

```

scheme
THEATRE =
  class
    type
      Database = Performance  $\overrightarrow{m}$  Reservations,
      Reservations = Seat  $\overrightarrow{m}$  Status,
      Status == free | reserved_by(s_p : Person),
      Performance,
      Person,
      Seat

    value
      free_seats : Performance  $\times$  Database  $\xrightarrow{\sim}$  Seat-set
      free_seats(p, t)  $\equiv$  { s | s : Seat  $\bullet$  s  $\in$  dom t(p)  $\wedge$  t(p)(s) = free } pre p  $\in$  dom t,

      mk_reservation : Person  $\times$  Seat  $\times$  Performance  $\times$  Database  $\xrightarrow{\sim}$  Database
      mk_reservation(id, s, p, t)  $\equiv$ 
        t  $\uparrow$  [ p  $\mapsto$  t(p)  $\uparrow$  [ s  $\mapsto$  reserved_by(id) ] ]
        pre p  $\in$  dom t  $\wedge$  s  $\in$  free_seats(p, t)
    end

```

```

scheme
THEATRE2 =
  class
    type
      Database = { | t : Database'  $\bullet$  is_wff(t) | },
      Database' = Seat-set  $\times$  (Performance  $\overrightarrow{m}$  (Seat  $\overrightarrow{m}$  Person)),
      Performance,
      Person,
      Seat

    value
      is_wff : Database'  $\rightarrow$  Bool
      is_wff(ss, t)  $\equiv$  ( $\forall$  p : Performance  $\bullet$  p  $\in$  dom t  $\Rightarrow$  dom t(p)  $\subseteq$  ss),

      free_seats : Performance  $\times$  Database  $\xrightarrow{\sim}$  Seat-set
      free_seats(p, (ss, t))  $\equiv$  ss  $\setminus$  dom t(p) pre p  $\in$  dom t,

      mk_reservation : Person  $\times$  Seat  $\times$  Performance  $\times$  Database  $\xrightarrow{\sim}$  Database
      mk_reservation(id, s, p, (ss, t))  $\equiv$ 
        (ss, t  $\uparrow$  [ p  $\mapsto$  t(p)  $\cup$  [ s  $\mapsto$  id ] ])
        pre p  $\in$  dom t  $\wedge$  s  $\in$  free_seats(p, (ss, t))
    end

```