

CS421 HW10

Weiyang Pan - pan30

(Teamed with Yifang Zhang – zhang303)

Problem 1.

a. if B then C fi :

$$\frac{(B,m) \Downarrow \text{true} \quad (C,m) \Downarrow m'}{(if\ B\ then\ C\ fi,\ m) \Downarrow m'}$$

$$\frac{(B,m) \Downarrow \text{false}}{(if\ B\ then\ C\ fi,\ m) \Downarrow m}$$

do C while B od :

$$\frac{(B,m') \Downarrow \text{false} \quad (C,m) \Downarrow m'}{(do\ C\ while\ B\ od,\ m) \Downarrow m'}$$

$$\frac{(B,m') \Downarrow \text{true} \quad (C,m) \Downarrow m' \quad (do\ C\ while\ B\ od,\ m') \Downarrow m''}{(do\ C\ while\ B\ od,\ m) \Downarrow m''}$$

b. if B then C fi :

$$(if\ \text{true}\ then\ C\ fi,\ m) \rightarrow (C,\ m)$$

$$(if\ \text{false}\ then\ C\ fi,\ m) \rightarrow m$$

$$(B,\ m) \rightarrow (B',\ m)$$

$$(if\ B\ then\ C\ fi,\ m) \rightarrow (C\ if\ B'\ then\ C\ fi,\ m)$$

do C while B od :

$$(do\ C\ while\ B\ od,\ m) \rightarrow (C;\ if\ B\ then\ (do\ C\ while\ B\ od,\ m)\ else\ skip\ fi,\ m)$$