```
1  MACHINE mac1
2  VARIABLES
3    cars_go, peds_go
4  INVARIANTS
5    inv1 : cars_go ∈ BOOL
6    inv2 : peds_go ∈ BOOL
7    inv3 : ¬ (peds_go = true ∧ cars_go =
   true)
8  EVENTS
9    Initialisation
10     begin
11       act1 : cars_go := false
12       act2 : peds_go := false
13     end
14   Event set_peds_go ≙
15     when
16       grd1 : cars_go = false
17     then
18       act1 : peds_go := true
19     end
20   Event set_peds_stop ≙
21     begin
22       act1 : peds_go := false
23     end
24   Event set_cars_go ≙
25     when
26       grd1 : peds_go = false
27     then
28       act1 : cars_go := true
29     end
30   Event set_cars_stop ≙
31     begin
32       act1 : cars_go := false
33     end
34 END
```

Fig. 1: Event-B machine specification for a traffic system, with cars and pedestrians controlled by boolean flags.

```
1  CONTEXT ctx1
2  SETS
3    COLOURS
4  CONSTANTS
5    red, green, orange
6  AXIOMS
7    axm1 : partition(COLOURS, {red}, {green},
   {orange})
8  END
```

Fig. 2: Event-B context specification for the colours of a set of traffic lights.

```
1  MACHINE mac2
2  refines mac1
3  SEES ctx1
4  VARIABLES
5    cars_colour, peds_colour, buttonpushed
6  INVARIANTS
7    inv1 : peds_colour ∈ {red, green}
8    inv2 : (peds_go = TRUE) ⇔ (peds_colour =
   green)
9    inv3 : cars_colour ∈ {red, green}
10   inv4 : (cars_go = TRUE) ⇔ (cars_colour =
   green)
11   inv5 : buttonpushed ∈ BOOL
12 EVENTS
13   Initialisation
14     begin
15       act1 : cars_colour := red
16       act2 : peds_colour := red
17     end
18   Event set_peds_green ≙
19   refines set_peds_go
20     when
21       grd1 : cars_colour = red
22       grd2 : buttonpushed = true
23     then
24       act1 : peds_colour := green
25       act2 : buttonpushed := false
26     end
27   Event set_peds_red ≙
28   refines set_peds_stop
29     begin
30       act1 : peds_colour := red
31     end
32   Event set_cars_green ≙
33   refines set_cars_go
34     when
35       grd1 : peds_colour = red
36     then
37       act1 : cars_colour := green
38     end
39   Event set_cars_red ≙
40   refines set_cars_stop
41     begin
42       act1 : cars_colour := red
43     end
44   Event press_button ≙
45     begin
46       act1 : buttonpushed := true
47     end
48 END
```

Fig. 3: A refined Event-B machine specification for a traffic system, with cars and pedestrians controlled by a button-activated set of pedestrian lights.