"Official" Rock-Scissors-Paper Rules

Bart Massey

January 25, 2016

In this document we define "official" (not actually official) rules for Rock-Scissor-Paper (RSP).

A round of RSP involves two players.

$$PLAYER ::= player1 \mid player2$$

Each round, the players simultaneously choose one of three hand signs: rock, scissors or paper.

$$SIGN ::= rock \mid paper \mid scissors$$

<div style="border">

___ *StartRound* _____

$choice? : PLAYER \rightarrow SIGN$

</div>

If the players choose different signs, the winner is determined by a dominance relation: rock defeats scissors, scissors, scissors defeats paper, paper defeats rock.

$defeats : SIGN \rightarrowtail SIGN$
_____
$defeats = \{(rock, scissors), (scissors, paper), (paper, rock)\}$

If the players choose the same sign, the round results in a tie.

$$RESULT ::= tie \mid win1 \mid win2$$

When the round is over, a result will have been determined.

<div style="border">

___ *Round* _____

StartRound
$result! : RESULT$
_____
$(choice?\, player1 = choice?\, player2 \land result! = tie)\ \lor$
$((choice?\, player1, choice?\, player2) \in defeats \land result! = win1)\ \lor$
$((choice?\, player2, choice?\, player1) \in defeats \land result! = win2)$

</div>