Lenguajes de Programación Tarea III

Andrea Itzel González Vargas Karla Esquivel Guzmán Carlos Gerardo Acosta Hernández

Facultad de Ciencias UNAM

Problema I

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\Gamma [x \leftarrow number], [fib (number \rightarrow number)] \vdash (- x 1) : number \sqrt{\phantom{a}}
                           \Gamma [x \leftarrow number], [fib (number \rightarrow number)] \vdash (-x2): number \sqrt{\phantom{a}}
                            \Gamma [x \leftarrow number] \vdash x : number \Gamma [x \leftarrow number] \vdash 1 : number \sqrt{}
                                                 \Gamma [x \leftarrow number] \vdash (fib (-x 1)) : number
                                                 \Gamma [x \leftarrow number] \vdash (fib (-x 2)) : number
                                                       \Gamma [x \leftarrow number] \vdash x : number \sqrt{}
                                                        \Gamma [x \leftarrow number] \vdash 0 : number \sqrt{}
                          \Gamma [x \leftarrow number] \vdash (= x \ 1) : bool \ \Gamma [x \leftarrow number] \vdash 1 : number \ \sqrt{}
                                  \Gamma [x \leftarrow number] \vdash (+ (fib (-x 1)) (fib (-x 2))) : number
                                                    \Gamma [x \leftarrow number] \vdash (= x \ 0) : boolean
                                                        \Gamma [x \leftarrow number] \vdash 0 : number \sqrt{}
                       \Gamma [x \leftrightarrow number] \vdash (if (= x 1) 1 (+ (fib (- x 1) fib (- x 2)))) : number
           \Gamma [x \leftarrow number] \vdash (if (= x 0) 0 (if (= x 1) 1 (+ (fib (- x 1) fib (- x 2))))) : number
\Gamma \vdash \text{fib } (x : \text{number}) : \text{number } (\text{if } (=x\ 0)\ 0\ (\text{if } (=x\ 1)\ 1\ (+\ (\text{fib } (-x\ 1)\ \text{fib } (-x\ 2))))) : (\text{number } (-x\ 1)\ \text{fib } (-x\ 2))))) : (\text{number } (-x\ 1)\ \text{fib } (-x\ 2))))) : (\text{number } (-x\ 1)\ \text{fib } (-x\ 2)))))
                                                                          \rightarrow number)
                                                 \Gamma \vdash \text{empty}?: (list \rightarrow \text{bool}) \Gamma \vdash l: list \sqrt{\phantom{a}}
                                                                  \Gamma \vdash (\text{empty? l}) : \text{bool}
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Problema II

$$\boxed{1} (+ \boxed{2} \ 1 \boxed{3} (\text{first } \boxed{4} (\text{cons } \boxed{5} \text{ true } \boxed{6} \text{ empty})))$$

Retricciones

- $\begin{bmatrix} 1 \end{bmatrix}$ = number si $\begin{bmatrix} 2 \end{bmatrix}$ = $\begin{bmatrix} 3 \end{bmatrix}$ = number
- [[2]] = number
- $[\overline{ [3] }]$ = number si $[\overline{ [4] }]$ = nlist
- $\begin{bmatrix} \boxed{4} \end{bmatrix}$ = nlist si $\begin{bmatrix} \boxed{5} \end{bmatrix}$ = number y $\begin{bmatrix} \boxed{6} \end{bmatrix}$ = nlist
- [5] = number si [5] contiene un numeral, pero [5] = boolean!!

