Answers to Exercise No 3

$A = \{a1 \mapsto b3, a2 \mapsto b1, a3 \mapsto b3, a2 \mapsto b6\}$
$B = \{b3 \mapsto c1, b1 \mapsto c2, b5 \mapsto c1\}$

1. $\{a1, a3, a4\} \lhd A = \{a1 \mapsto b3, a3 \mapsto b3\}$
2. $B \rhd \{c1, c3\} = \{b1 \mapsto c2\}$
3. $A ; B = \{a1 \mapsto c1, a2 \mapsto c2, a3 \mapsto c1\}$

MACHINE Machine1

SEES Context1

VARIABLES

enroll , register , degree_course

INVARIANTS

inv1 : $enroll \subseteq STUDENT$

inv2 : $degree\_course \subseteq COURSE$

inv3 : $register \in STUDENT \leftrightarrow degree\_course$

inv4 : $dom(register) \subseteq enroll$

EVENTS

Initialisation

begin

act1 : $enroll := \varnothing$

act2 : $register := \varnothing$

act3 : $degree\_course := \varnothing$

end

Event *Enroll* $\widehat{=}$

any s **where**

grd1 : $s \in STUDENT \setminus enroll$

then

act1 : $enroll := enroll \cup \{s\}$

end

Event *Register* $\widehat{=}$

any s , c **where**

grd1 : $s \in enroll$

grd2 : $c \in degree\_course$

grd3 : $s \mapsto c \notin register$

then

act1 : $register := register \cup \{s \mapsto c\}$

end

Event *De_enroll* $\widehat{=}$

any s **where**

grd1 : $s \in enroll$

grd2 : $register[\{s\}] = \varnothing$

then

act1 : $enroll := enroll \setminus \{s\}$

end

Event *removeCourse* $\widehat{=}$

any c **where**

grd1 : $c \in degree\_course$

grd2 : $register \rhd \{c\} = \varnothing$

then

act1 : $degree\_course := degree\_course \setminus \{c\}$

end

END