTRE_2)\\ &\equiv SYSTEM_2\end{aligned} \tag{3}$$

$$\begin{aligned}\mathrm{CAR}(talk, switch) \stackrel{\mathrm{def}}{=}\ & talk.\mathrm{CAR}(talk, switch) \\ & + switch(talk' switch').\mathrm{CAR}(talk', switch')\end{aligned} \tag{4}$$

$$\begin{aligned}\mathrm{BASE}(talk, switch, give, alert) \stackrel{\mathrm{def}}{=}\ & talk.\mathrm{BASE}(task, switch, give, alert) \\ & + give(talk' switch').\overline{switch}\langle talk' switch'\rangle. \\ & \mathrm{IDLEBASE}(task, switch, give, alert)\end{aligned} \tag{5}$$

$$\mathrm{IDLEBASE}(talk, switch, give, alert) \stackrel{\mathrm{def}}{=} alert.\mathrm{BASE}(talk, switch, give, alert) \tag{6}$$

$$\mathrm{BASE_i} \stackrel{\mathrm{def}}{=} \mathrm{BASE}(talk_i, switch_i, give_i, alert_i) \quad (i = 1, 2) \tag{7}$$

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