Por lo tanto esta mal formado el programa

Problema III

Acción	Stack	Sustitución
Inicio	$[\llbracket 1 \rrbracket] = [\llbracket f \rrbracket] \to [\llbracket 2 \rrbracket]$	Vacio
	$\left[\begin{bmatrix} \boxed{2} \end{bmatrix} \right] = \left[\begin{bmatrix} \mathbf{x} \end{bmatrix} \right] \to \left[\begin{bmatrix} \boxed{3} \end{bmatrix} \right]$	
	$\left[\begin{bmatrix} 3 \end{bmatrix} \right] = \left[\begin{bmatrix} y \end{bmatrix} \right] \rightarrow \left[\begin{bmatrix} 4 \end{bmatrix} \right]$	
	$[[\cos s]] = [\llbracket x \rrbracket] \times [\llbracket 5 \rrbracket] \rightarrow [\llbracket 4 \rrbracket]$	
	$\left[[f] \right] = \left[\underbrace{ \left[6 \right] } \right] \rightarrow \underbrace{ \left[\left[5 \right] \right] }$	
	$[[\mathbf{f}]] = [[\mathbf{y}]] \to [[\underline{6}]]$	
Paso 3	$\begin{bmatrix} \begin{bmatrix} 2 \end{bmatrix} \end{bmatrix} = \begin{bmatrix} \begin{bmatrix} x \end{bmatrix} \end{bmatrix} \rightarrow \begin{bmatrix} \begin{bmatrix} 3 \end{bmatrix} \end{bmatrix}$	$\left \begin{array}{c} [[\underline{1} \underline{]}] \mapsto [[\underline{f}] \end{array} \right \rightarrow \left[\underline{[} \underline{2} \underline{]} \right]$
	$\begin{bmatrix} \begin{bmatrix} 3 \end{bmatrix} \end{bmatrix} = \begin{bmatrix} \begin{bmatrix} y \end{bmatrix} \end{bmatrix} \rightarrow \begin{bmatrix} \begin{bmatrix} 4 \end{bmatrix} \end{bmatrix}$	
	$[[\cos s]] = [[x]] \times [[5]] \rightarrow [[4]]$	
	$[[f]] = [[6]] \rightarrow [[5]]$	
	$[[f]] = [[y]] \rightarrow [[6]]$	rd ha rroa rd h
Paso 3		$\left[\begin{bmatrix} 1 \\ \end{bmatrix} \right] \mapsto \left[\begin{bmatrix} f \\ \end{bmatrix} \right] \rightarrow \left[\begin{bmatrix} 2 \\ \end{bmatrix} \right]$
	$[[\cos s]] = [[x]] \times [[5]] \rightarrow [[4]]$	$\left \left[\left[2 \right] \right] \mapsto \left[\left[x \right] \right] \rightarrow \left[\left[3 \right] \right] \right $
	$[[f]] = [[6]] \rightarrow [[5]]$	
	$[[f]] = [[y]] \rightarrow [[6]]$	rd - h1
Paso 3	$[[\text{cons}]] = [[\text{x}]] \times [[\underline{[5]}]] \rightarrow [[\underline{[4]}]] = \text{number} \times \text{list} \rightarrow \text{list}$	$\left[\left[\left[\frac{1}{1} \right] \right] \mapsto \left[\left[f \right] \right] \rightarrow \left[\left[x \right] \right] \rightarrow \left[\left[y \right] \right] \right]$
	ן ונפו נופה , נופה	$ \rightarrow [\boxed{4}] $
	$[[f]] = [\underline{[6]}] \rightarrow [\underline{[5]}]$	$\left[\begin{bmatrix} 2 \end{bmatrix} \right] \mapsto \left[\begin{bmatrix} x \end{bmatrix} \right] \rightarrow \left[\begin{bmatrix} y \end{bmatrix} \right] \rightarrow \left[\begin{bmatrix} 4 \end{bmatrix} \right]$
	$[[f]] = [[y]] \rightarrow [[\boxed{6}]]$	$\left \begin{array}{c} [3] \end{array} \right \mapsto [[y]] \to [\boxed{4}] $

