OGO 2.2 Groep 2
Specificatie opdracht 1b

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1 Introduction

A pascal unit with the name 'Process' must be made, containing the procedures and functions defined in the following section.

The specification language used is 'Hoare logic'.

In this specification we use a (global) variable A, wich is a list of integers, initially empty.

2 Functions

2.1 Add(n)

Pascal function declaration:
```
procedure Add (var n :  integer);
```

Specification:
$\{A = A' \wedge n \in \mathbb{Z}\}$
$Add(n)$
$\{(((\exists x : x \in \mathbb{Z} : n = x^3) \wedge (\neg n \lessdot A)) \implies (A = A' +\!\!+ [n])) \wedge$
$((\neg(\exists x : x \in \mathbb{Z} : n = x^3) \vee (n \lessdot A)) \implies (A = A'))\}$

2.2 Sort()

Pascal function declaration:
`procedure Sort ();`

Specification:
$\{A = A'\}$
$Sort()$
$\{(\forall i \in \mathbb{N} : 0 \leq i < \#A - 1 : A[i] \leq A[i+1]) \wedge$
$(\forall n \in \mathbb{N} : \#\{i | 0 \leq i < \#A \wedge A[i] = n\} = \#\{i | 0 \leq i < \#A' \wedge A'[i] = n\})\}$

2.3 Median()

Pascal function declaration:
`function Median () :  integer;`

Specification:
$\{(\forall i \in \mathbb{N} : 0 \leq i < \#A - 1 : A[i] \leq A[i+1])\}$
$Median()$
$\{(\#A > 0 \implies result = A[\lfloor \frac{\#A}{2} \rfloor]) \wedge (\#A = 0 \implies result = nil)\}$

Returns:
The value of 'result' must be returned by the Median function.