

MACHINE
machine(x)
CONSTRAINTS
C
SETS
E
CONSTANTS
y
PROPERTIES
P
VARIABLES
z
INVARIANT
I
ASSERTIONS
J
INITIALISATION
G
OPERATIONS
opname = PRE L THEN H END
END

$\exists x \bullet C$

$C \Rightarrow \exists (E, y \bullet P)$

$C \wedge P \Rightarrow \exists z \bullet I$

$C \wedge P \wedge I \Rightarrow J$

$C \wedge P \Rightarrow [G]I$

$C \wedge P \wedge J \wedge I \wedge L \Rightarrow [H]I$

$[G_R] \neg [G_A] \neg I_R$

$I_A \wedge I_R \wedge L_A \Rightarrow L_R \wedge [H'_R] \neg [H_A] \neg (I_R \wedge y' = y)$

Helyettesítések

$BEGIN\ S\ END \equiv S$

$[skip]P \iff P$

$[x := E]P \iff P^{x \leftarrow E}$

$[x, y := E, F]P \iff [z := F][x := E][y := z]P$

$[fct(E1) := E2]P \iff [fct := fct \Leftarrow \{E1 \mapsto E2\}]P$

$[PRE\ P\ THEN\ S\ END]R \iff P \wedge [S]R$
 $I \wedge P \Rightarrow [S]I$

$[ASSERT\ P\ THEN\ S\ END]R \iff P \wedge (P \Rightarrow [S]R)$

$[CHOICE\ S1\ OR\ \dots\ OR\ Sn\ END]P \iff [S1]P \wedge \dots \wedge [Sn]P$

$[IF\ P\ THEN\ S\ ELSE\ T\ END]R \iff (P \Rightarrow [S]R) \wedge (\neg P \Rightarrow [T]R)$

$[IF\ P1\ THEN\ S1\ ELSIF\ P2\ THEN\ S2\ \dots$
 $ELSIF\ Pn\ THEN\ Sn\ ELSE\ T\ END]R \iff$
 $(P1 \Rightarrow [S1]R) \wedge ((\neg P1 \wedge P2) \Rightarrow [S2]R) \wedge \dots$
 $\wedge ((\neg P1 \wedge \dots \wedge \neg Pn-1 \wedge Pn) \Rightarrow [Sn]R) \wedge$
 $((\neg P1 \wedge \dots \wedge \neg Pn) \Rightarrow [T]R)$

$[SELECT\ P1\ THEN\ S1\ WHEN\ P2\ THEN\ S2\ \dots$
 $WHEN\ Pn\ THEN\ Sn\ ELSE\ T\ END]R \iff$
 $(P1 \Rightarrow [S1]R) \wedge (P2 \Rightarrow [S2]R) \wedge \dots$
 $\wedge (Pn \Rightarrow [Sn]R) \wedge ((\neg P1 \wedge \neg P2 \wedge \dots \wedge \neg Pn) \Rightarrow [T]R)$

$CASE\ E\ OF\ EITHER\ L1\ THEN\ S1\ OR\ L2\ THEN\ S2\ \dots$
 $OR\ Ln\ THEN\ Sn\ ELSE\ T\ END\ END =$
 $SELECT\ E \in \{L1\}\ THEN\ S1\ OR\ E \in \{L2\}\ THEN\ S2\ OR\ \dots$
 $OR\ E \in \{Ln\}\ THEN\ Sn\ ELSE\ T\ END$

$[ANY\ X\ WHERE\ P\ THEN\ S\ END]R \iff \forall X.(P \Rightarrow [S]R)$

$LET\ x1, \dots, xn\ BE\ x1 = E1 \wedge \dots \wedge xn = En\ IN\ S\ END =$
 $ANY\ x1, \dots, xn\ WHERE\ x1 = E1 \wedge \dots \wedge xn = En\ THEN\ S\ END$

$X : \in E = ANY\ Y\ WHERE\ Y \in E\ THEN\ X := Y\ END$

$X : (P) = ANY\ Y\ WHERE\ [X := Y]P\ THEN\ X := Y\ END$

$[VAR\ X\ IN\ S\ END]P \iff \forall X.[S]P$

$$[S; T]P \iff [S][T]P$$

$$[R \leftarrow op(E)]P \iff [X := E][Y \leftarrow op(X)][R := Y]P$$

$$\begin{aligned} & [G; \text{WHILE } P \text{ DO } H \text{ INVARIANT } I \text{ VARIANT } E \text{ END}] Q \iff \\ & ([G]I) \wedge \\ & (I \wedge \neg P \Rightarrow Q) \wedge \\ & (I \wedge P \Rightarrow E \in \mathbb{N}) \wedge \\ & (I \wedge P \Rightarrow [H]I) \wedge \\ & (I \wedge P \Rightarrow [y := E][H]E < y) \end{aligned}$$