Instruction Graph Statics

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1 Validity

$$\frac{(vs,\ U)\ \texttt{defined} \qquad (vs,\ \emptyset,\ s,\ U)\ \texttt{connected}}{\mathbf{P}(vs,\ s)\ \texttt{valid}}$$

2 Defined

$$\frac{}{(\mathbf{S}(\mathbf{V}(n,\ c)),\ \{n\})\ \texttt{defined}} \qquad \frac{(vs,\ U)\ \texttt{defined} \qquad n \notin U}{(\mathbf{V}(n,\ c)\ ::\ vs,\ U \cup \{n\})\ \texttt{defined}}$$

3 Connected

$$\frac{n \in U_v}{(vs,\ U_v,\ n,\ \emptyset)\ \texttt{connected}} \qquad \frac{\mathbf{V}(n,\ \mathbf{end}) \in vs \qquad n \notin U_v}{(vs,\ U_v,\ n,\ \{n\})\ \texttt{connected}}$$

$$\frac{\begin{array}{c}\mathbf{V}(n,\ \mathbf{do}\ a\ \mathbf{then}\ n') \in vs \\ (vs,\ U_v \cup \{n\},\ n',\ U)\ \texttt{connected} \qquad n \notin U_v\end{array}}{(vs,\ U_v,\ n,\ U \cup \{n\})\ \texttt{connected}}$$

$$\frac{\begin{array}{c}\mathbf{V}(n,\ \mathbf{do}\ a\ \mathbf{until}\ cnd\ \mathbf{then}\ n') \in vs \\ (vs,\ U_v \cup \{n\},\ n',\ U)\ \texttt{connected} \qquad n \notin U_v\end{array}}{(vs,\ U_v,\ n,\ U \cup \{n\})\ \texttt{connected}}$$

$$\frac{\begin{array}{c}\mathbf{V}(n,\ \mathbf{if}\ cnd\ \mathbf{then}\ n'\ \mathbf{else}\ n'') \in vs \qquad (vs,\ U_v \cup \{n\},\ n',\ U)\ \texttt{connected} \\ (vs,\ U_v \cup U \cup \{n\},\ n'',\ U')\ \texttt{connected} \qquad n \notin U_v\end{array}}{(vs,\ U_v,\ n,\ U \cup \{n\})\ \texttt{connected}}$$

$$\frac{\mathbf{V}(n,\ \mathbf{goto}\ n') \in vs \qquad (vs,\ U_v \cup \{n\},\ n',\ U)\ \texttt{connected} \qquad n \notin U_v}{(vs,\ U_v,\ n,\ U \cup \{n\})\ \texttt{connected}}$$