Przykładowe obliczenie w modelu podstawieniowym dla języka Racket (dla porównania)

`(let* ([inc (λ (n) (+ n 1))] [twice (λ (f x) (f (f x)))]) (twice inc 2))` $\equiv$

$\equiv$ `(let ([inc (λ (n) (+ n 1))]) (let ([twice (λ (f x) (f (f x)))]) (twice inc 2)))` $\equiv$

$\equiv$ `(let ([twice (λ (f x) (f (f x)))]) (twice (λ (n) (+ n 1)) 2))` $\equiv$

$\equiv$ `((λ (f x) (f (f x))) (λ (n) (+ n 1)) 2)` $\equiv$

$\equiv$ `((λ (n) (+ n 1)) ((λ (n) (+ n 1)) 2))` $\equiv$

$\equiv$ `((λ (n) (+ n 1)) (+ 2 1))` $\equiv$

$\equiv$ `((λ (n) (+ n 1)) 3)` $\equiv$

$\equiv$ `(+ 3 1)` $\equiv$

$\equiv$ `4`

Przykładowe krótsze obliczenie w rachunku z domknięciami dla języka Racket

$\langle$`x, b,` $e\rangle$ będzie oznaczać domknięcie ze zmienną `x`, ciałem `b` i środowiskiem e.

[] będzie oznaczać puste środowisko (a właściwie wbudowane, ponieważ zakładamy dostępność procedur wbudowanych).

`(let ([inc (λ (n) (+ n 1))]) (λ (x) (inc (inc x))))[]` $\equiv$

$\equiv$ `(let ([inc ⟨n,(+ n 1),[]⟩]) (λ (x) (inc (inc x))))[]` $\equiv$

$\equiv$ `(λ (x) (inc (inc x)))[inc` $:=$ `⟨n,(+ n 1),[]⟩]` $\equiv$

$\equiv$ `⟨x, (inc (inc x)),[inc` $:=$ `⟨n,(+ n 1),[]⟩]⟩`

Przykładowe dłuższe obliczenie w rachunku z domknięciami dla języka Racket

Wartości zapisane są innym krojem pisma niż kod.

$$\texttt{(let* ([inc (}\lambda\texttt{ (n) (+ n 1))] [twice (}\lambda\texttt{ (f x) (f (f x)))]) (twice inc 2))[]} \equiv$$

$$\equiv \texttt{(let ([inc (}\lambda\texttt{ (n) (+ n 1))]) (let ([twice (}\lambda\texttt{ (f x) (f (f x)))]) (twice inc 2)))[]} \equiv$$

$$\equiv \texttt{(let ([inc }\langle\texttt{n,(+ n 1),[]}\rangle\texttt{]) (let ([twice (}\lambda\texttt{ (f x) (f (f x)))]) (twice inc 2)))[]} \equiv$$

$$\equiv \texttt{(let ([twice (}\lambda\texttt{ (f x) (f (f x)))]) (twice inc 2))[inc :=}\ \langle\texttt{n,(+ n 1),[]}\rangle] \equiv$$

$$\equiv \texttt{(let ([twice }\langle\texttt{f x,(f (f x)),[inc :=} \ldots\texttt{]}\rangle\texttt{]) (twice inc 2))[inc :=}\ \langle\texttt{n,(+ n 1),[]}\rangle] \equiv$$

$$\equiv \texttt{(twice inc 2)[twice :=}\ \langle\texttt{f x,(f (f x)),[inc :=} \ldots\texttt{]}\rangle\texttt{, inc :=}\ \langle\texttt{n,(+ n 1),[]}\rangle] \equiv$$

$$\equiv (\langle\texttt{f x,(f (f x)),[inc :=} \ldots\texttt{]}\rangle\ \texttt{inc 2})\texttt{[twice :=}\ \langle\texttt{f x,(f (f x)),[inc :=} \ldots\texttt{]}\rangle\texttt{, inc :=}\ \langle\texttt{n,(+ n 1),[]}\rangle] \equiv$$