Paso 5	[[x]] = number	$ \begin{array}{c} [\boxed{1}]] \mapsto [[f]] \to [[x]] \to [[y]] \\ \to [\boxed{4}]] \end{array} $
	$\begin{bmatrix} \boxed{5} \end{bmatrix} = \text{list}$	$\left \begin{array}{c} [2] \\ [2] \end{array} \right \mapsto [[x]] \to [[y]] \to [4] $
		$\left[\left[\boxed{3} \right] \right] \mapsto \left[\left[y \right] \right] \rightarrow \left[\left[\boxed{4} \right] \right]$
	$[[f]] = [[y]] \rightarrow [[6]]$	
Paso 3	$\left[\left[5 \right] \right] = \text{list}$	$ \begin{array}{c} [[1]] \mapsto [[f]] \to \text{ number } \to \\ [[y]] \to [[4]] \end{array} $
	$[\boxed{4}] = list$	$\begin{bmatrix} \begin{bmatrix} y \end{bmatrix} \end{bmatrix} \begin{bmatrix} \begin{bmatrix} y \end{bmatrix} \end{bmatrix} \text{number} \begin{bmatrix} [y] \end{bmatrix} \begin{bmatrix} \begin{bmatrix} y \end{bmatrix} \end{bmatrix}$
	$[[f]] = [[6]] \rightarrow [[5]]$	$[[3]] \mapsto [[y]] \rightarrow [[4]]$
Paso 3	$[[f]] = [[y]] \rightarrow [[6]]$	$[[x]] \mapsto \text{number}$
Paso 5	$\left[\left[\boxed{4} \right] \right] = \text{list}$	$ \begin{array}{c} [[1]] \mapsto [[f]] \to \text{number} \to \\ [[y]] \to [[4]] \end{array} $
	$[[f]] = [\overline{[6]}] \to \text{list}$	$\begin{bmatrix} \begin{bmatrix} y \end{bmatrix} \end{bmatrix} \begin{bmatrix} \begin{bmatrix} y \end{bmatrix} \end{bmatrix} \text{number} \rightarrow \begin{bmatrix} \begin{bmatrix} y \end{bmatrix} \end{bmatrix} \rightarrow \begin{bmatrix} \begin{bmatrix} 4 \end{bmatrix} \end{bmatrix}$
	$[[f]] = [[y]] \rightarrow [[6]]$	$[[3]] \mapsto [[y]] \rightarrow [[4]]$
		$[[x]] \mapsto \text{number}$
D 4	ונפו ולכלו , ו:	$[[5]] \mapsto \text{list}$
Paso 4	$[[f]] = [[6]] \to \text{list}$	$ \begin{array}{c} [[\underline{1}]] \mapsto [[f]] \to \text{number} \to \\ [[y]] \to \text{list} \end{array} $
	$[[f]] = [[y]] \rightarrow [\boxed{6}]$	$\begin{bmatrix} \begin{bmatrix} 1 \\ 2 \end{bmatrix} \end{bmatrix} \mapsto \text{number} \to \begin{bmatrix} \begin{bmatrix} y \end{bmatrix} \end{bmatrix} \to \begin{bmatrix} \begin{bmatrix} y \end{bmatrix} \end{bmatrix}$
		$ \begin{array}{c} \operatorname{list} \\ [[3]] \mapsto [[y]] \to \operatorname{list} \end{array} $
		$\begin{bmatrix} [[x]] \mapsto \text{number} \end{bmatrix}$
		$\left[\left[\left[5\right]\right]\right] \mapsto \text{list}$
		$[[4]] \mapsto \text{list}$
Paso 3	$\left \begin{array}{c} [\underline{[6]}] \rightarrow \text{list} = [[y]] \rightarrow [\underline{[6]}] \end{array} \right $	$ \begin{array}{cccc} $
		$\begin{array}{c} \text{number} \to [[y]] \to \text{list} \\ \end{array}$
		$\begin{bmatrix} [\underline{[2]}] \mapsto \text{number} \to [[y]] \to \\ \text{list} \end{bmatrix}$
		$ \begin{array}{c} \operatorname{list} \\ [[3]] \mapsto [[y]] \to \operatorname{list} \end{array} $
		$\begin{bmatrix} [[x]] \mapsto \text{number} \end{bmatrix}$
		$[[5]] \mapsto \text{list}$
		$ \begin{array}{c} [\boxed{4}] \mapsto \text{list} \\ [[f]] \mapsto [\boxed{6}] \to \text{list} \end{array} $
Paso 5	[[6]] = [[y]]	$[[1]] \mapsto [[6]] \rightarrow \text{list} \rightarrow$
	l	$ \begin{array}{c} \text{number} \to [\boxed{6}]] \to \text{list} \\ \text{formula} $
	$ \text{list} = [[\underline{6}]] $	$\begin{bmatrix} \begin{bmatrix} 2 \end{bmatrix} \end{bmatrix} \mapsto \text{number} \to \begin{bmatrix} \begin{bmatrix} 6 \end{bmatrix} \end{bmatrix} \to \begin{bmatrix} \\ \end{bmatrix}$
		1100

1		[[2]]] [[_v]] ligt
		$\left[\left[\begin{array}{c} 3 \\ \end{array} \right] \right] \mapsto \left[\left[y \right] \right] \to \text{list}$
		$[[x]] \mapsto \text{number}$
		$\left[\left[\underbrace{5}\right]\right] \mapsto \text{list}$
		$\left \begin{bmatrix} 4 \end{bmatrix} \right \mapsto \text{list}$
		$[[f]] \mapsto [[6]] \rightarrow \text{list}$
Paso 4	list = [[6]]	$[[1]] \mapsto [[6]] \rightarrow \text{list} \rightarrow$
		$ \text{ number } \rightarrow [\llbracket \boxed{6} \rrbracket] \rightarrow \text{list}$
		$\left \begin{array}{c} [2] \end{array} \right \mapsto \text{number} \to [\boxed{6}] \to \left \begin{array}{c} \end{array} \right $
		list
		$[[3]] \mapsto [[6]] \to \text{list}$
		$[[x]] \mapsto \text{number}$
		$[[5]] \mapsto \text{list}$
		$\left[\left[\boxed{4} \right] \right] \mapsto \operatorname{list}$
		$[[\overline{\mathbf{f}}]] \mapsto [[\overline{6}]] \to \text{list}$
		$[[y]] \mapsto [\overline{[6]}]$
Paso 4	Vacio	$ [[1]] \mapsto \text{list} \to \text{number} \to $
		$list \rightarrow list$
		$[[2]] \mapsto \text{number} \rightarrow \text{list} \rightarrow [$
		list
		$[[3]] \mapsto \text{list} \to \text{list}$
		$[[x]] \mapsto \text{number}$
		$[[5]] \mapsto \text{list}$
		$[[\overline{4}]] \mapsto \text{list}$
		$[[f]] \mapsto \text{list} \to \text{list}$
		$[[y]] \mapsto \text{list}$
		$[[7]] \mapsto \text{list}$

Problema IV