

An Event-B Specification of Bridge

This project tests extending events.

| | | |
|----------|---|----------|
| 1 | MACHINE Bridge | 2 |
| 1.1 | <i>count</i> | 2 |
| 1.2 | <i>enter(nr)</i> | 2 |
| 1.3 | <i>leave(nr)</i> | 2 |
| 2 | REFINEMENT WithDrawBridge | 3 |
| 2.1 | <i>draw_bridge_open</i> | 3 |
| 2.2 | <i>setBridge(state)</i> | 3 |
| 2.3 | <i>enter</i> extends enter | 3 |
| 2.4 | <i>leave</i> extends leave | 3 |

VARIABLES

1.1

count Number of cars on bridge

INVARIANTS

inv1: $count \in \mathbb{N}$

inv2: $count \geq 0$

inv3: $count \leq 10$

EVENT **INITIALISATION**

THEN

init1: $count := 0$

END

EVENT **enter**

1.2

ANY

nr

WHERE

grd1: $nr \in \mathbb{N}$

grd2: $count + nr \leq 10$

THEN

act1: $count := count + nr$

END

EVENT **leave**

1.3

ANY

nr

WHERE

grd1: $nr \in \mathbb{N}$

grd2: $count - nr \geq 0$

THEN

act1: $count := count - nr$

END

REFINEMENT **WithdrawBridge**

2

REFINES **Bridge**

VARIABLES

2.1

draw_bridge_open If true, then the bridge is open and cars cannot enter the bridge.

INVARIANTS

inv1: *draw_bridge_open* ∈ BOOL

EVENT **INITIALISATION**

EXTENDS **INITIALISATION**

THEN

init1_1: *draw_bridge_open* := **TRUE**

END

EVENT **setBridge**

2.2

ANY

state

WHERE

grd1_1: *state* ∈ BOOL

THEN

act1_1: *draw_bridge_open* := *state*

END

EVENT **enter**

2.3

EXTENDS **enter**

WHERE

grd1_1: *draw_bridge_open* = **FALSE**

END

EVENT **leave**

2.4

EXTENDS **leave**

WHERE

grd1_1: *draw_bridge_open* = **FALSE**

END

Bridge, 2, 3
count, 2
draw_bridge_open, 3
enter, 2, 3
INITIALISATION, 2, 3
leave, 2, 3
setBridge, 3
WithdrawBridge, 3