MaskD specification language

Luciano Putruele

Departamento de Computación, FCEFQyN, Universidad Nacional de Río Cuarto,
Río Cuarto, Córdoba, Argentina, lputruele@gmail.com

Abstract. This document describes the grammar of the MaskD Guarded Language

1 Introduction

In this document we present the grammar of the design language for the MaskD tool.

2 Grammar

The language Faulty is a simple guarded language:

⟨*specification*⟩	::=	⟨*globals*⟩ ’;’ ⟨*process_list*⟩ ⟨*main_program*⟩ ’;’
⟨*globals*⟩	::=	⟨*global_decl*⟩
	|	⟨*globals*⟩ ‘;’ ⟨*global_decl*⟩
⟨*global_decl*⟩	::=	global ID : ⟨*type*⟩
⟨*process_list*⟩	::=	⟨*process*⟩
	|	⟨*process_list*⟩ ‘;’ ⟨*process*⟩
⟨*process*⟩	::=	process ID ⟨*params*⟩ ‘ { ’ ⟨*decl_list*⟩ ’;’ ⟨*initial_cond*⟩ ’;’ ⟨*norm_cond*⟩ ’;’ ⟨*branch_list*⟩ ’;’ ‘}’
⟨*initial_cond*⟩	::=	initial ‘:’ ⟨*expr*⟩
⟨*norm_cond*⟩	::=	normative ‘:’ ⟨*expr*⟩
⟨*params*⟩	::=	⟨*param*⟩
	|	⟨*params*⟩ ‘,’ ⟨*param*⟩

⟨*param*⟩ ::= ID : ⟨*type*⟩

⟨*decl_list*⟩ ::= ⟨*decl*⟩
| ⟨*decl_list*⟩ ‘`;`’ ⟨*decl*⟩

⟨*decl*⟩ ::= ⟨*vbles_decl*⟩ ‘`:`’ ⟨*type*⟩

⟨*vbles_decl*⟩ ::= ID
| ⟨*vbles_decl*⟩ ‘`,`’ ID

⟨*type*⟩ ::= bool

⟨*branch_list*⟩ ::= ⟨*branch*⟩
| ⟨*branch_list*⟩ ‘`;`’ ⟨*branch*⟩

⟨*branch*⟩ ::= ⟨*label*⟩ ⟨*mode*⟩ ⟨*expr*⟩ ‘`->`’ ⟨*assig_list*⟩
| ⟨*label*⟩ ⟨*expr*⟩ ‘`->`’ ⟨*assig_list*⟩
| ⟨*mode*⟩ ⟨*expr*⟩ ‘`->`’ ⟨*assig_list*⟩
| ⟨*expr*⟩ ‘`->`’ ⟨*assig_list*⟩

⟨*label*⟩ ::= [ID]

⟨*mode*⟩ ::= internal
| faulty

⟨*assign_list*⟩ ::= ⟨*assign*⟩
| ⟨*assign_list*⟩ ‘`,`’ ⟨*assign*⟩

⟨*assign*⟩ ::= ID ‘`=`’ ⟨*expr*⟩

⟨*expr*⟩ ::= ⟨*disjuntion*⟩

⟨*disjuntion*⟩ ::= ⟨*conjuntion*⟩
| ⟨*disjuntion*⟩ ‘`||`’ ⟨*conjuntion*⟩

⟨*conjuntion*⟩ ::= ⟨*comparation*⟩
| ⟨*conjuntion*⟩ ‘`&&`’ ⟨*comparation*⟩

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⟨comparation⟩       ::= ⟨factor⟩
                     |  ⟨factor⟩ ‘==’ ⟨factor⟩

⟨factor⟩            ::= ⟨primary⟩
                     |  ‘!’ ⟨factor⟩

⟨primary⟩           ::= true
                     |  false
                     |  ID
                     |  ‘(’ ⟨expr⟩ ‘)’

⟨main_program⟩      ::= main ‘(’ ‘)’ ‘{’ ⟨body_main⟩ ‘}’

⟨body_main⟩         ::= ⟨process_decl⟩ ⟨process_inv⟩ ‘;’

⟨process_decl⟩      ::= ⟨proc⟩
                     |  ⟨process_decl⟩ ‘;’ ⟨proc⟩

⟨proc⟩              ::= ⟨vbles_decl⟩ ‘:’ ⟨type_proc⟩

⟨type_proc⟩         ::= ID

⟨process_inv⟩       ::= ⟨inv⟩
                     |  ⟨process_inv⟩ ‘;’ ⟨inv⟩

⟨inv⟩               ::= run ID‘(’ ‘)’
                     |  run ID ‘(’ ⟨ids⟩ ‘)’

⟨ids⟩               ::= ID
                     |  ⟨ids⟩ ‘,’ ID
```