[A]	$X_1 \leftarrow X_1 - 1$	(I_1)
	$X_2 \leftarrow X_2 - 1$	(I_2)
	If $X_1 \neq 0$ GOTO B	(I_3)
	$Y \leftarrow Y + 1$	(I_4)
	GOTO E	(I_5)
[B]	If $X_2 \neq 0$ GOTO A	(I_6)
	GOTO E	(I_7)

$\#X_1 = 2, \#X_2 = 4, \#Y = 1, \#A = 1, \#B = 2, \#E = 5$

Note: $<x, y> = 2^x (2y + 1) - 1$

$\#(I_1) =$ is $<a, <b, c>> = <1, <2, 1> = <1, 11> = 45$

$\#(I_3) = <0, <4, 1> = <0, 47> = 94$

Given $\#(I_3) = 94$ find a, b, c, values

$x = l(z) =$ largest number such that $2^x \mid z + 1$
$y = r(z) =$ solution of $2y + 1 = (z+ 1) / 2^x$

$a = l(94) = 0, <b, c> = r(94) = 47$

$b = l(47) = 4, c = r(47) = 1$

a = 0 implies instruction is unlabeled.

$c = 1$ implies variable is $c + 1 = r(r(94)) + 1 = 2 = X_1$

$b = 4$ implies label is $b - 2 = l(r(94)) - 2 = 4 - 2 = B$

$\#(I_2) = <0, <2, 3> = <0, 27> = 54$

$\#(I_4) = <0, <1, 0> = <0, 1> = 2$

We will consider the program $\mathscr{P}$ consisting of the 4 instructions computed above.

$\#\mathscr{P} = [\#(I_1), \#(I_2), ,\#(I_3), ,\#(I_4)] -1 = [45, 54, 94, 2] -1 = 2^{45} \times 3^{54} \times 5^{94} \times 7^2 - 1$

We consider $\mathscr{U}_2$ that computes $\Phi^{(2)}(X_1, X_2, X_3)$ where X_3 is $\#\mathscr{P}$ above.

$Z \leftarrow X_3 + 1$ Hence $Z = \#\mathscr{P} + 1 = [\#(I_1), \#(I_2), ,\#(I_3), ,\#(I_4)] = 2^{45} \times 3^{54} \times 5^{94} \times 7^2$

$S \leftarrow \prod(i=1 \text{ to } 2)\ (p_{2i})^{X_i}$ Hence $S = 3^{X1} \times 7^{X2} = [0, X_1, 0, X_2]$ which is the initialization of input values. Not that the value of all other variables (including Y) is initially 0 and the value of Y is obtained by the exponent of 2 in the product S.

$K \leftarrow 1$