Tutorial 3

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1) Initially only P_0 can go inside
the while loop so $S_0 = 1$, $S_2 = 0$, $S_1 = 0$.

Minimum no of times 0 is printed
is twice when executed in order
$(p_0 \to p_1 \to p_2 \to p_0)$

Maximum no. of times 0 is printed
is thrice when executed in order
$(p_0 \to p_1 \to p_0 \to p_2 \to p_0)$

Ans process P_0 will print 0 atleast
twice.

Q2) Below is one case where x attains max value semaphore S is initialized to 2.

Process w executes $S=1$, $x=1$ but it doesent update the x variable.
The process Y executes $S=0$, it decrements x, now $x=2$ & signal semaphore $S=1$.
Now process z executes $S>0$, $x=+4$ signal semaphore $S=1$.
Now process w updates $x=1$ & $S=2$
Then process x executes $x=2$.
So,

Maximum possible value of x after all proces complete execution is 2.