$$\begin{aligned} \mathbf{x}_0 &= \emptyset \\ x_{1,1} \\ x_{1,2} \\ \vdots \\ x_{1, \cdot} \end{aligned} \end{aligned} \mathbf{x}_1 = \mathbf{x}_0 \cup \{x_{1,1}, \cdots, x_{1, \cdot}\}$$
 [observe $(t_1 \ \theta_{t_1}) \ y_1$]
$$\begin{aligned} x_{2,1} \\ x_{2,2} \\ \vdots \\ x_{2, \cdot} \end{aligned} \end{aligned} \mathbf{x}_2 = \mathbf{x}_1 \cup \{x_{2,1}, \cdots, x_{2, \cdot}\}$$
 where
$$t_{n,k} = \text{result of random procedure application } n, k \end{aligned}$$
 where
$$t_{n,k} = \text{type}$$

$$\theta_{t_{n,k}} = \text{args}$$

$$\begin{aligned} x_{n,1} \\ x_{n,2} \\ \vdots \\ x_{n, \cdot} \end{aligned} \end{aligned}$$
 [observe $(t_n \ \theta_{t_n}) \ y_n$]
$$\vdots \\ [\text{Observe } (t_n \ \theta_{t_n}) \ y_n \end{bmatrix}$$

$$\vdots \\ x_{N,1} \\ x_{N,2} \\ \vdots \\ x_{N, \cdot} \end{aligned} \end{aligned}$$

$$\begin{aligned} x_{N} &= \mathbf{x}_{N-1} \cup \{x_{N,1}, \cdots, x_{N, \cdot}\} \\ \vdots \\ x_{N, \cdot} \end{aligned}$$
 [observe $(t_N \ \theta_{t_N}) \ y_N$]