Solution to Homework 2
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Problem 1

(*1*) $\rho_4 \rightarrow \{z \rightarrow 4, plus\_x \rightarrow < fun\ y \rightarrow x + y, x \rightarrow 2 >, x \rightarrow 2\}$
(*2*) $\rho_6 \rightarrow \{y \rightarrow 0,\ sub\_z \rightarrow < fun\ x \rightarrow y - z + x, \rho_4 >\}\ +\ \rho_4$
(*3*) $\rho_7 \rightarrow \{f\_z \rightarrow < fun\ x \rightarrow if\ plus\_x\ x < z\ then\ plus\_x\ z\ else\ sub\_z\ x,\ \rho_6\}\ +\ \rho_6$

Problem 2

$Eval(f\_z\ x, \rho_6) =$
$Eval(app\ < x \rightarrow if\ plus\_x\ x < z\ then\ plus\_x\ z\ else\ sub\_z\ x, \rho_6 > (x), \rho_6) =$
$Eval(app\ < x \rightarrow if\ plus\_x\ ... > (2), \rho_6) =$
$Eval(app\ < x \rightarrow if\ 2 < 4\ then\ plus\_x\ 4\ else\ sub\_z\ 2, \rho_6 > (2), \rho_6) =$
$Eval(plus_x \rightarrow < fun\ y \rightarrow x + y, \{x \rightarrow 2\} >, (2), \rho_6) =$
$Eval(x + y, \{x \rightarrow 2, y \rightarrow 2\} + \{x \rightarrow 2\}) =$
$Eval(2 + 2, \{x \rightarrow 2, y \rightarrow 2\} + \{x \rightarrow 2\}) = 4$