$$\equiv (\langle\texttt{f x,(f (f x)),[inc :=} \ldots\texttt{]}\rangle\ \langle\texttt{n,(+ n 1),[]}\rangle\ \texttt{2})\texttt{[twice :=}\ \langle\texttt{f x,(f (f x)),[inc :=} \ldots\texttt{]}\rangle\texttt{, inc :=}\ \langle\texttt{n,(+ n 1),[]}\rangle] \equiv$$

$$\equiv (\langle\texttt{f x,(f (f x)),[inc :=} \ldots\texttt{]}\rangle\ \langle\texttt{n,(+ n 1),[]}\rangle\ \texttt{2})\texttt{[twice :=}\ \langle\texttt{f x,(f (f x)),[inc :=} \ldots\texttt{]}\rangle\texttt{, inc :=}\ \langle\texttt{n,(+ n 1),[]}\rangle] \equiv$$

$$\equiv \texttt{(f (f x))[f :=}\ \langle\texttt{n,(+ n 1),[]}\rangle\texttt{, x := 2, inc :=}\ \langle\texttt{n,(+ n 1),[]}\rangle] \equiv$$

$$\equiv (\langle\texttt{n,(+ n 1),[]}\rangle\ \texttt{(f x))[f :=}\ \langle\texttt{n,(+ n 1),[]}\rangle\texttt{, x := 2, inc :=}\ \langle\texttt{n,(+ n 1),[]}\rangle] \equiv$$

$$\equiv (\langle\texttt{n,(+ n 1),[]}\rangle\ (\langle\texttt{n,(+ n 1),[]}\rangle\ \texttt{x))[f :=}\ \langle\texttt{n,(+ n 1),[]}\rangle\texttt{, x := 2, inc :=}\ \langle\texttt{n,(+ n 1),[]}\rangle] \equiv$$

$$\equiv (\langle\texttt{n,(+ n 1),[]}\rangle\ (\langle\texttt{n,(+ n 1),[]}\rangle\ \texttt{2))[f :=}\ \langle\texttt{n,(+ n 1),[]}\rangle\texttt{, x := 2, inc :=}\ \langle\texttt{n,(+ n 1),[]}\rangle] \equiv$$

$$\equiv (\langle\texttt{n,(+ n 1),[]}\rangle\ \texttt{(+ n 1)[n := 2])[f :=}\ \langle\texttt{n,(+ n 1),[]}\rangle\texttt{, x := 2, inc :=}\ \langle\texttt{n,(+ n 1),[]}\rangle] \equiv$$

$$\equiv (\langle\texttt{n,(+ n 1),[]}\rangle\ \texttt{(+ n 1)[n := 2])[f :=}\ \langle\texttt{n,(+ n 1),[]}\rangle\texttt{, x := 2, inc :=}\ \langle\texttt{n,(+ n 1),[]}\rangle] \equiv$$

$$\equiv (\langle\texttt{n,(+ n 1),[]}\rangle\ \texttt{(+ 2 1)[n := 2])[f :=}\ \langle\texttt{n,(+ n 1),[]}\rangle\texttt{, x := 2, inc :=}\ \langle\texttt{n,(+ n 1),[]}\rangle] \equiv$$

$$\equiv (\langle\texttt{n,(+ n 1),[]}\rangle\ \texttt{(+ 2 1)[n := 2])[f :=}\ \langle\texttt{n,(+ n 1),[]}\rangle\texttt{, x := 2, inc :=}\ \langle\texttt{n,(+ n 1),[]}\rangle] \equiv$$

$$\equiv (\langle\texttt{n,(+ n 1),[]}\rangle\ \texttt{3)[f :=}\ \langle\texttt{n,(+ n 1),[]}\rangle\texttt{, x := 2, inc :=}\ \langle\texttt{n,(+ n 1),[]}\rangle] \equiv$$

$$\equiv \texttt{(+ n 1)[n := 3]} \equiv \texttt{(+ n 1)[n := 3]} \equiv \texttt{(+ 3 1)[n := 3]} \equiv \texttt{(+ 3 1)[n := 3]} \equiv 4$$