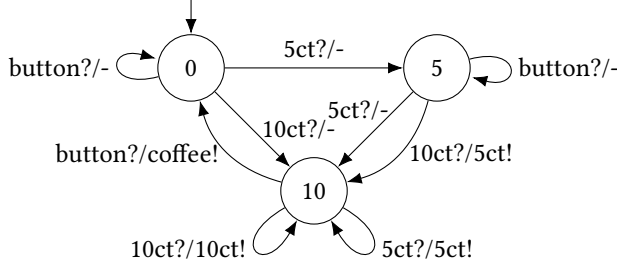# LEARNING A COFFEE MACHINE MODEL WITH $L^{\#}$

We show how the L^* algorithm learns the following Mealy machine:

L^* constructs an observation table by performing the steps below. For convenience, we abbreviate the inputs to 5, 10 and b, and the outputs to $-$, 5, 10 and c.

(1) The set $\mathcal{U}$ of prefixes is initialized to $\{\epsilon\}$ and the set $\mathcal{V}$ of suffixes to $\{5, 10, b\}$. The L^* algorithm then poses 12 output queries to fill the following table:

	5	10	b
ϵ	√	√	√
5	√	5	√
10	5	10	c
b	√	√	√

(2) Since the table is not closed, set $\mathcal{U}$ is extended to $\{\epsilon, 5, 10\}$. One letter extensions of the new prefixes are added as rows to the table, and the learner poses 18 output queries to fill the extended table:

	5	10	b
ϵ	√	√	√
5	√	5	√
10	5	10	c
b	√	√	√
5 5	5	10	c
5 10	5	10	c
5 b	√	5	√
10 5	5	10	c
10 10	5	10	c
10 b	√	√	√

(3) Since the resulting table is closed and consistent, the learner constructs an hypothesis, which is first-time-right: