

# An Event-B Specification of Bridge

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This project tests extending events.

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