

SOEN 331: Introduction to Formal Methods  
for Software Engineering  
Assignment 4 on Algebraic Specifications

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**Spec:** Set (Element);

**Sort:** Set;

**Imports:** Boolean,  $\mathbb{N}_0$ ;

**Operations:**

newset  $\rightarrow$  Set;

add : Set  $\times$  Element  $\rightarrow$  Set;

remove : Set  $\times$  Element  $\rightarrow$  Set;

size : Set  $\rightarrow \mathbb{N}_0$ ;

isempty : Set  $\rightarrow$  Boolean;

ismember : Set  $\times$  Element  $\rightarrow$  Boolean;

**Variables:**

s: Set; x, y: Element;

**Axioms:**

[A1] isempty(newset) = true;

[A2] ismember(newset, x) = false;

[A3] ismember(add(s, x), x) = true;

[A4] add(add(s, x), y) = add(add(s, y), x);