⑦ $\underbrace{x := 1;}_{A}$ $\underbrace{\text{if } \neg(y = x) \text{ then } y := x + x; z := y}_{C_1;\ C_2}$ $\underbrace{\text{else } z := x * x;}_{D_1}$ } Prog

interpretação semântica denotacional

$\rightarrow Sds[\![Prog]\!]$

$= Sds[\![A;\ \text{if } b \text{ then } C_1; C_2 \text{ else } D_1]\!]\ s$

$= Sds[\![\text{if } b \text{ then } C_1; C_2 \text{ else } D_1]\!] \circ Sds[\![A]\!]\ s$

$= \text{cond}(B[\![b]\!], Sds[\![C_1; C_2]\!], Sds[\![D]\!]) \circ Sds[\![A]\!]\ s$

$= \text{cond}(B[\![b]\!], Sds[\![C_1; C_2]\!], Sds[\![D_1]\!]), s[x \mapsto 1]$

$= \begin{cases} Sds[\![C_1; C_2]\!]\ s_1 & \text{se } B[\![b]\!]\ s_1 = tt \\ Sds[\![D_1]\!]\ s_1 & \text{se } B[\![b]\!]\ s_1 = ff \end{cases}$ ($s_1 = s[x \mapsto 1]$)

$= \begin{cases} s_1[y \mapsto A[\![x+x]\!]\ s_1][z \mapsto A[\![y]\!]\ s_2] & \text{se } B[\![b]\!]\ s_1 = tt \\ s_1[z \mapsto A[\![x*x]\!]\ s_1] & \text{se } B[\![b]\!]\ s_1 = ff \end{cases}$ ($s_2 = s_1[y \mapsto A[\![x+x]\!]\ s_1]$)

$= \begin{cases} s[x \mapsto 1][y \mapsto 2][z \mapsto 2] & \text{se } \neg(s_1\ x = s_1\ y) \\ s[x \mapsto 1][z \mapsto 1] & \text{se } s_1\ x = s_1\ y \end{cases}$ ($s_1\ x = 1$, $s_1\ y = 2$)

$= \begin{cases} s[x \mapsto 1][y \mapsto 2][z \mapsto 2] & \text{se } s\ y \neq 1 \\ s[x \mapsto 1][z \mapsto 1] & \text{se } s\ y = 1 \end{cases}$