

# DATABASE[G]\*

**feature** {NONE} -- Implementation

data: **ARRAY**[G]

**feature** -- Commands

add\_item\* (g: G)

-- Add new item `g` into database.

**require**

*non\_existing\_item*:  $\neg$  exists (g)

**ensure**

*size\_incremented*: count = **old** count + 1

*item\_added*: exists (g)

**feature** -- Queries

count+: **INTEGER**

-- Number of items stored in database

**ensure**

*correct\_result*: **Result** = data.count

exists\* (g: G): **BOOLEAN**

-- Does item `g` exist in database?

**ensure**

*correct\_result*: **Result** =  $(\exists i : 1 \leq i \leq \text{count} : \text{data}[i] \sim g)$

DATABASE\_V1[G]+

## DATABASE\_V2[G]+

**feature** {NONE} -- Implementation

data: **ARRAY**[G]

**feature** -- Commands

add\_item++ (g: G)

-- Insert new item `g` into the right slot of `data`.

**feature** -- Queries

count+: **INTEGER**

-- Number of items stored in database

exists++ (g: G): **BOOLEAN**

-- Perform a binary search on `data` array.

**invariant**

*sorted\_data*:  $\forall i : 1 \leq i < \text{count} : \text{data}[i] < \text{data}[i + 1]$