Semantics

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Abstract

1 Eval Simulation rules

$$\frac{S \vdash op : S' \qquad S' \vdash ops : S''}{S \vdash op, ops : S''} \text{ Script} \qquad \frac{S\{stack = v1 : ss\} \qquad S' = S\{stack = v1 : v1 : ss\}}{S \vdash DUP : S'} \text{ Dup}$$

$$\frac{S\{stack = ss, vp = i\} \qquad S\{stack = ss + +[V_i], vp = i + 1\} \vdash op : S'}{S \vdash op : S'} \text{ VirtualStack}$$

$$\frac{\begin{array}{c} S\{stack = v1 : v2 : ss, constrs = c\} \\ S' = S\{stack = ss, constrs = c \ \&\& \ v1 \ == \ v2\} \end{array}}{S \vdash EQUAL : S'} (==) \qquad \frac{\begin{array}{c} S\{stack = ss\} \\ S' = S\{stack = data : ss\} \end{array}}{S \vdash PUSH\_DATA \ data : S'} \text{ Push}$$

2 Solver rules

$$\frac{\Gamma \vdash c1 \qquad \Gamma \vdash c2}{\Gamma \vdash c1 \ \&\& \ c2} \text{ and} \qquad \frac{\Gamma \vdash c1}{\Gamma \vdash c1 \ || \ c2} \text{ or(1)} \qquad \frac{\Gamma \vdash c2}{\Gamma \vdash c1 \ || \ c2} \text{ or(2)} \qquad \frac{\Gamma \vdash e : 0 \times |1|}{\Gamma \vdash \neg e : 1 \times |1|} \text{ not}$$

$$\frac{\begin{array}{c} \Gamma \vdash e_1 : t_1@\{l_1 - h_1 \times |L_1 - H_1|\} \\ \Gamma \vdash e_2 : t_2@\{l_2 - h_2 \times |L_2 - H_2|\} \\ H_1 <= 4 \\ H_2 <= 4 \\ h_1 < h_2 \\ l_2 > l_1 \end{array}}{\Gamma \vdash e_1 < e_2 : 1 \times |1|} (<) \qquad \frac{\begin{array}{c} \Gamma \vdash e : l - h \times |L - H| \\ l <= l' \\ h >= h' \\ L <= L' \\ H >= H' \\ l' <= h' \\ L' <= H' \end{array}}{\Gamma \vdash e : l' - h' \times |L' - H'|} \text{ Restriction} \qquad \frac{(V_i \mapsto t) \in \Gamma}{\Gamma \vdash V_i : t} \text{ Var store}$$